



2026 Evolent Clinical Guidelines for Medical Necessity Review - HMSA

ADVANCED IMAGING & CARDIAC GUIDELINES

Effective April 1, 2026 – March 31, 2027

Guidelines for Clinical Review Determination

Preamble

Evolent is committed to the philosophy of supporting safe and effective treatment for patients. The medical necessity criteria that follow are guidelines for the provision of diagnostic imaging. These criteria are designed to guide both providers and reviewers to the most appropriate diagnostic tests based on a patient's unique circumstances. In all cases, clinical judgment consistent with the standards of good medical practice will be used when applying the guidelines. Determinations are made based on both the guideline and clinical information provided at the time of the request. It is expected that medical necessity decisions may change as new evidence-based information is provided or based on unique aspects of the patient's condition. The treating clinician has final authority and responsibility for treatment decisions regarding the care of the patient.

Guideline Development Process

These medical necessity criteria were developed by Evolent for the purpose of making clinical review determinations for requests for therapies and diagnostic procedures. The developers of the criteria sets included representatives from the disciplines of radiology, internal medicine, nursing, cardiology, and other specialty groups. Evolent's guidelines are reviewed yearly and modified when necessary following a literature search of pertinent and established clinical guidelines and accepted diagnostic imaging practices.

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Evolent Clinical Guideline 7263 for Cardiac Resynchronization Therapy

Guideline Number: Evolent_CG_7263	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

This guideline describes the medical necessity for cardiac resynchronization therapy (CRT). Indications for CRT for patients are based upon left ventricular (LV) ejection fraction (LVEF), QRS duration, New York Heart Association (NYHA) functional class (presence or absence of symptoms) and need for ventricular pacing regardless of etiology (ischemic or non-ischemic cardiomyopathy). ⁽¹⁾

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ⁽²⁻⁶⁾

INDICATIONS FOR CARDIAC RESYNCHRONIZATION THERAPY (CRT)

Cardiomyopathy

NOTE: The following indications only apply to patients:

- Who have been on guideline-directed medical therapy (GDMT) for 3 months or
- Who have been on GDMT and are 40 days after myocardial infarction (MI), or
- With implantation of pacing or defibrillation device for special indications (class indicates NYHA functional class)

Class I Through Class IV ^(1,7)

- Ischemic cardiomyopathy, LVEF $\leq 35\%$, QRS ≥ 150 ms, left bundle branch block (LBBB), Sinus Rhythm (**AUC Score 7-9**)
- Nonischemic cardiomyopathy, LVEF $\leq 35\%$, QRS ≥ 150 ms, LBBB, Sinus Rhythm (**AUC Score 7-9**)

Class II Through Class IV ^(1,7)

- Ischemic and non-ischemic cardiomyopathy, LVEF $\leq 35\%$, QRS 120-149 ms, LBBB, Sinus Rhythm (**AUC Score 7**)
- Ischemic and non-ischemic cardiomyopathy, LVEF $\leq 35\%$, QRS ≤ 150 ms, non-LBBB (**AUC score 6**)
- Nonobstructive hypertrophic cardiomyopathy (HCM), LVEF $< 50\%$, LBBB, CRT therapy for symptom reduction

Class III Through Class IV ^(1,8)

- Ischemic cardiomyopathy, LVEF $\leq 30\%$, QRS ≥ 150 ms, non-LBBB, Sinus Rhythm (**AUC Score 7**)
- Nonischemic cardiomyopathy, LVEF $\leq 35\%$, QRS ≥ 150 ms, non-LBBB, Sinus Rhythm (**AUC Score 7**)
- Ischemic and non-ischemic cardiomyopathy, LVEF 31-35%, QRS ≥ 150 ms, non-LBBB, Sinus Rhythm (**AUC Score 7**)

Special Circumstances when CRT ICD may be implanted after < 3 months GDMT

- Criteria are met, based on a pacing indication, for a non-elective implantable cardioverter defibrillator (ICD) or pacemaker and in the face of the low likelihood of improvement in symptoms and adequate recovery of LVEF, despite less than 3 months GDMT for heart failure or < 40 days post myocardial infarction or 3 months post revascularization, criteria for CRT are otherwise met. This avoids a second implantation procedure within less than 3 months ^(1,9)

Special Situations: Independent/Regardless of NYHA Heart Failure Class

- Patients with an indication for ventricular pacing, a LVEF $\leq 50\%$, and high degree atrioventricular (AV) block or are expected to be paced more than 40% of the time; this

includes patients with atrial fibrillation ^(1,8)

- Patients with Atrial fibrillation and LVEF $\leq 35\%$ who requires ventricular pacing or otherwise meets CRT criteria; **AND** AV nodal ablation or pharmacologic rate control will allow nearly 100% ventricular pacing with CRT ⁽⁷⁾
- For patients with atrial fibrillation and LVEF $\leq 50\%$, if a rhythm control strategy fails and ventricular rates remain rapid despite medical therapy, atrioventricular nodal ablation with implantation of a CRT device is reasonable ⁽⁷⁾
- As CRT has not been studied in transthyretin amyloid cardiomyopathy (ATTR-CM), those with heart failure with reduced ejection fraction (HFrEF) should follow guidelines for Class II-Class IV indications

Not Indicated

- NYHA class I or II and non-LBBB pattern with QRS duration < 150 ms, ⁽¹⁾except as in Special Situations section above
- NYHA class I through IV with QRS duration < 120 ms ⁽¹⁾
- Comorbidities and/or frailty expected to limit survival with good functional capacity to < 1 year ^(1,7)
- Active bloodstream infection
- Reversible causes are present such as toxic-, metabolic- or tachycardic-mediated cardiomyopathy, would require reassessment once the situation is corrected
- Cardiogenic shock or symptomatic hypotension while in stable baseline rhythm

Adult Congenital Heart Disease (CHD)

Class I Through Class IV

- Systemic ventricle with EF $\leq 35\%$, intrinsic narrow QRS complex, and undergoing new device placement or replacement with anticipated requirement for significant ($> 40\%$) ventricular pacing (**AUC Score 7-8**). ⁽¹⁰⁾
- Systemic ventricle with EF $> 35\%$, intrinsic narrow QRS complex, and undergoing new device placement or replacement with anticipated requirement for significant ($> 40\%$) ventricular pacing (**AUC Score 6**). ⁽¹⁰⁾
- Any CHD, regardless of specific ejection fraction, with progression of systolic systemic ventricular dysfunction and/or ventricular dilation, *and who are undergoing other cardiac surgery*, (particularly if thoracotomy is anticipated to be needed for LV pacing), with a QRS complex ≥ 150 ms (**AUC Score 6**) ⁽¹⁰⁾

Class II Through Class IV

- Systemic LVEF $\leq 35\%$, sinus rhythm and wide QRS complex ≥ 150 ms ⁽¹⁰⁾
- Any CHD, wide QRS complex ≥ 150 ms due to a complete RBBB, with a severe sub-pulmonary right ventricle (RV) dysfunction and dilatation despite interventions to

decrease RV volume overload ⁽¹⁰⁾

- Patients with single ventricle or systemic right ventricle with an LVEF $\leq$ 35% with QRS complexes $\geq$ 120 ms with either RBBB or LBBB morphology ⁽¹⁰⁾

Class IV

- Severe ventricular dysfunction, and would otherwise be candidates for heart transplantation or mechanical circulatory support ⁽¹⁰⁾

Not Indicated

- Patients whose co-morbidities and/or frailty limit survival with good functional capacity to < 1 year ⁽¹⁰⁾
- Patients with a narrow QRS complex (< 120 ms) without major electrical activation delay within the failing ventricle ⁽¹⁰⁾

CODING AND STANDARDS

Codes

33221, 33224, 33225, 33231, 33241, 33249

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

CRT, which paces the left and right ventricle in rapid sequence, also known as biventricular pacing, improves coordination of left ventricular contraction in the presence of a wide QRS complex in systolic heart failure, by simultaneously pacing the interventricular septum and the left lateral wall.

CRT improves cardiac function and quality of life, and it decreases cardiac events and mortality among appropriately chosen patients. In the proper patient population, improved survival in

patients with CRT can be greater than that provided by implantable cardioverter-defibrillator (ICD) insertion alone.

Guiding principles in the consideration of CRT:

- NYHA class is an important qualifying factor, with candidacy based on functional class, EF, and QRS duration.
- Bundle branch block or intraventricular conduction delay should be persistent, not rate related. ⁽¹⁾
- GDMT should have been in place continuously for at least 3 months after initiation of therapy for cardiomyopathy or 40 days post myocardial infarction to allow recovery of LVEF. This 3-month time period is “reset” if a revascularization is performed in the interim. Reversible causes (e.g., ischemia) should be excluded. ⁽⁷⁾
- The patient should have expected survival with a reasonably good functional status for more than 1 year. ⁽¹⁾

Definitions

NYHA Class Definitions ⁽¹⁾

- Class I: No limitation of functional activity. Ordinary physical activity does not cause symptoms of HF
- Class II: Slight limitation of activity. Comfortable at rest but ordinary physical activity results in symptoms of HF
- Class III: Marked limitation of activity. Comfortable at rest but less than ordinary activity causes symptoms of HF
- Class IV: Unable to continue any physical activity without symptoms of HF, or symptoms of HF at rest

Heart Block Definitions ⁽¹¹⁾

- First Degree: All atrial beats are conducted to the ventricles, but with a delay of > 200 ms
- Second Degree: Intermittent failure of conduction of single beats from atrium to ventricles.
 - Type I: Conducted beats have variable conduction times from atrium to ventricles.
 - Type II: Conducted beats have uniform conduction times from atrium to ventricles.
 - Advanced: Two or more consecutive non-conducted beats (premature atrial beats might not normally be conducted).
- Third Degree: No atrial beats are conducted from atrium to ventricle.

Guideline-Directed (or Optimal) Medical Therapy in Heart Failure ⁽⁷⁾

- Angiotensin converting enzyme inhibitor (ACE-I), angiotensin receptor blocker (ARB), or combined angiotensin receptor inhibitor and neprilysin inhibitor (ARNI)

- Beta blocker

Other options/considerations for GDMT ⁽⁷⁾

- Addition of loop diuretic for all NYHA class II – IV patients
- Addition of hydralazine and nitrate for persistently symptomatic African Americans, NYHA class III-IV
- Addition of an aldosterone antagonist, provided eGFR is ≥ 30 ml/min/1.73 m² and K⁺ < 5.0, NYHA class II-IV
- Not required for consideration of CRT: Ivabradine for NYHA class II – III, when a beta blocker has failed to reduce a sinus rate to < 70 bpm.

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁵⁾

- Appropriate Care- Median Score 7-9
- May be Appropriate Care- Median Score 4-6
- Rarely Appropriate Care- Median Score 1-3

Acronyms/Abbreviations

ACE-I: Angiotensin converting enzyme inhibitor

ARB: Angiotensin receptor blocker

ARNI: Combined angiotensin receptor inhibitor and neprilysin inhibitor

ATTR-CM: Transthyretin Amyloid Cardiomyopathy

AV: Atrioventricular

CAD: Coronary artery disease, same as ischemic heart disease

CHD: Congenital heart disease

CRT: Cardiac resynchronization therapy (also known as biventricular pacing)

EF: Ejection Fraction

eGFR: Estimated glomerular filtration rate

GDMT: Guideline-Directed Medical Therapy

HCM: Hypertrophic Cardiomyopathy

HF: Heart failure

HF_rEF: Heart failure with reduced ejection fraction

ICD: Implantable cardioverter-defibrillator

LBBB: Left bundle branch block
LV: Left ventricular/left ventricle
LVEF: Left ventricular ejection fraction
MI: Myocardial infarction
ms: Milliseconds
NYHA: New York Heart Association
RBBB: Right bundle branch block
RV: Right ventricle

SUMMARY OF EVIDENCE

2022 AHA/ACC/HFSA Guideline for the Management of Heart Failure ⁽⁷⁾

Study Design: This document is a clinical practice guideline for the management of heart failure, developed by the American College of Cardiology/American Heart Association/Heart Failure Society of America Joint Committee on Clinical Practice Guidelines. It is based on a comprehensive literature search conducted from May 2020 to December 2020, including studies, reviews, and other evidence from human subjects published in English.

Target Population: The guideline is intended for clinicians to prevent, diagnose, and manage patients with heart failure. It provides patient-centric recommendations for the treatment of heart failure, aiming to improve quality of care and align with patients' interests.

Key Factors: The guideline includes recommendations for the prevention, diagnosis, and management of heart failure, based on contemporary evidence. It covers various aspects such as stages of heart failure, classification by left ventricular ejection fraction, diagnostic algorithms, epidemiology, causes, initial and serial evaluation, use of biomarkers, genetic evaluation, cardiac imaging, invasive evaluation, remote monitoring, exercise and functional capacity testing, risk scoring, and management strategies for different stages of heart failure.

Arrhythmias in congenital heart disease ⁽¹⁰⁾

Study Design: This document is a position paper on arrhythmias in congenital heart disease, developed by the European Heart Rhythm Association, Association for European Pediatric and Congenital Cardiology, and the European Society of Cardiology Working Group on Grown-up Congenital Heart Disease, endorsed by HRS, PACES, APHRS, and SOLAECE. It is based on a detailed literature review and expert consensus.

Target Population: The position paper addresses arrhythmias in patients with congenital heart disease, focusing on young adults with congenital heart defects who suffer from arrhythmias due to the underlying defect or as a sequela of interventional or surgical treatment.

Key Factors: The paper discusses the management of arrhythmias in congenital heart disease, including pharmacological treatment, catheter ablation, and device therapy. It highlights the importance of understanding the individual pathological anatomy and physiology, as well as the natural history and long-term prognosis of patients. The document covers various types of

arrhythmias, their substrates, work-up, acute assessment, collaboration between specialists, general assessment, imaging requirements, specific arrhythmia types, and management strategies.

ACC/AHA/ASE/HFSA/HRS/SCAI/SCCT/SCMR 2025 Appropriate Use Criteria for Implantable Cardioverter-Defibrillators, Cardiac Resynchronization Therapy, and Pacing ⁽¹⁾

Study Design: This document is an appropriate use criteria (AUC) for implantable cardioverter-defibrillators (ICD), cardiac resynchronization therapy (CRT), and pacing, developed by the American College of Cardiology Solution Set Oversight Committee, American Heart Association, American Society of Echocardiography, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance. It is based on a comprehensive review of common clinical scenarios and expert consensus.

Target Population: The AUC document addresses patients who are candidates for ICD, CRT, and pacing therapies, including those with heart failure, genetic conditions, structural heart disease, and other related conditions.

Key Factors: The document provides a detailed review of 335 clinical scenarios related to ICD, CRT, and pacing, including secondary prevention, primary prevention, comorbidities, generator replacement, dual-chamber ICD, totally subcutaneous ICD, CRT, LVAD, heart transplantation, cardiac contractility modulation, leadless pacing, and conduction system pacing. It categorizes the scenarios as "Appropriate," "May Be Appropriate," or "Rarely Appropriate" based on the potential benefits and risks of device implantation.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,7,10)

- **Effectiveness:** All three documents recognize the effectiveness of CRT in managing heart failure and arrhythmias. They emphasize the importance of CRT in improving patient outcomes, particularly in those with reduced ejection fraction and heart failure symptoms.
- **Patient Selection:** The importance of selecting appropriate patients for CRT is highlighted across all documents. They stress the need for careful evaluation of patient characteristics, including ejection fraction, heart failure symptoms, and arrhythmia history.
- **Guideline Recommendations:** The documents provide guideline-based recommendations for CRT, ensuring that clinicians have access to evidence-based practices for managing heart failure and arrhythmias.

Conclusion ^(1,7,10)

In summary, these articles collectively provide a robust framework for managing various cardiovascular conditions, each contributing unique insights and recommendations tailored to specific patient populations and clinical scenarios.

POLICY HISTORY

Date	Summary
July 2025	Reviewed to reconcile dates, no substantive changes made
June 2025	Added a Summary of Evidence and Analysis of Evidence
April 2025	- This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7263-01 for Cardiac Resynchronization Therapy and ECG 320 for Cardiac Resynchronization Therapy into Evolent Clinical Guideline 7263 for Cardiac Resynchronization Therapy - This guideline also merges Procedure Codes from these two Evolent guidelines - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Updated CRT indication for cardiomyopathy per recent societal appropriate use criteria - Corrected and added other CRT indications for congenital heart disease - Adjusted applicable lines of business – Medicare Advantage checked

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-



covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 7301 for Implantable Cardioverter Defibrillator

Guideline Number: Evolent_CG_7301	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for determining medical necessity for an implantable cardiac defibrillator (ICD). Implantable cardioverter defibrillators (ICDs) are indicated for the treatment of life-threatening ventricular tachycardia and ventricular fibrillation. All indications are predicated on a meaningful life expectancy of greater than one year if the ICD is implanted.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ⁽¹⁻⁵⁾

INDICATIONS FOR ICD INSERTION

Ischemic Heart Disease (CAD) ^(6,7)

Primary Prevention of SCD/Prophylactic ICD Implantation

- Post- Acute MI (≤ 40 days)

- LVEF $\leq$ 30%
 - Asymptomatic NSVT (4 or more days post MI), and EPS with sustained inducible VT after revascularization (within 40 days of MI) **(AUC SCORE 7)** or without revascularization **(AUC SCORE 8)**
- LVEF 31-40%
 - Asymptomatic NSVT (4 or more days post MI) and EPS with sustained inducible VT after revascularization (within 40 days of MI) **(AUC SCORE 7)**
- Pre-existing Chronic Cardiomyopathy
 - LVEF $\leq$ 30% due to old infarction, NYHA class I **(AUC SCORE 7)**
 - LVEF $\leq$ 35% due to old infarction or nonischemic causes, NYHA class II or III **(AUC SCORE 8)**
- Need for Guideline-Directed Pacemaker Therapy and LVEF $\leq$ 35% **(AUC SCORE 7)**
- Post MI (> 40 days)
 - With Ischemic Cardiomyopathy
 - No recent PCI/CABG
 - NYHA Class I
 - ◆ LVEF $\leq$ 30% **(AUC SCORE 8)**
 - ◆ LVEF 31% - 35% **(AUC SCORE 7)**
 - ◆ LVEF 36% - 40%, asymptomatic NSVT and EPS with inducible sustained VT/VF **(AUC SCORE 7)**
 - NYHA Class II-III
 - ◆ LVEF $\leq$ 35 % **(AUC SCORE 9)**
 - ◆ LVEF 36% - 40%, asymptomatic NSVT and EPS with inducible sustained VT/VF **(AUC SCORE 8)**
 - Recent PCI or CABG (within past 3 months)
 - NYHA Class I, II, or III
 - ◆ LVEF $\leq$ 35% on GDMT (for at least 3 months) and pre-existing cardiomyopathy **(AUC SCORE 7)**
 - ◆ LVEF $\leq$ 35% and need for permanent pacemaker post revascularization **(AUC SCORE 8)**
- Without recent MI
 - With Ischemic Cardiomyopathy, revascularization not indicated
 - GDMT < 3 months
 - LVEF $\leq$ 35%, NSVT and EPS with inducible sustained VT **(AUC SCORE 8)**
 - GDMT $\geq$ 3 months

- LVEF $\leq$ 35% (**AUC SCORE 9**)

Secondary Prevention of SCD

- Hemodynamically unstable or sustained VT, VF or polymorphic VT
 - during or within 48 hours of acute MI
 - not amenable to revascularization (**AUC SCORE 7**)
 - post-elective revascularization (**AUC SCORE 7**)
 - no recent MI and no recent revascularization
 - no identifiable transient and completely reversible causes, and no need for revascularization (**AUC SCORE 8-9**)
 - significant CAD but no revascularization performed (**AUC SCORE 8-9**)
 - significant CAD and incomplete revascularization after cardiac arrest (**AUC SCORE 7-9**)
 - significant CAD and complete revascularization performed after cardiac arrest, if LVEF is $\leq$ 35% (**AUC SCORE 7**)
- Unexplained syncope, with inducible VF or sustained VT at electrophysiological study, LVEF 36-49% and prior MI (not acute) (**AUC SCORE 8**)
- Unexplained Syncope, with LVEF $\leq$ 35%, and prior MI (not acute) (**AUC SCORE 8-9**)
- Sustained **hemodynamically stable** Monomorphic VT associated with structural heart disease
 - LVEF $\geq$ 36%
 - CAD and prior MI or Nonischemic Dilated Cardiomyopathy (**AUC SCORE 7**)
 - LVEF $\leq$ 35%
 - Bundle branch re-entry successfully ablated and Nonischemic Cardiomyopathy (**AUC SCORE 7**)
 - Nonischemic dilated cardiomyopathy with all inducible VTs successfully ablated (**AUC SCORE 8**)
 - CAD and prior MI or nonischemic dilated cardiomyopathy (**AUC SCORE 9**)

Nonischemic Cardiomyopathy (NICM) ⁽⁶⁾

Primary Prevention of SCD/Prophylactic ICD Implantation

- Lamin A/C gene mutation, with $\geq$ 2 risk factors from the following: NSVT, LVEF $<$ 45%, male sex, missense mutation
- Without recent MI
 - GDMT $\geq$ 3 months and any of the following:
 - LVEF $\leq$ 35%; age $<$ 85 years; any QRS duration (**AUC SCORE 7-8**)

- LVEF $\leq$ 35%; age > 85 years; any QRS duration, NYHA II-III (**AUC SCORE 6**)
- LVEF >35% with LGE on MRI and NYHA II-III (**AUC SCORE 6**)
- Chagas disease, even if on GDMT < 3 months, LVEF $\leq$ 35% (**AUC SCORE 8**)

Secondary Prevention of SCD

- Unexplained syncope
 - with LVEF <50% and
 - Left ventricular noncompaction (**AUC SCORE 7**)
 - Hypertrophic cardiomyopathy (**AUC SCORE 8**)
 - With LVEF $\leq$ 35% and
 - Non-ischemic dilated cardiomyopathy (**AUC SCORE 8**)
 - Left ventricular noncompaction (**AUC SCORE 8**)
 - With arrhythmogenic right ventricular cardiomyopathy (**AUC SCORE 7-8**)
- Hemodynamically unstable or sustained VT, polymorphic VT or VF, not due to a reversible cause (**AUC SCORE 8-9**)

Advanced Heart Failure & Transplantation ^(6,7)

- In non-hospitalized patients with **NYHA** class IV who are candidates for cardiac transplantation or left ventricular assist device (LVAD)
- In a patient with an LVAD, with sustained ventricular arrhythmias
- In **NYHA** ambulatory class IV, with appropriate indications for CRT

Myocardial Diseases

Hypertrophic Cardiomyopathy (HCM) ^(6–9)

- Previously documented cardiac arrest
- Sustained VT (**AUC SCORE 9**)
- Adult patients with HCM with at least 1 risk factor for SCD as follows (**AUC SCORE 8**):
 - Sudden death attributable to HCM in at least 1 first-degree relative who is $\leq$ 50 years of age
 - LVH $\geq$ 30 mm
 - At least 1 recent (within 5 years) episode of syncope suspected by history to be arrhythmic (unlikely neurocardiogenic (vasovagal), especially occurring within 6 months of evaluation)
 - LV apical aneurysm
 - LV systolic dysfunction (EF < 50%)

- Pediatric patients with HCM with at least 1 risk factor for SCD as follows:
 - Unexplained syncope
 - LVH ≥ 30 mm
 - Nonsustained VT
 - Family history of HCM-related SCD
- Structural cardiac disease with genetic arrhythmogenic cardiomyopathy (i.e. Lamin A/C mutation) and LVEF $< 45\%$ (**AUC SCORE 7**)

Cardiac Sarcoidosis

With one of the following ^(6,7,10):

- Cardiac arrest or documented sustained VT
- VF/Hemodynamically unstable VT that is associated with other structural heart disease (**AUC SCORE 9**)
- LVEF $> 35\%$ with inducible sustained VA at electrophysiological testing
- LVEF $\leq 35\%$
- Syncope and/or scar on CMR or PET
- Requires a permanent pacemaker

Giant-Cell Myocarditis ⁽⁶⁾

- VF/Hemodynamically unstable VT that is associated with other structural heart disease (**AUC SCORE 8**)

Neuromuscular Disorders

Including but not limited to Duchenne, Becker, Limb-girdle type 1B, Limb-girdle type 2C-2F, Limb-girdle type 2I, Myotonic type 1, Myotonic type 2, Emery-Dreifuss, or Facioscapulohumeral Muscular Dystrophy with one of the following ^(6,7):

- Primary and secondary prevention, with same indications as for NICM
- Emery-Dreifuss or limb-girdle type I-B muscular dystrophy with progressive cardiac involvement

Arrhythmogenic Right Ventricular Cardiomyopathy

With at least one of the following risk factors for SCD ⁽⁶⁻⁸⁾:

- Resuscitated sudden cardiac arrest
- Sustained VT (**AUC SCORE 9**)
- Right or left ventricular systolic dysfunction with an EF $\leq 35\%$
- Syncope with documented or presumed ventricular arrhythmia

Channelopathies

Congenital Long QT Syndrome

With one of the following **(AUC SCORE 9)** ^(6,7):

- Sudden cardiac arrest
- Sustained VT **(AUC SCORE 9)** or recurrent syncope when beta blocker is ineffective or not tolerated **(AUC SCORE 7)**
- QTc > 500 ms on a beta blocker
- Strong family history of SCD
- High risk genotype

Brugada Syndrome and Spontaneous Type 1 Brugada Echocardiographic Pattern

With one of the following ^(6,7,9):

- Cardiac arrest
- Documented sustained VT/VF **(AUC SCORE 9)**
- Unexplained syncope **(AUC SCORE 7-9)**

Catecholaminergic Polymorphic VT

With one of the following ^(6,7):

- Sudden cardiac arrest
- Syncope or sustained VT/VF **(AUC SCORE 9)**
- Inducible VT or VF
- Unexplained syncope with beta-blockers **(AUC SCORE 7)**
- Not tolerating medical therapy or breakthrough nonsustained ventricular arrhythmias on medical therapy **(AUC SCORE 8)**

Early Repolarization ("J-wave Syndrome") or Short QT Syndrome

With one of the following **(AUC SCORE 9)** ^(6,7):

- Cardiac arrest
- Sustained VA

Idiopathic Polymorphic VT/VF ^(6,7)

- Cardiac arrest due to polymorphic VT or VF
- Normal ventricular function and no family history or first-degree relative with sudden cardiac death **(AUC SCORE 8-9)**

Adult & Pediatric Congenital Heart Disease (CHD) (7,9,11)

- Cardiac arrest due to VF or VT, or unstable VT, after exclusion of a reversible etiology
- Symptomatic sustained VT, after hemodynamic and electrophysiologic evaluation
- Systemic LVEF $\leq 35\%$, biventricular physiology, and **NYHA** class II or III on **GDMT**
- Single or systemic RVEF $< 35\%$, in the presence of an additional risk factor such as:
 - NSVT
 - Unexplained syncope
 - NYHA class II or III, despite GDMT
 - QRS duration ≥ 140 ms
 - Severe systemic AV valve regurgitation
- Syncope of unknown origin in the presence of either at least moderate ventricular dysfunction or marked hypertrophy or inducible sustained VT or VF
- Syncope and moderate or severe complexity CHD, with high clinical suspicion of VA
- Non-hospitalized patients with CHD awaiting heart transplant (**AUC SCORE 7**)
- Left ventricular non-compaction that meets same indications as NICM, including a familial history of SCD (**AUC SCORE 8**)

ICD Indications With Special Situations (6,7,12)

- ICD implantation is appropriate in the setting of elevated troponin levels when ICD criteria have been met, and elevated troponin is deemed not due to a myocardial infarction

NOTE: In the following circumstances, CRT is likely to be the appropriate modality when it is anticipated that significant ($> 40\%$) ventricular pacing will be required:

- ICD criteria met, except for myocardial infarction within 40 days or revascularization within 3 months, but a non-elective permanent pacemaker (new or replacement) is required, and recovery of left ventricular function to LVEF $> 35\%$ is uncertain or not expected *
- ICD criteria met, except NICM or ischemic cardiomyopathy has not had 3 months' time for LVEF to improve on medical therapy, a non-elective permanent pacemaker is required, and recovery of LVEF is uncertain or not expected*
- Patient met primary prevention criteria for an ICD prior to surgical coronary revascularization, and it is unlikely that LVEF will recover to $> 35\%$ despite a 90-day wait (permits placement of an epicardial LV lead)

*** These indications avoid a second implantation procedure within less than 3 months**

SUBCUTANEOUS ICD

Subcutaneous ICD may be used in any patient meeting the criteria for a transvenous device, with the following exceptions ⁽⁶⁾:

- Bradycardia requiring pacing
- Anticipated need for Cardiac Resynchronization Therapy (CRT)
- Anticipated need for anti-tachycardia pacing (ATP)
- Anticipated need for pacing following termination of VT/VF

Additionally, subcutaneous ICD is often the modality of choice in patients with no or limited transvenous access, and may be preferable for patients with an elevated risk of infection.

CODING AND STANDARDS

Codes

33216, 33217, 33230, 33231, 33240, 33249, 33270, 33271, 33272, 33273, 93640, 93641, 93644

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Patient eligibility for an ICD presumes all the following:

- Anticipated reasonable quality of life for $\geq$ 1-year post implantation
- Patient's ability to live with a shock-delivering device that requires management
- Absence of a completely reversible cause that led to VA for which an ICD is being considered
- Completion of $\geq$ 3 months of guideline-directed medical therapy (GDMT) for heart failure (HF), unless an intervening indication for pacemaker implantation arises

- ICD indications are present in most scenarios in which cardiac resynchronization therapy (CRT) is appropriate

Guidelines for the pediatric population are extrapolated from the adult population due to a lack of relevant trials.

NYHA Class Definitions ⁽⁶⁾

- Class I: No limitation of functional activity. Ordinary physical activity does not cause symptoms of HF
- Class II: Slight limitation of activity. Comfortable at rest but ordinary physical activity results in symptoms of HF
- Class III: Marked limitation of activity. Comfortable at rest but less than ordinary activity causes symptoms of HF
- Class IV: Unable to continue any physical activity without symptoms of HF, or symptoms of HF at rest

Guideline Directed (or Optimal) Medical Therapy in Heart Failure ⁽¹³⁾

- Angiotensin converting enzyme inhibitor (ACE-I), angiotensin receptor blocker (ARB), or combined angiotensin receptor inhibitor and neprilysin inhibitor (ARNI)
- Beta blocker

Other Options/Considerations for GDMT

- Addition of loop diuretic for all NYHA class II – IV patients
- Addition of hydralazine and nitrate for persistently symptomatic African Americans, NYHA class III-IV
- Addition of an aldosterone antagonist, provided eGFR is ≥ 30 ml/min/1.73m² and K⁺ < 5.0, NYHA class II-IV
- Normal serum sodium and potassium
- Not required for consideration of ICD: Ivabradine for NYHA class II – III, when a beta blocker has failed to reduce a sinus rate to < 70 bpm. Ivabradine listed as a class IIa recommendation, while others are class I recommendations. CRT trials antedated routine use of Ivabradine.

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽²⁾

- Appropriate Care - Median Score 7-9

- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Abbreviations

ACE-I: Angiotensin converting enzyme inhibitor

ARNI: Combined angiotensin receptor inhibitor and neprilysin inhibitor

ARVD/C: Arrhythmogenic right ventricular dysplasia/cardiomyopathy

AV: Atrioventricular

CAD: Coronary artery disease, same as ischemic heart disease

CHD: Congenital heart disease

CHF: Congestive heart failure

CRT: Cardiac resynchronization therapy

CRT-D: Cardiac resynchronization therapy ICD system

DCM: Dilated cardiomyopathy

ECG: Electrocardiogram

EF: Ejection fraction

EPS: Electrophysiologic Study

GDMT: Guideline-Directed Medical Therapy

HCM: Hypertrophic cardiomyopathy

HF: Heart failure

HV: His-ventricle

ICD: Implantable cardioverter-defibrillator

LBBB: Left bundle-branch block

LV: Left ventricular/left ventricle

LVAD: Left ventricular assist device, mechanical heart

LVEF: Left ventricular ejection fraction

LVH: Left ventricular hypertrophy

MI: Myocardial infarction

ms: Milliseconds

NICM: Nonischemic cardiomyopathy

NSVT: Nonsustained ventricular tachycardia

NYHA: New York Heart Association

PET: Positron emission tomography

PVC: Premature Ventricular Contraction

RV: Right ventricular/right ventricle

RVEF: Right ventricular ejection fraction

SCD: Sudden Cardiac Death

STEMI: ST-elevation myocardial infarction

SND: Sinus node dysfunction

VA: Ventricular arrhythmia

VF: Ventricular fibrillation

VT: Ventricular tachycardia

SUMMARY OF EVIDENCE

2017 AHA/ACC/HRS Guideline for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death ⁽⁷⁾

Study Design: The guideline is based on a systematic review of evidence from various sources, including randomized controlled trials (RCTs), registries, nonrandomized comparative and descriptive studies, case series, cohort studies, systematic reviews, and expert opinion. The writing committee used evidence-based methodologies to formulate recommendations, focusing on the quality of scientific evidence and the magnitude and certainty of benefit in proportion to risk.

Target Population: The guideline is intended for adults who have ventricular arrhythmias (VA) or are at risk for sudden cardiac death (SCD), including those with diseases and syndromes associated with a risk of SCD from VA. It covers a wide range of conditions, including ischemic heart disease, nonischemic cardiomyopathy, arrhythmogenic right ventricular cardiomyopathy, hypertrophic cardiomyopathy, myocarditis, cardiac sarcoidosis, neuromuscular disorders, and cardiac channelopathies.

Key Factors:

- **Indications for ICD Implantation:** Secondary prevention: For patients who survive sudden cardiac arrest (SCA) due to VA or experience hemodynamically unstable VT. Primary prevention: For patients with reduced left ventricular ejection fraction (LVEF) due to ischemic or nonischemic cardiomyopathy.
- **Pharmacological Therapy:** Beta blockers are recommended for patients with VA and SCD risk. Amiodarone and sotalol are useful for suppressing recurrent VA.
- **Genetic Testing and Counseling:** Recommended for patients with inherited arrhythmia syndromes and their first-degree relatives.
- **Special Considerations:** Management of VA in specific populations such as athletes, pregnant women, older patients with comorbidities, and patients with chronic kidney disease.

ACC/AHA/ASE/HFSA/HRS/SCAI/SCCT/SCMR 2025 Appropriate Use Criteria for Implantable Cardioverter-Defibrillators, Cardiac Resynchronization Therapy, and Pacing⁽⁶⁾

Study Design: The document is a report by the American College of Cardiology Solution Set Oversight Committee, along with several other cardiovascular societies. It reviews common clinical scenarios where ICDs, CRT, and pacing therapies are frequently considered. The indications were developed by a multidisciplinary writing group and scored by an independent rating panel using a scale to designate care as "Appropriate," "May Be Appropriate," and "Rarely Appropriate".

Target Population: The guidelines cover a wide range of patients, including those with coronary artery disease (CAD), nonischemic cardiomyopathy (CM), genetic conditions, and other structural heart diseases. It addresses both primary and secondary prevention of sudden cardiac death (SCD) and includes patients with heart failure (HF), atrial fibrillation (AF), and those undergoing device implantation.

Key Factors

- **Clinical Scenarios:** The document includes 335 clinical scenarios addressing ICD indications related to secondary prevention, primary prevention, comorbidities, generator replacement, dual-chamber ICDs, and totally subcutaneous ICDs.
- **Risk Assessment:** It emphasizes the importance of comprehensive SCD risk assessment, including factors such as personal history of cardiac arrest, family history of SCD, maximal LV wall thickness, EF, LV apical aneurysm, and NSVT episodes.
- **Device Selection:** Recommendations for ICD device selection consider patient preferences, age, lifestyle, and potential need for pacing.
- **Outcomes:** The guidelines aim to enhance clinician decision-making, healthcare delivery, and payment policy, recognizing clinical scenarios rated as "May Be Appropriate" to identify areas for future research.

2024 AHA/ACC/AMSSM/HRS/PACES/SCMR Guideline for the Management of Hypertrophic Cardiomyopathy⁽⁹⁾

Study Design: This document is a guideline developed by the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines, in collaboration with several other medical societies. It includes recommendations based on a comprehensive literature search and evidence review.

Target Population: The guidelines focus on patients with hypertrophic cardiomyopathy, including adults, children, and adolescents. It addresses the diagnosis, risk assessment, and management of HCM, including the use of ICDs for SCD prevention.

Key Factors

- **Risk Assessment:** The document highlights the importance of SCD risk assessment in HCM patients, including factors such as family history of SCD, maximal LV wall thickness, unexplained syncope, LV apical aneurysm, extensive LGE, and NSVT episodes.

- **ICD Placement:** Recommendations for ICD placement in high-risk HCM patients consider individual clinical judgment, shared decision-making, and the presence of major risk factors.
- **Device Selection:** The guidelines discuss the selection of ICD devices, including single-chamber, dual-chamber, and subcutaneous ICDs, based on patient preferences and clinical needs.
- **Management:** The document provides recommendations for the pharmacological and invasive treatment of symptomatic HCM patients, including the use of beta blockers, calcium channel blockers, myosin inhibitors, and septal reduction therapies.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(6,7,9)

- All three articles emphasize the importance of comprehensive risk assessment for SCD and the use of ICDs for both primary and secondary prevention.
- They highlight the need for individualized patient care, considering factors such as patient preferences, age, lifestyle, and clinical needs.
- The guidelines recognize the importance of shared decision-making and patient-centered care in managing patients at risk for SCD.

POLICY HISTORY

Date	Summary
July 2025	● Added CPT codes for subcutaneous ICD
June 2025	● Added Summary of Evidence and Analysis of Evidence ● Added third bullet to General Information ● Checked Medicare Advantage Line of Business
April 2025	● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7301-01 for Implantable Cardioverter Defibrillator and ECG 321 for Implantable Cardioverter Defibrillator with ECG 7301 for Implantable Cardioverter Defibrillator ○ This guideline also merges procedural codes ● This guideline replaces Evolent Clinical Guideline 7329 for Subcutaneous ICD Device Implantation ● Added background section explaining AUC scores ● Updated and added new AUC scores in accordance with new ACC

Date	Summary
	guidance • Added Giant-Cell Myocarditis • Added subcutaneous ICD

LEGAL AND COMPLIANCE

Guideline Approval

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 7315 for Pacemaker Insertion

Guideline Number: Evolut_CG_7315	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

This guideline is not intended to specify the type of bradycardia pacing device. CRT (cardiac resynchronization therapy or biventricular pacing) and ICD (implantable cardioverter defibrillator) implantation are covered in separate guidelines. Pacemaker implantation generally serves to address bradycardia, with the intention of ameliorating related symptoms, preventing complications of syncope, and/or reducing mortality risk.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ^(1–5)

INDICATIONS FOR PACEMAKERS IN ADULTS

Excludes conditions that are expected to resolve.

Sinus Node Dysfunction (SND) (6–9)

- Documented symptomatic sinus bradycardia, including frequent sinus pauses
- Symptomatic chronotropic incompetence (broadly defined as an inability to increase heart rate commensurate with activity or demand), documented by stress test or cardiac monitoring data
- Symptomatic sinus bradycardia resulting from required guideline-directed medical therapy (GDMT) for which there is no alternative treatment
- Heart rate < 40 beats per minute (bpm) while awake, even without definite association with significant symptoms consistent with bradycardia
- Tachycardia-bradycardia syndrome and symptoms attributable to bradycardia
- Syncope of unexplained origin with clinically significant SND, either documented or provoked in electrophysiologic study (EPS)
- With LBBB and LVEF < 50% (**AUC 6**)

Acquired Atrioventricular (AV) Block (6,7,9)

First-Degree AV Block

- Marked first-degree Mobitz Type 1 AV block with symptoms clearly attributable to the AV block
- First-degree block with a long PR interval (>200 ms) and LVEF ≤ 35% (**AUC 7**) or 36-50% (**AUC 6**)
- First-degree AV block with “pacemaker syndrome” symptoms (chronic fatigue, dyspnea on exertion, symptomatic hypotension) or hemodynamic compromise

Second Degree AV Block (Mobitz Types I and II)

- Second degree Mobitz Type 1 AV Block with a narrow QRS and LVEF ≤ 35% (**AUC 7**) or 36-50% (**AUC 6**)
- Marked second-degree Mobitz Type 1 AV block with symptoms clearly attributable to the AV block
- Second-degree AV block with “pacemaker syndrome” symptoms (chronic fatigue, dyspnea on exertion, symptomatic hypotension) or hemodynamic compromise
- Second-degree Mobitz Type II AV block regardless of symptoms¹
- Advanced second-degree AV block
- Second-degree AV block with EPS-documented intra- or infra-His conduction delay of 70 ms or greater
- Symptomatic bradycardia associated with second-degree AV block, either Mobitz I or II

Third-Degree/Complete AV Block

- Third-degree (complete) AV block, intermittent with LVEF $\leq$ 35% (**AUC 7**) or 36-50% (**AUC 6**) or persistent, regardless of symptoms and LVEF $<$ 50% (**AUC 7**) or $>$ 50% (**AUC 6**)
 - If the only symptom is a narrow junctional escape rhythm and LVEF is $>$ 50%, pacemaker is not indicated (**AUC 5**)
- High-grade AV block, regardless of symptoms

Atrial Fibrillation (AF)/Other^(6,7,9)

- AF, with pauses $\geq$ 5 seconds while awake, or symptomatic bradycardia
- In sinus rhythm (with AV block) while awake, pauses $\geq$ 3 seconds or heart rate $<$ 40 bpm or an escape rhythm below the AV node
- Following catheter ablation of the AV junction
- Symptomatic AV block that results from required medical therapy for which there is no alternative treatment
- Exercise-induced second- or third-degree AV block without myocardial ischemia
- With slow ventricular response and LVEF $<$ 50% (**AUC 7**)

Neuromuscular Disorders^(6,7)

- Marked first-degree or higher AV block, or an H-V (His-ventricular) interval $\geq$ 70 ms, associated with neuromuscular diseases, such as myotonic muscular dystrophy, Erb's dystrophy, Kearns-Sayre syndrome, and peroneal muscular atrophy, regardless of symptoms

Chronic Fascicular Block*^(6,7,10)

*includes right bundle branch (RBBB), left bundle branch (LBBB), left anterior hemi (LAHB), and left posterior hemi (LPHB) block

- Alternating bundle-branch block
- Syncope and bundle branch block with an H-V interval $\geq$ 70 ms, or evidence of infranodal block at EPS
- Incidental findings at EPS study of an H-V interval $\geq$ 100 milliseconds, or non-physiological, pacing-induced infra-His block in asymptomatic patients Hypersensitive Carotid Sinus Syndrome And Neurocardiogenic Syncope
- Recurrent syncope due to spontaneously occurring carotid sinus stimulation AND carotid sinus pressure induced ventricular asystole $\geq$ 3 seconds⁽⁶⁾, or AV block, or $\geq$ 50 mmHg drop in systolic blood pressure (BP)
- Syncope without clear, provocative events and with a hypersensitive cardioinhibitory response (asystole) $\geq$ 3 seconds

- Recurrent syncope and asystole ≥ 3 seconds with syncope or ≥ 6 seconds without symptoms or with presyncope, documented by ECG recording data

Pacing to Terminate or Prevent Tachycardia ⁽⁶⁾

- Symptomatic recurrent supraventricular tachycardia documented to be terminated by pacing in the setting of failed catheter ablation and/or drug treatment
- Prevention of pause-dependent VT

Hypertrophic Cardiomyopathy (HCM) ⁽⁶⁾

- Permanent pacing may be considered in medically refractory symptomatic patients with HCM and significant resting or provoked left ventricle (LV) outflow tract obstruction

Leadless Pacemakers⁽⁹⁾

Leadless pacemakers can only provide ventricular pacing but have fewer complications than transvenous pacemakers. Therefore, permanent pacing via leadless pacemaker is indicated for patients with nonreversible symptomatic bradycardia who are not eligible for an implantable cardioverter defibrillator (ICD), and have one or more of the following:

- No upper extremity access and left ventricular ejection fraction (LVEF) $> 50\%$ **(AUC 7)**
- Long-standing persistent or permanent AF and normal LVEF, when the longevity of the device is anticipated to be greater than patient survival, and the need for pacing is anticipated as $< 40\%$ **(AUC 7)**
- History of multiple cardiovascular implantable electronic device (CIED) infections, LVEF $> 50\%$ and need for pacing anticipated as $< 40\%$ **(AUC 7)**
- AV junction ablation and long-standing persistent/permanent AF, LVEF $> 50\%$ **(AUC 7)**
- Pre-existing subcutaneous ICD and need for pacing anticipated as $< 40\%$
 - LVEF $> 50\%$ and persistent/permanent AF **(AUC 7)** OR
 - Paroxysmal AF **(AUC 7)**

INDICATIONS FOR CHILDREN, ADOLESCENTS (<19 YEARS), AND ADULT PATIENTS WITH CONGENITAL HEART DISEASE (CHD)

Sinus Node Dysfunction ^(7,11)

- SND with symptomatic age- and activity-inappropriate bradycardia
- Sinus bradycardia with complex CHD AND a resting heart rate < 40 bpm **OR** pauses in ventricular rate > 3 seconds

- CHD and impaired hemodynamics due to sinus bradycardia or loss of AV synchrony
- Asymptomatic sinus bradycardia following repair of CHD with an awake resting heart rate < --40 bpm or pauses in ventricular rate > 3 seconds
- CHD and SND or junctional bradycardia, for the prevention of recurrent episodes of intra-atrial reentrant tachycardia

AV Block (6–8)

- Second- or third-degree AV block with symptomatic bradycardia, ventricular dysfunction, or low cardiac output
- Congenital third-degree AV block with a wide QRS escape rhythm, complex ventricular ectopy, or ventricular dysfunction
- Postoperative advanced second- or third-degree AV block that is not expected to resolve or that persists at least 7 days after cardiac surgery
- Congenital third-degree AV block in the infant with a ventricular rate < 55 bpm or with congenital heart disease and a ventricular rate < 70 bpm
- Congenital third-degree AV block after 1 year of age with an average heart rate < 50 bpm, abrupt pauses in ventricular rate that are 2 or 3 times the basic cycle length, or associated with symptoms due to chronotropic incompetence
- Adults with congenital complete AV block with symptomatic bradycardia, wide QRS escape rhythm, mean daytime heart rate < 50 bpm, complex ventricular ectopy, or ventricular dysfunction
- Adults with congenital complete AV block, regardless of symptoms
- Unexplained syncope after prior congenital heart surgery complicated by transient complete heart block, with residual fascicular block after excluding other causes of syncope
- Congenital third-degree AV block in asymptomatic children or adolescents with an acceptable rate, a narrow QRS, and normal ventricular function

CODING AND STANDARDS

Codes

33206, 33207, 33208, 33212, 33213

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial

☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽²⁾

- *Appropriate Care - Median Score 7-9*
- *May be Appropriate Care - Median Score 4-6*
- *Rarely Appropriate Care - Median Score 1-3*

Heart Block Definitions ⁽⁶⁾

- First-Degree: All sinus or atrial beats are conducted to the ventricles, but with a delay (PR interval of > 200 ms)
- Second-Degree: Intermittent failure of conduction of single beats from atrium to ventricles
 - (Mobitz) Type I: Conducted beats have variable conduction times from atrium to ventricles
 - (Mobitz) Type II: Conducted beats have uniform conduction times from atrium to ventricles
 - Advanced or high degree: Two or more consecutive non-conducted sinus or (non-premature) atrial beats with some conducted beats
- Third-Degree: No atrial beats are conducted from atrium to ventricle

Acronyms / Abbreviations

AV: Atrioventricular

BP: blood pressure

BPM: beats per minute

CHF: Congestive heart failure

CRT: Cardiac resynchronization therapy (same as biventricular pacing)

ECG: Electrocardiogram

EPS: Electrophysiologic Study
GDMT: Guideline-Directed Medical Therapy
HCM: Hypertrophic cardiomyopathy
H-V: His-ventricular
ICD: Implantable cardioverter-defibrillator
LAHB: Left Anterior Hemiblock
LBBB: Left bundle-branch block
LPHB: Left Posterior Hemiblock
LV: Left ventricular/left ventricle
LVEF: Left ventricular ejection fraction
MI: Myocardial infarction
ms: Milliseconds
RBBB: Right Bundle Branch Block
s: Seconds
STEMI: ST-elevation Myocardial Infarction
SND: Sinus node dysfunction
VT: Ventricular tachycardia

SUMMARY OF EVIDENCE

2012 ACCF/AHA/HRS focused update incorporated into the ACCF/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities⁽⁶⁾

Study Design: This document is a guideline developed by the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines, in collaboration with several other medical societies. It includes recommendations based on a comprehensive literature search and evidence review.

Target Population: The guidelines focus on patients with hypertrophic cardiomyopathy, including adults, children, and adolescents. It addresses the diagnosis, risk assessment, and management of HCM, including the use of ICDs for SCD prevention.

Key Factors

- **Risk Assessment:** The document highlights the importance of SCD risk assessment in HCM patients, including factors such as family history of SCD, maximal LV wall thickness, unexplained syncope, LV apical aneurysm, extensive LGE, and NSVT episodes.
- **ICD Placement:** Recommendations for ICD placement in high-risk HCM patients consider individual clinical judgment, shared decision-making, and the presence of major risk factors.

- **Device Selection:** The guidelines discuss the selection of ICD devices, including single-chamber, dual-chamber, and subcutaneous ICDs, based on patient preferences and clinical needs.
- **Management:** The document provides recommendations for the pharmacological and invasive treatment of symptomatic HCM patients, including the use of beta blockers, calcium channel blockers, myosin inhibitors, and septal reduction therapies.

2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients with Bradycardia and Cardiac Conduction Delay ⁽⁷⁾

Study Design: This document is a guideline developed by the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society, in collaboration with several other medical societies. It includes recommendations based on a comprehensive literature search and evidence review.

Target Population: The guidelines focus on patients with bradycardia and cardiac conduction delay, including adults with sinus node dysfunction (SND), atrioventricular (AV) block, and other conduction disorders. It addresses the diagnosis, risk assessment, and management of these conditions.

Key Factors

- **Risk Assessment:** The document emphasizes the importance of identifying reversible causes of bradycardia and conduction delay, such as medications, electrolyte imbalances, and underlying medical conditions.
- **Device Selection:** Recommendations for pacemaker implantation consider patient preferences, age, lifestyle, and clinical needs.
- **Management:** The guidelines provide recommendations for the acute and chronic management of bradycardia and conduction delay, including the use of temporary and permanent pacing.

ACC/AHA/ASE/HFSA/HRS/SCAI/SCCT/SCMR 2025 Appropriate Use Criteria for Implantable Cardioverter-Defibrillators, Cardiac Resynchronization Therapy, and Pacing ⁽⁹⁾

Study Design: The study involved the development of Appropriate Use Criteria (AUC) for ICDs, cardiac resynchronization therapy (CRT), and pacing. The process included drafting clinical scenarios based on patient presentations encountered in everyday practice. These scenarios were evaluated by an independent rating panel using a scoring scale from 1 to 9.

Target Population: The study focused on patients who may require ICDs, CRT, or pacing therapies. This includes patients with coronary artery disease (CAD), nonischemic cardiomyopathy (CM), genetic arrhythmia diseases, heart failure (HF), and those with left ventricular assist devices (LVADs).

Key Factors:

- **Clinical Scenarios:** The scenarios included information on symptom status, risk level as assessed by noninvasive testing, coronary disease burden, and in some cases, fractional flow reserve testing, presence or absence of diabetes, and SYNTAX score.
- **Scoring:** Each indication was scored as “Appropriate” (7 to 9), “May Be Appropriate” (4

to 6), or “Rarely Appropriate” (1 to 3).

- **Therapy Options:** The study evaluated the appropriateness of ICDs, CRT, and pacing therapies for various clinical scenarios.
- **Emphasis:** The study emphasized the importance of guideline-directed medical therapy and antianginal therapy in the management of patients.
- **Patient Preference:** The study highlighted the role of shared decision-making and patient preferences in the selection of therapy options.

ANALYSIS OF EVIDENCE

Shared Conclusions

All three articles emphasize the importance of evidence-based practice and provide detailed guidelines for pacemaker implantation based on clinical evidence. They all address specific conditions requiring pacing and offer recommendations for the evaluation and management of patients with bradycardia and conduction disorders. Additionally, they highlight the importance of correlating symptoms with bradycardia and conduction disorders to ensure appropriate management.

In summary, these articles collectively provide a comprehensive understanding of pacemaker implantation, highlighting the importance of evidence-based practice, detailed evaluation, and management of bradycardia and conduction disorders, while also addressing specific conditions and emphasizing patient-centered care.

POLICY HISTORY

Date	Summary
July 2025	● Reviewed to reconcile dates, no substantive changes made
June 2025	● Added third bullet to General Information ● Added Summary of Evidence and Analysis of Evidence ● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7315-01 for Pacemaker Implantation and ECG 322 for Pacemaker ○ This guideline also merges procedural codes ● Guideline name changed to Pacemaker Insertion
April 2025	● Guideline number changed to 7315 ● Updated citations

Date	Summary
	• Updated indications for leadless pacemakers • Updated indications for chronic fascicular block • Removed Contraindications • Reduced Background

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2055 for Temporomandibular Joint (TMJ) Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2055	<u>Applicable Codes</u>	
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Original Date: May 2003	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Imaging can assist in the diagnosis of TMJ dysfunction (TMD) when history and physical examination findings are equivocal.

INDICATIONS FOR TEMPOROMANDIBULAR JOINT (TMJ) MRI

Evaluation of Temporomandibular Disorders (TMD) ⁽¹⁾

Temporomandibular disorders (TMD) is an umbrella diagnostic term that encompasses the entire clinical spectrum of related jaw/facial dysfunction symptomatology. Imaging of the TMJ can be considered when the etiology of TMD is suspected to be an internal anatomic derangement within the joint

Suspected Internal TMJ Derangement

- Persistent symptoms of facial or jaw pain, restricted range of motion, pain and/or noise with TMJ function (i.e., chewing) ⁽²⁻⁴⁾ **AND**
- Conservative therapy with a trial of pharmacotherapy* **AND** behavioral modification** has been unsuccessful for at least four (4) weeks

*Pharmacotherapy typically includes analgesics, anti-inflammatories (NSAIDs), and/or muscle relaxants. In chronic cases, antidepressants and benzodiazepines may be used.

**Behavioral modification may include patient education, self-care, cognitive behavior therapy, physical therapy, and/or occlusal devices

Note: X-ray should be the initial study if there is recent trauma, dislocation, malocclusion, ⁽²⁾ or dental infection ⁽⁴⁾

Evaluation of Juvenile Idiopathic Arthritis (JIA) ^(4–6)

For initial evaluation or re-evaluation as indicated

Abnormal Initial X-ray or Ultrasound ^(1,2,4)

When additional imaging is needed.

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

Preoperative Evaluation ^(7,8):

- Imaging of the area requested is needed to develop a surgical plan

Post-Operative Evaluation ⁽⁸⁾

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section only applies within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS ON PRIOR IMAGING

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

CODING AND STANDARDS

Codes

70336

Applicable Lines of business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Diagnosis and treatment of temporomandibular disorders ⁽¹⁾

Study Design: The study focuses on the diagnosis and treatment of temporomandibular disorders (TMD). It includes a prospective cohort study with more than 6,000 participants.

Target Population: The study targets adults, with a peak incidence of TMD between 20 to 40 years of age. It is twice as common in women than in men.

Key Factors: TMD is multifactorial, including biologic, environmental, social, emotional, and cognitive triggers. Factors consistently associated with TMD include chronic headaches, fibromyalgia, autoimmune disorders, sleep apnea, and psychiatric illness. TMD is categorized as intra-articular (within the joint) or extra-articular (involving the surrounding musculature). Musculoskeletal conditions are the most common cause of TMD. Diagnosis is based on history and physical examination. Diagnostic imaging may be beneficial when malocclusion or intra-articular abnormalities are suspected. Most patients improve with noninvasive therapies, including patient education, self-care, cognitive behavior therapy, pharmacotherapy, physical therapy, and occlusal devices. Nonsteroidal anti-inflammatory drugs and muscle relaxants are recommended initially, and benzodiazepines or antidepressants may be added for chronic cases.

Recommendations for Imaging of the Temporomandibular Joint. Position Statement from the American Academy of Oral and Maxillofacial Radiology and the American Academy of Orofacial Pain⁽⁴⁾

Study Design: This position statement was developed by an ad hoc committee of the American Academy of Oral and Maxillofacial Radiology and the American Academy of Orofacial Pain. It provides evidence-based recommendations and clinical guidance for applying appropriate diagnostic imaging to evaluate the temporomandibular joint (TMJ).

Target Population: The study targets patients with temporomandibular disorders (TMDs), which include musculoskeletal and neuromuscular conditions involving the TMJs, masticatory muscles, and associated tissues.

Key Factors: Current modalities for TMJ imaging include panoramic radiography, CBCT, CT, and MRI. Each technique has specific applications and limitations. The statement provides detailed recommendations for imaging techniques based on the type of TMD, including odontogenic sources, arthritic diseases, developmental disorders, internal derangement, trauma, cysts, and neoplasms. The selection of imaging modality should consider the accuracy and adequacy of the imaging for the diagnostic task and its potential to provide information that contributes to diagnosis and management.

ANALYSIS OF EVIDENCE

Analysis^(1,4):

The evidence presented in both articles supports the use of MRI as a critical tool for diagnosing TMJ disorders, particularly for evaluating soft tissue components. However, "Mallya 2023" offers a more comprehensive and detailed guideline on the application of MRI, including specific recommendations for different TMJ conditions and the use of various MRI sequences.

In summary, while both articles agree on the value of MRI for TMJ diagnosis, "Mallya 2023" provides a more detailed and structured approach to its use, making it a more practical guide for clinicians. "Gauer 2015," on the other hand, offers a broader overview and emphasizes the importance of MRI in cases where other imaging modalities are inconclusive.

Shared Findings

Both articles emphasize the importance of MRI in diagnosing TMJ disorders due to its ability to provide detailed images of soft tissues, including the articular disc and joint effusion. They agree that MRI is superior to other imaging modalities like CT and CBCT for evaluating soft tissue components of the TMJ.

- **Soft Tissue Evaluation:** Both articles highlight that MRI is the only imaging technique that reliably shows the location, shape, and size of the articular disc. It also provides valuable information about the presence of fluid effusion within the joint.
- **Diagnostic Accuracy:** MRI is considered the optimal modality for comprehensive joint evaluation in patients with signs and symptoms of TMJ disorders. It has a high correlation with joint morphology in symptomatic patients.

POLICY HISTORY

Date	Summary
July 2025	Added a Summary of Evidence and Analysis of Evidence
June 2025	- This guideline number changed from 007 to 2055 - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Added additional pharmacotherapy for conservative treatment - Preoperative and postoperative section adjusted for clarity - Applicable line of business adjusted – Medicare checked - Removed background section
June 2024	- Updated references - Added Contraindications and Preferred Studies section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guideline 2008 for Brain Computed Tomography (CT)

Guideline Number: Evolent_CG_2008	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Brain Computed Tomography (CT) and Computed Tomography Angiography (CTA) are not approvable simultaneously unless they meet the criteria described below in the Indications for **Brain CT/Brain CTA** combination studies section. If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combination Studies** section for indicated combinations below)

Purpose

Computed tomography (CT) is an imaging technique used to view the structures of the brain and is useful in evaluating pathologies in the brain. It provides more detailed information on head trauma, brain tumors, stroke, and other pathologies in the brain than regular radiographs.

Important Note: Brain MRI is preferred to Brain CT in most circumstances where the patient can tolerate MRI and sufficient time is available to schedule the MRI examination. Assessment of subarachnoid hemorrhage, acute trauma, or bone abnormalities of the calvarium (fracture, etc.) may be better imaged with CT. CT is also appropriate in an urgent situation where MRI is not readily available (stroke, increased ICP, CNS infection).

INDICATIONS

Headache

Evaluation of Headache ^(1,2)

- Acute, sudden onset headache (< 4 weeks), with any ONE of the following (no contraindication to MRI is needed):
 - A personal or family history (brother, sister, parent, or child) of brain aneurysm or AVM (arteriovenous malformation)
 - < 48 hours of “worst headache in my life” or “thunderclap” headache (Sudden onset new headache reaching maximum intensity within 2-3 minutes, lasting more than 5 minutes)
 - Prior history of stroke or intracranial bleed
 - Known coagulopathy or on anticoagulation
- New onset headache (< 3 months with no prior history of headache) with any ONE of the following (no contraindication to MRI is needed):
 - Fever
 - Subacute head trauma
 - Acute, new, or fluctuating neurologic deficits, such as sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes or with signs of increased intracranial pressure (papilledema).
 - Migraine with atypical/complex aura (such as motor, brainstem or retinal auras which may be characterized by motor weakness, balance issues, vertigo, slurred speech, visional loss and/or double vision)
 - **NOTE:** Imaging is not indicated for typical migraine symptoms characterized by visual and/or sensory and/or speech/language symptoms AND the absence of motor, brainstem or retinal symptoms. Typical migraines develop gradually, last one hour or less and are completely reversible
 - Severe unilateral headache with radiation to or from the neck, associated with suspicion of carotid or vertebral artery dissection
- New onset headache with any ONE of the following when MRI is **contraindicated** or cannot be performed:
 - History of cancer or significantly immunocompromised
 - Age $\geq$ 50
 - Related to activity or event (sexual activity, exertion, Valsalva, position), new or progressively worsening ⁽³⁾
 - Persistent or progressively worsening during a course of physician-directed treatment ⁽¹⁾

- Chronic headache (>3 months) and any ONE of the following when MRI is **contraindicated** or cannot be performed:
 - Change in character or pattern (e.g. increased severity, frequency or duration)
- Cluster headaches or other trigeminal-autonomic cephalalgias (paroxysmal hemicrania, hemicrania continua, short-lasting unilateral neuralgiform headache attacks (SUNCT/SUNA)) once to eliminate secondary causes

Additional Indications in the Pediatric Population (<18) When None of the Above Apply ^(4,5)

- Persistent headache and any ONE of the following (no contraindication to MRI is needed)
 - Immune deficiency
 - History of neoplasm
 - History of congenital heart disease
 - Coagulopathy
 - See **Imaging in Known Genetic Conditions** for additional indications
- Persistent headache and any ONE of the following when MRI is **contraindicated** or cannot be performed:
 - Age < 6 years old
 - Occipital location
 - Documentation of absence of family history of headache
 - Concern for increased intracranial pressure with symptoms such as recurring headaches after waking

Neurological Symptoms or Deficits ^(6–10)

- Acute, new, fluctuating, or persistent neurologic symptoms or deficits such as, sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes.

Stroke and Vascular Disease

Evaluation of Known or Suspected Stroke ^(11,12)

- Suspected stroke with any acute, new, or fluctuating symptoms or deficits such as sensory deficits, limb weakness, speech difficulties, visual loss, lack of coordination, or mental status changes (see **Background**)
- History of stroke and ONE of the following:
 - No prior workup when MRI is **contraindicated** or cannot be performed
 - New neurologic signs or symptoms

- Suspected stroke with:
 - A personal or first-degree family history (brother, sister, parent, or child) of aneurysm OR
 - Known coagulopathy or on anticoagulation
- Symptoms of transient ischemic attack (TIA) (episodic neurologic symptoms such as sensory deficits, limb weakness, speech difficulties, visual loss, lack of coordination, or mental status changes) when MRI is **contraindicated** or cannot be performed
- See **Imaging in Known Genetic Conditions** section for additional indications (including for HbSS sickle cell disease or HbSβ0 thalassemia)

Evaluation of Known or Suspected Vascular Disease ⁽¹³⁾

- Evaluation of suspected acute subarachnoid hemorrhage (SAH)
- Follow-up for known hemorrhage, hematoma, or vascular abnormalities ⁽¹¹⁾
- Suspected central venous thrombosis and ANY ONE of the following when MRI is **contraindicated** or cannot be performed:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms when MRI is **contraindicated** or cannot be performed

Head Trauma

Evaluation of Known or Suspected Trauma ^(14,15)

- Known or suspected trauma or injury to the head with documentation of one or more of the following acute, new, or fluctuating:
 - Focal neurologic findings
 - Motor changes
 - Mental status changes
 - Amnesia
 - Vomiting
 - Seizures
 - Headache
 - Signs of increased intracranial pressure

- Known coagulopathy or on anticoagulation
- Known or suspected skull fracture by physical exam and/or prior imaging
- Repeat scan 24 hours post head trauma for anticoagulated patients with suspected diagnosis of delayed subdural hematoma
- Post concussive syndrome if persistent or disabling symptoms and imaging has not been performed
- Subacute or chronic traumatic brain injury with new cognitive and/or neurologic deficit when MRI is **contraindicated** or cannot be performed

Suspected Malignancy ^(16,17)

- Bone tumor or abnormality of the skull on prior imaging (CT or x-ray) ⁽¹⁸⁾
- Suspected brain tumor with any acute, new, or fluctuating neurologic symptoms or deficits such as sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes when MRI is **contraindicated** or cannot be performed
- Lesion on prior imaging with atypical features when MRI is **contraindicated** or cannot be performed

Note: For pituitary disorders, if MRI is contraindicated or cannot be performed (see Evolent CG 2054 for Temporal Bone, Mastoid, Orbits, Sella, Internal Auditory Canal CT for Sella CT or Evolent CG 2012 for Brain MRI for indications)

Known Malignancy

MRI is the ideal modality to follow-up meningioma, pituitary tumors, low grade tumors, neurocutaneous syndromes, and screening/restaging/surveillance for non-CNS cancers. CT should only be used when MRI is **contraindicated** or cannot be performed (see ECG 2012 for Brain MRI for indications)

Seizure Disorders

Evaluation of Known or Suspected Seizure Disorder

When MRI is contraindicated or cannot be performed ⁽¹⁹⁾

- New onset of unprovoked seizure ⁽²⁰⁾
- Newly identified change in seizure activity/pattern

Infection and Inflammation

Evaluation of Known or Suspected Infection or Inflammatory Disease

When MRI is contraindicated or cannot be performed ⁽²¹⁾

- Suspected intracranial abscess or brain infection with acute altered mental status or with positive lab findings (such as elevated WBCs) **OR** follow-up assessment during or after

treatment completed.

- Meningitis with positive signs and symptoms (such as fever, headache, mental status changes, stiff neck) **OR** with positive lab findings (such as elevated white blood cells or abnormal lumbar puncture fluid exam)
- Suspected encephalitis with headache and altered mental status or follow-up as clinically warranted
- Endocarditis with suspected septic emboli
- Vasculitis
 - Central Nervous System (CNS) involvement in patients with known or suspected vasculitis or autoimmune disease with abnormal inflammatory markers or autoimmune antibodies
 - Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up when MRI is contraindicated or cannot be performed ⁽²²⁾
- Immunocompromised patient (e.g., transplant recipients, HIV with CD4<200, primary immunodeficiency syndromes, hematologic malignancies) with focal neurologic symptoms, headaches, behavioral, cognitive or personality changes

Evaluation of Cognitive Impairment

When MRI is contraindicated or cannot be performed ^(23,24)

- Evaluation for mild cognitive impairment or dementia with all of the following:
 - Objective measures demonstrate impairment (MMSE/MoCA < 26 or other mental status instruments (see **Background**) or mild cognitive impairment on neuropsychological testing)
 - Full lab evaluation (thyroid function tests, CBC, CMP, and B12) has been completed and if abnormal, has been treated and the cognitive difficulty persists

Movement Disorders ^(7,25)

- For evaluation of acute onset of a movement disorder with concern for stroke or hemorrhage
- For evaluation of suspected Parkinson's with atypical features or unresponsive to levodopa when MRI is **contraindicated** or cannot be performed

Note: Atypical parkinsonian syndromes include progressive supranuclear palsy (PSP), multiple system atrophy (MSA), corticobasal degeneration (CBD), and dementia with Lewy bodies.

- For the evaluation of other movement disorders to exclude a structural lesion (i.e., suspected Huntington disease, chorea, hemiballismus, atypical dystonia)

Note: Imaging is not indicated in essential tremor, Tourette' syndrome or isolated focal dystonia (e.g., blepharospasm, cervical dystonia, laryngeal dystonia, oromandibular

dystonia, writer's dystonia) ^(25,26)

Cranial Nerve and Vision Abnormalities

Vision Abnormalities

When MRI is contraindicated or cannot be performed

- Abnormal eye findings on physical or neurologic examination that suggest CNS pathology (such as papilledema, pathologic nystagmus, optic atrophy, ocular nerve palsies, new onset anisocoria, visual field deficits) ⁽⁸⁾
- Binocular diplopia with concern for CNS pathology after comprehensive eye evaluation ⁽⁸⁾
- Horner's syndrome with signs/symptoms localizing the lesion to the brain (vertigo, altered facial sensation, contralateral CN IV palsy, crossed motor/sensory signs) ^(27,28)

Other Cranial Nerve Disorders ^(1,29)

When MRI is contraindicated or cannot be performed

- Trigeminal (CN V) neuralgia or neuropathy
- Occipital Neuralgia with atypical features (such as burning versus stabbing pain, referred pain to the face/ear, tinnitus, visual disturbances) to exclude a structural lesion ⁽³⁰⁾
- Hemifacial spasm (CN VII)
- Facial Nerve Paresis / Bell's Palsy (CN VII) with atypical features (such as bilateral involvement, multiple episodes, slow resolution beyond three weeks, incomplete/no improvement at three months, or facial twitching/spasms prior to onset) ^(29,31–33)
- Clinical evidence of cranial nerve (CN IX, X, XI, and/or XII) deficits or dysfunction (such as dysphagia, shoulder/neck movement abnormalities, tongue movement abnormalities, vocal fold movement or sensation abnormalities)
- Bulbar symptoms (such as difficulty in chewing, dysarthria, dysphagia, and dysphonia) and/or bulbar signs (such as atrophy and fasciculations of the tongue, weakness of the facial muscles, palatal weakness, absent gag reflex) ⁽²⁹⁾
- Pseudobulbar symptoms (such as dysphagia, dysarthria, sudden stereotyped emotional outbursts that are not reflective of mood) and/or pseudobulbar signs (such as spastic tongue, facial weakness, exaggerated gag/jaw jerk) ⁽³⁴⁾

Congenital Abnormalities

- Evaluation of Known or Suspected Congenital Abnormalities
 - Known or suspected congenital abnormality with any acute, new, or fluctuating neurologic, motor, or mental status changes
 - Craniosynostosis and other skull deformities ⁽³⁵⁾
 - Prior treatment **OR** treatment planned for congenital abnormality

- Evaluation of Known or Suspected Congenital Abnormalities **when MRI is contraindicated or cannot be performed**
 - Evaluation of macrocephaly in an infant/child <18 with previously abnormal US, abnormal neurodevelopmental examination, signs of increased ICP or closed anterior fontanelle ⁽³⁶⁾
 - Evaluation of microcephaly and age < 18 years old ⁽³⁷⁾
 - Cerebral palsy and ONE of the following ⁽³⁸⁾:
 - Etiology has not been established in the neonatal period
 - There is change in the expected clinical or developmental profile and concern for progressive neurological disorder
 - See **Imaging in Known Genetic Conditions** section for additional indications

Note: For evaluation of known or suspected hydrocephalus see section on CSF abnormalities, below.

Cerebrospinal Fluid Abnormalities

- Evaluation of Known or Suspected CSF Abnormalities
 - Evaluation of suspected hydrocephalus with any acute, new, or fluctuating neurologic, motor, or mental status changes
 - Follow up of known hydrocephalus with new symptoms or to plan/monitor treatment
 - Known or suspected normal pressure hydrocephalus (NPH) ⁽³⁹⁾
 - With symptoms of gait difficulty, cognitive disturbance, and/or urinary incontinence
 - Follow-up shunt evaluation and ONE of the following ⁽⁴⁰⁾
 - Baseline imaging following placement or revision
 - 6-12 months after placement or revision
 - Clinical concern for shunt malfunction
 - Evaluation of known or suspected cerebrospinal fluid (CSF) leakage ⁽⁴¹⁾
 - Cisternography for intermittent and complex CSF rhinorrhea/otorrhea (CSF fluid should always be confirmed with laboratory testing (Beta-2 transferrin assay first) ^(41,42)
- Evaluation of Known or Suspected CSF Abnormalities **when MRI is contraindicated or cannot be performed**
 - For initial evaluation of a suspected Arnold Chiari malformation ^(43,44)
 - Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ⁽⁴³⁻⁴⁵⁾
 - Known syrinx or syringomyelia
 - Suspected spontaneous intra-cranial hypotension with distinct postural headache

(other symptoms include nausea, vomiting, dizziness, tinnitus, diplopia, neck pain or imbalance) ^(1,46)

Other Indications

- Prior to lumbar puncture in patients with suspected increased intracranial pressure or at risk for herniation

Other Indications when MRI is contraindicated or cannot be performed

- Vertigo associated with any ONE of the following ⁽⁶⁾
 - Signs or symptoms suggestive of a possible CNS lesion (such as a positive HINTS test, ataxia, dysarthria, visual loss, double vision, weakness, mental status change, hearing loss, tinnitus or a change in sensation)
 - Progressive unilateral/asymmetric hearing loss and/or tinnitus
 - Concern for stroke with known risk factors for cerebrovascular disease (such as hypertension, smoking, obesity, hypercholesterolemia)
 - Concern for central vertigo (source within the CNS) based on findings on neurologic examination and/or vestibular testing (such as skew deviation, vertical nystagmus, head thrust test, and/or videonystagmography (VNG) / electronystagmography (ENG) testing results suggesting a likely CNS etiology)

NOTE: “Vertigo” is the sensation that a person and/or their surroundings are moving. There are many vague, nonspecific terms that are often used instead including “dizzy”, “light-headed”, “woozy”, “groggy”, or “giddy”. The reviewer should examine the record to determine if the patient is experiencing vertigo or another condition (such as presyncope, ataxia, anxiety, arrhythmia). If it is not clear what condition is being described, clarification should be requested.

- Diagnosis of central sleep apnea on polysomnogram
 - Children > 1 year ⁽⁴⁷⁾
 - Adults in the absence of heart failure, chronic opioid use, high altitude, or treatment emergent central sleep apnea **AND** concern for a central neurological cause (Chiari malformation, tumor, infectious/inflammatory disease) **OR** with an abnormal neurological exam
- Syncope with documented clinical concern for seizure or associated neurological signs or symptoms ⁽⁴⁸⁾
- Cyclical vomiting syndrome or abdominal migraine with any localizing neurological symptoms ^(49,50)
- Psychological changes with neurological deficits on exam or after completion of a full neurological assessment that suggests a possible neurologic cause ⁽⁵¹⁾
- Child < 18 years with global developmental delay **OR** a developmental delay with abnormal neurological examination or abnormal EEG ⁽⁵²⁾

- Unexplained event (BRUE) formerly apparent life-threatening event (ALTE) in infants < 1 year with concern for neurological cause based on history and exam ⁽⁵³⁾

Note: Imaging is not indicated in low-risk patients

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS ON PRIOR IMAGING

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Achondroplasia ⁽⁵⁴⁾:
 - Once (to evaluate the corticomedullary junction; typically done in infancy)
- Sickle Cell Disease ^(55,56):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s

Combination Studies for Imaging in Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is

required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Brain CT and Brain CTA

- Sickle Cell Disease ^(55,56):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s
 - New neurologic or cognitive concerns (including TIA, no formal testing required)
 - When cessation or changing frequency of transfusions is under consideration

OTHER COMBINATION STUDIES WITH BRAIN CT

Note: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Note: These body regions might be evaluated separately or in combination as documented in the clinical notes by physical examination findings (e.g., localization to a particular segment of the neuroaxis), patient history, and other available information, including prior imaging.

Brain CT and Brain CTA

- Recent ischemic stroke
- Recent transient ischemic attack (TIA) when MRI is contraindicated or cannot be performed ^(11,57)
- Acute, sudden onset of headache with personal history of a vascular abnormality or first-degree family history of aneurysm ^(1,13)
- Thunderclap headache >6 hours after onset in an acute setting with high suspicion of SAH ⁽¹⁾
- Headache associated with exercise, exertion, or sexual activity when MRI is contraindicated or cannot be performed ⁽²⁾
- Suspected central venous thrombosis and MRI is contraindicated or cannot be performed and ANY ONE of the following ⁽¹¹⁾:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or Covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- Known Moyamoya disease ^(12,58) or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms ^(1,59)

- **NOTE:** For this indication, when Brain CT is ordered in combination with Brain CTA, a contraindication to MRI is not needed
- Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies when MRI is contraindicated or cannot be performed ⁽¹³⁾
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up when MRI is contraindicated or cannot be performed ^(13,22,60)

Brain CT and Brain/Neck CTA ^(11,12)

- Recent ischemic stroke
- Recent transient ischemic attack (TIA) when MRI is contraindicated or cannot be performed ^(11,57)
- History of stroke and ONE of the following:
 - No prior workup when MRI is contraindicated or cannot be performed
 - New neurologic signs or symptoms
- Suspected or known carotid or vertebral artery dissection with focal or lateralizing neurological deficits

Note: MRA and CTA are generally comparable noninvasive imaging alternatives, each with their own advantages and disadvantages. Brain MRI can alternatively be combined with Brain CTA/Neck CTA.

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or CANNOT be performed or surgeon preference

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ⁽⁴³⁾
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁶⁾
 - Drop metastasis from brain or spine (CT spine imaging in this scenario is usually CT myelogram)
 - Suspected leptomeningeal carcinomatosis
 - Tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula (CT myelogram)) ⁽⁶¹⁾

Brain/Orbit CT (8,62)

- If MRI is contraindicated or cannot be performed:
 - Optic neuropathy or unilateral optic disk swelling of unclear etiology to distinguish between a compressive lesion of the optic nerve, optic neuritis, ischemic optic neuropathy (arteritic or non-arteritic), central retinal vein occlusion, or optic nerve infiltrative disorders
 - Bilateral optic disk swelling (papilledema) with vision loss

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine

CODING AND STANDARDS

Codes

70450, 70460, 70470, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on

trimester).

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

Computed Tomography (CT) versus Magnetic Resonance Imaging (MRI)

Generally, magnetic resonance imaging is the preferred imaging technique for evaluating the brain parenchyma, and CT is preferable for evaluating subarachnoid hemorrhage. CT is faster and more readily available than MRI and is often used in urgent clinical situations.

Stroke/TIA

Imaging for Stroke – Individuals presenting with symptoms of acute stroke should receive prompt imaging to determine whether they are candidates for treatment with tissue plasminogen activator. Non-contrast CT can evaluate for hemorrhage that would exclude the individual from reperfusion therapy.

Memory Status Instruments

Cut off values for cognitive impairment

Mini-Cog < 3

Memory Impairment Screen < 5

Saint Louis University Mental Status Examination (SLUMS)

- High school education <27
- Less than high school education <25

Brief Alzheimer's Screen (BAS) <24

Blessed Dementia Scale (BDS) >3

Clinical Dementia Rating

- Sum of boxes score > or equal to 4.5 or
- Global score greater than or equal to 1 Mo

Montreal Cognitive Assessment (MoCA) < 26

Mini-Mental Status Exam (MMSE) < 26

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Cerebrovascular Diseases-Aneurysm, Vascular Malformation, and Subarachnoid Hemorrhage ⁽¹³⁾

Study Design: The study design involves a detailed literature review and expert panel recommendations to establish imaging guidelines for various cerebrovascular conditions. The criteria are based on the latest evidence and expert consensus to ensure appropriate imaging procedures are selected for different clinical scenarios.

Target Population: The target population includes patients with cerebrovascular diseases such as aneurysms, vascular malformations, and SAH. Specific variants address different clinical presentations, including known acute SAH, suspected cerebral vasospasm, untreated cerebral aneurysms, previously treated cerebral aneurysms, high-risk cerebral aneurysm screening, known high-flow vascular malformations, and suspected CNS vasculitis.

Key Factors:

Imaging Recommendations: The document outlines the appropriateness of various imaging modalities, including arteriography, CTA, MRA, MRI, and ultrasound, for different clinical scenarios. Each variant provides specific recommendations based on the clinical presentation and the relative radiation level associated with each imaging procedure.

Clinical Presentations: The criteria cover a wide range of clinical presentations, from acute SAH to surveillance monitoring of untreated and treated aneurysms, as well as screening for high-risk populations and evaluation of suspected CNS vasculitis.

Expert Panel: The recommendations are developed by an expert panel on neurological imaging, including specialists from various institutions and organizations. The panel's collaboration ensures a comprehensive and well-rounded approach to imaging guidelines.

Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition ⁽²⁾

Study Design: The ICHD-3 is a systematic classification of headache disorders based on extensive research and clinical studies. The classification is hierarchical, allowing for detailed diagnosis from the first-digit level to the fifth. The criteria for each headache type are based on clinical features, diagnostic criteria, and evidence from field-testing studies.

Target Population: The target population includes individuals experiencing various types of headaches, ranging from primary headaches like migraines and tension-type headaches to secondary headaches attributed to other disorders. The classification is intended for use by healthcare professionals, including neurologists, general practitioners, and researchers, to diagnose and manage headache disorders.

Key Factors:

Primary Headaches: The document classifies primary headaches into categories such as migraines, tension-type headaches, and trigeminal autonomic cephalalgias. Each category includes specific diagnostic criteria, clinical features, and comments on pathophysiology and treatment.

Secondary Headaches: These are headaches attributed to other disorders, such as trauma, vascular disorders, infections, and psychiatric disorders. The classification provides criteria for diagnosing secondary headaches based on the temporal relationship between the headache and the underlying disorder.

Diagnostic Criteria: The criteria for each headache type include the number of attacks, duration, pain characteristics, associated symptoms, and exclusion of other diagnoses. For example, migraine without aura requires at least five attacks lasting 4-72 hours with specific pain characteristics and associated symptoms like nausea and photophobia.

Field Testing: The classification includes results from field-testing studies that validate the diagnostic criteria. These studies involve large populations and use advanced diagnostic methods like neuroimaging and genetic testing.

Clinical and Research Applications: The ICHD-3 is designed for both clinical practice and research. It helps clinicians diagnose and manage headache disorders and provides a standardized framework for researchers to study headache epidemiology, pathophysiology, and treatment.

ACR Appropriateness Criteria® Cerebrovascular Diseases-Stroke and Stroke-Related Conditions ⁽¹¹⁾

Study Design: The document is a guideline developed by the American College of Radiology (ACR) Appropriateness Criteria Expert Panel on Neurological Imaging. It is based on a systematic analysis of medical literature from peer-reviewed journals and follows established methodology principles such as the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) and the RAND/UCLA Appropriateness Method.

Target Population: The guidelines are intended for use by radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment for patients with cerebrovascular diseases, including stroke and stroke-related conditions.

Key Factors:

Conditions Covered: The guidelines encompass a wide range of cerebrovascular diseases, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, and cerebral venous sinus thrombosis. They also address complications such as intraparenchymal hemorrhage and completed ischemic strokes.

Imaging Recommendations: The document provides evidence-based guidelines for appropriate imaging examinations for diagnosis and treatment of specified medical conditions. It includes recommendations for various imaging modalities such as CT, MRI, MRA, and ultrasound.

Clinical Scenarios: The guidelines cover different clinical scenarios, including transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage, among others.

Methodology: The guideline development and revision process involves a multidisciplinary expert panel and supports the systematic analysis of medical literature. In instances where peer-reviewed literature is lacking or equivocal, expert opinions are used to formulate recommendations.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(2,11,13):

1. **Diagnostic Imaging:** All three articles emphasize the importance of diagnostic imaging in identifying and managing cerebrovascular conditions. They discuss various imaging modalities such as CT, MRI, MRA, and CTA, highlighting their roles in diagnosing conditions like stroke, aneurysms, and vascular malformations.
2. **Clinical Guidelines:** The articles provide clinical guidelines for the management of cerebrovascular diseases. They stress the need for evidence-based approaches and the use of standardized criteria to ensure accurate diagnosis and effective treatment.
3. **Risk Factors:** Each article discusses the risk factors associated with cerebrovascular diseases, including hypertension, smoking, and genetic predispositions. They highlight the importance of identifying these risk factors to prevent and manage conditions effectively.

POLICY HISTORY

Date	Summary
July 2025	- Fixed a typo in the Neurological Symptoms or Deficits section - Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	- Guideline name changed from Brain CT to Brain Computed Tomography (CT) - Guideline number changed from 002 to 2008 - Added new bullet-point to the General Statement section - Updated Imaging in Known Genetic Conditions section - Checked the Medicare Advantage box in the Applicable Lines of Business table - Added a Summary of Evidence and Analysis of Evidence - Updated references - Updated background - Updated combination section - Reorganized tumor section Clarified: - Acute and chronic HA timeframes

Date	Summary
	• Migraine aura • CVT • Cognitive impairment labs • Horner's syndrome • Follow-up shunt evaluation • Vertigo Added: • Genetic section • History of stroke • Other cranial nerve disorders to mirror Brain MRI guideline Removed: • Childhood strabismus
June 2024	• Updated references • Updated background section • Updated combination section <u>Added</u> • Updated Cancer sections • Vertigo with progressive unilateral hearing loss or tinnitus • Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms (also to (Brain CT /CTA combo) • Thunderclap headache >6 hours after onset in an acute setting with high suspicion of SAH (Brain CT/CTA combo) <u>Deleted</u> • Tumor monitoring in neurocutaneous syndromes • Pulsatile tinnitus combo section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2047 for Sinus Maxillofacial Computed Tomography (CT)

Guideline Number: Evolent_CG_2047	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Sinus/Maxillofacial Computed tomography (CT) primarily provides information about bony structures but may also be useful in evaluating soft tissue masses. It can help document the extent of facial bone fractures, facial infections, masses and abscesses. The primary role of CT scans is to aid in the diagnosis and management of recurrent and chronic sinusitis, or to define the anatomy of the sinuses prior to surgery.

Special Note

- A single authorization for CPT codes 70486, 70487, or 70488 includes imaging of the entire maxillofacial area, including face and sinuses. Multiple authorizations are not required.
- Cone Beam CT is an alternative mechanism to acquire imaging data of the maxillofacial anatomic area often obtained at the point of care and can be used for any of the indications below.
- CT (or Cone Beam) imaging of dental diagnoses (such as tooth abscess, dental caries, wisdom tooth removal, dental implant planning) without an associated medical diagnosis is **NOT** indicated
- See legislative language for specific mandates in the State of Washington

INDICATIONS

Infection and Inflammation

Rhinosinusitis

- Clinical suspicion of any type of fungal infection of the nasal cavity and/or paranasal sinuses including ⁽¹⁾:
 - Invasive fungal infection
 - Allergic fungal sinusitis
 - Mycetoma (“fungus ball”)
- Clinical suspicion of a complication of rhinosinusitis including any **ONE** of the following ⁽¹⁾:
 - Any facial or orbital swelling (including forehead and upper jaw)
 - Any visual deficits or eye movement abnormalities
 - Any cranial nerve deficits
 - Suspected intracranial infection
 - Suspected Osteomyelitis ⁽²⁾
 - Suspected cavernous sinus thrombosis

NOTE: Prior medical therapy is **NOT** required if there is a suspected complication of rhinosinusitis

- Acute (≤ 4 weeks duration) rhinosinusitis
- Not responding to medical management (see **Background** for details regarding medical management) including 2 or more courses of antibiotics Recurrent acute rhinosinusitis with **ALL** of the following:
 - 4 or more annual episodes of acute sinusitis without persistent symptoms or abnormal exam findings in-between acute episodes ⁽³⁾
 - Not responding to **medical management** including 2 or more courses of antibiotics
- Subacute (4-12 weeks duration) rhinosinusitis ⁽³⁾
 - Not responding to **medical management** including 2 or more courses of antibiotics
- Chronic rhinosinusitis (> 12 weeks duration) with **ALL** of the following ⁽³⁾
 - Not responding to **medical management** including 2 or more courses of antibiotics
 - at least two of the following symptoms:
 - Mucopurulent discharge (anterior and/or posterior)
 - Nasal obstruction and congestion
 - Facial pain, pressure, and fullness
 - Decreased or absent sense of smell

Immune System Deficiency ⁽³⁾

- Rhinosinusitis in a patient with a documented condition with relative immunodeficiency (such as IgG deficiency, IgA deficiency, severe combined immunodeficiency (SCID),

cystic fibrosis, immotile cilia disorders, HIV, undergoing chemotherapy, poorly controlled diabetes)

Rhinosinusitis from a Dental Source (Odontogenic infection) ⁽⁴⁾

- Suspected paranasal sinus infection (typically a unilateral maxillary sinus infection) from a nearby dental source

NOTE: CT (or Cone Beam) imaging of a dental diagnoses (such as tooth abscess, dental caries, wisdom teeth removal, dental implant planning) without an associated medical diagnosis is **NOT** indicated ⁽¹⁾

Nasal Polyposis ⁽³⁾

- Nasal polyps (unilateral or bilateral) noted on physical exam and/or endoscopy
- History of prior treatment of nasal polyps (medical or surgical) and suspicion for recurrence of nasal polyps based on symptoms (such as nasal obstruction, loss of sense of smell/taste)

Allergic Rhinitis ^(3,5)

- Advanced imaging for allergic rhinitis is **ONLY** indicated with any **ONE** of the following:
- Acute, subacute, or chronic rhinosinusitis not responding to **medical management** including 2 or more courses of antibiotics
- Structural abnormality (such as nasal septal deviation, enlarged inferior turbinates) visible on nasal exam and/or nasal endoscopy and surgical correction is planned **OR** is being considered
- Nasal polyps (unilateral or bilateral) noted on physical exam including endoscopy

Refractory Reactive Airway Disease (Asthma)

- Severe, refractory asthma with concurrent chronic rhinosinusitis and invasive therapy (Such as endoscopic sinus surgery, balloon sinuplasty) for rhinosinusitis is being considered to aid in the management of both rhinosinusitis and asthma ⁽³⁾

Salivary Gland Infection/Inflammation (Sialadenitis) ^(6,7)

- After prior indeterminate or abnormal imaging
- Clinical concern for abscess formation (such as facial swelling, visualized purulence from salivary duct)
- Suspected or known salivary gland stones
- Bilateral salivary gland involvement
- Recurrent acute infection of the salivary gland(s)

Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) ⁽⁸⁾

- Advanced imaging for GPA is indicated with any **ONE** of the following:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

NOTE: Imaging of the Neck, Chest, and/or Abdomen may also be indicated for GPA as involvement of the airway, lungs, and/or kidneys is common

Osteonecrosis of the Mandible / Maxilla ⁽⁹⁾

- Clinical concern for osteonecrosis of the maxilla and/or mandible especially with known predisposing conditions (such as prior radiation therapy, dental procedures, uncontrolled diabetes, bisphosphonate medications)

Known or Suspected Structural Abnormalities

- CT imaging is indicated when surgical correction is planned **OR** is being considered for any **ONE** of the following possible structural abnormalities:
 - Nasal septal deviation
 - Nasal septal perforation
 - Nasal valve collapse
 - Nasal polyps (unilateral or bilateral)
 - Nasal dorsal hump deformity
 - Saddle Nose Deformity
 - Enlarged inferior turbinate(s) – after failed prior medical therapy with topical intranasal steroids, antihistamines, and/or allergy immunotherapy
 - Concha bullosa (air cell formation within a nasal turbinate bone causing nasal obstruction)
 - Choanal stenosis or choanal atresia
 - Pyriform aperture stenosis
 - Cleft palate/Cleft lip
 - Facial pits/clefts
 - Protruding eyes (exophthalmos) – often associated with Grave's Thyroid Disease

Sinonasal/Facial Mass or Neoplasm

- Known or suspected sinonasal/facial mass/neoplasm based on **ONE** (or more) of the following:

- Physical exam
- Nasal endoscopy
- Prior imaging ^(1,3)
- Suspicion of recurrence following surgical excision
- Further evaluation of a known sinonasal/facial mass/neoplasm visualized on exam, nasal endoscopy, or prior imaging
- Known or suspected salivary gland neoplasm (parotid, submandibular, and/or sublingual gland) after prior indeterminate or abnormal imaging

NOTE: Ultrasound is the initial imaging study of a salivary gland mass. Fine needle aspiration (FNA) is usually the next step in the evaluation of a possible salivary gland malignancy and advanced imaging is not typically needed prior to biopsy

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁰⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when it is documented that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as orbit, nasopharynx, base of tongue, hypopharynx, pyriform sinus)

NOTE: CT/MRI of Neck, Orbit, or PET may also be indicated

Facial Trauma ^(11,12)

- History of recent facial trauma and any **ONE** of the following signs / symptoms:
 - Double vision (diplopia)
 - Eye movement abnormalities
 - Sunken eye (enophthalmos)
 - Protruding eye (exophthalmos)
 - Persistent clear nasal drainage (possible CSF leak)
 - Nasal deformity
 - Facial paresthesia
 - Inability to open jaw (trismus)
 - Malocclusion (teeth not fitting together correctly)
 - Palpable bony defect (step off)
- Nasal fracture CT imaging for isolated nasal fracture is indicated with **ALL** of the

following:

- Visible / palpable deformity of the external nose **OR** disruption of the internal structures of the nasal cavity (such as septal deviation)
- Surgical correction is planned **OR** is being considered
- Suspected facial bone fracture with prior indeterminate or abnormal imaging
- Further evaluation of a known facial fracture for treatment planning

Cranial Nerve Abnormalities

Anosmia, Hyposmia, or Dysosmia (CN I) ^(1,13,14)

- Advanced imaging for anosmia (complete loss of smell), hyposmia (reduced sense of smell) or dysosmia (abnormal sense of smell) is indicated with **ALL** of the following:
 - Persistent symptoms (generally considered to be 4 weeks or more)
 - Unknown origin (if related to known concurrent rhinosinusitis, the indication for advanced imaging should meet the specific rhinosinusitis criteria)
 - Nasal endoscopy completed with indeterminate or abnormal findings **OR** nasal endoscopy documented as unavailable

Trigeminal Neuralgia/Neuropathy (CN V) ⁽¹⁵⁾

If MRI is contraindicated or cannot be performed

- Suspected trigeminal neuralgia/neuropathy with atypical features requiring evaluation of the extracranial course of the trigeminal nerve (such as bilateral involvement, hearing loss, dizziness/vertigo, visual changes, sensory loss, pain > 2 min, pain outside trigeminal nerve distribution, progression)

NOTE: MRI of the brain (or CT of the head if MRI is contraindicated or not available) with complete imaging of the entire course of the trigeminal nerve is the preferred initial study for trigeminal neuralgia/neuropathy

Facial Nerve Paresis/Bell's Palsy/Hemifacial Spasm (CN VII) ^(16,17)

If MRI is contraindicated or cannot be performed

- Facial nerve paresis/ Bell's palsy / hemifacial with atypical features requiring evaluation of the extracranial course of the facial nerve (Such as incomplete/no improvement at three months, involvement of only specific branches of the facial nerve, second paralysis of the same side, or facial twitching/spasms prior to onset)

NOTE: MRI Brain with internal auditory canal (IAC) (or CT Temporal Bone if MRI is contraindicated or not available) with imaging of the intracranial course of the facial nerve is the preferred initial study for facial nerve paresis/ Bell's palsy / hemifacial spasm

Cerebral Spinal Fluid (CSF Rhinorrhea)

- CT sinus / Maxillofacial imaging for possible CSF rhinorrhea is indicated with any **ONE** of the following ⁽¹⁾:
 - High index of suspicion of CSF leak based on clinical evidence (such as consistent nasal leaking, worse leaking with provocative maneuvers (Valsalva), positive Beta-2 transferrin assay of the leakage)
 - Prior imaging (such as MRI, nuclear medicine imaging) suggesting bony defect/lesion contributing to suspected/known CSF leak

Epistaxis (Nosebleeds)

- Advanced imaging for epistaxis is **ONLY** indicated with any **ONE** of the following:
 - Mass / lesion visible on nasal exam and/or nasal endoscopy
 - Structural abnormality (such as nasal septal deviation, nasal septal perforation) visible on nasal exam and/or nasal endoscopy and surgical correction is planned **OR** is being considered

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- CT sinus / maxillofacial is indicated prior to **ANY** of the following specific procedures:
 - Any procedure with planned intra-operative surgical navigation (computer guidance to navigate the anatomic structures of the nasal cavity or paranasal sinuses)
 - Pituitary gland procedures (a trans nasal approach to the pituitary gland is typically used)
 - Maxillo-mandibular advancement (or other similar procedures with surgical bone manipulation) for the management of obstructive sleep apnea (OSA)
 - Eustachian tube procedures (such as balloon dilation)
 - Bone marrow transplant
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- When imaging, physical, or laboratory findings indicate surgical or procedural complications
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

OTHER COMBINATION STUDIES WITH SINUS MAXILLOFACIAL CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Neck/Face/Sinus/Orbit CT and PET

- Suspected or known malignancy of the head and neck with any **ONE** of the following ⁽¹⁰⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when it is documented that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as orbit, nasopharynx, base of tongue, hypopharynx, pyriform sinus)

Sinus/Maxillofacial/Neck/Chest/Abdomen CT

- Advanced imaging for Granulomatosis with polyangiitis (formally known as Wegener's granulomatosis) disease (GPA) ⁽⁸⁾

Sinus/Chest/Abdomen and Pelvis CT and Brain MRI

- Prior to Bone Marrow Transplantation

LEGISLATIVE LANGUAGE

Washington

20150515A – Imaging for Rhinosinusitis ⁽¹⁸⁾

**Washington State Health Care Authority Technology Assessment
Health Technology Clinical Committee**

HTTC Coverage Determination:

Imaging for Rhinosinusitis is a **covered benefit with conditions** consistent with the criteria identified in the reimbursement determination.

HTCC Reimbursement Determination:

Limitations of Coverage

Imaging with Sinus Computed Tomography (CT) is covered in the context of rhinosinusitis for the following:

- Red Flags* OR
- Persistent Symptoms** > 12 weeks AND failure of medical therapy; OR
- Surgical planning.
- Repeat scanning is not covered except for Red Flags or Surgical Planning.

Magnetic Resonance Imaging (MRI) of the sinus is covered in the context of rhinosinusitis for the following:

- As above for sinus CT AND < 18 years of age OR pregnant.

***Red Flags in the setting of Rhinosinusitis:** (From American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS))

- Swelling of orbit
- Altered mental status
- Neurological findings
- Signs of meningeal irritation
- Severe headache
- Signs of intracranial complication, including, but not limited to:
 - Meningitis,
 - Intracerebral abscess
 - Cavernous sinus thrombosis
- Involvement of nearby structures, including, but not limited to:
 - Periorbital cellulitis

****Persistent Symptoms defined as $\geq$ two of the following:** (From AAO-HNS)

- Facial pain-pressure-fullness
- Mucopurulent drainage
- Nasal obstruction (congestion)
- Decreased sense of smell

Non-Covered Indicators

- Imaging of the sinus for rhinosinusitis using X-ray OR Ultrasound is not covered.

CODING AND STANDARDS

Codes

70486, 70487, 70488, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Rhinosinusitis

Society consensus recommendation is to not order sinus computed tomography (CT) or indiscriminately prescribe antibiotics for uncomplicated, acute rhinosinusitis. Most acute rhinosinusitis resolves without treatment within two weeks. Uncomplicated acute rhinosinusitis is generally diagnosed clinically and does not require imaging.

- Appropriate medical therapy for acute, subacute, or chronic rhinosinusitis includes **ANY** of the following:
 - Topical nasal saline (irrigation, spray, or infused with a mechanical device)
 - Topical nasal steroids
 - Topical antihistamine

- Topical decongestants
- Oral decongestants
- Oral antihistamines
- Oral leukotriene inhibitors
- Oral steroids
- Oral antibiotics
- Topical antibiotics (not FDA approved but many studies showing efficacy)
- Pharmacy compounded sinus rinses (antibiotics, steroids, xylitol)
- Biologics

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Sinonasal Disease: 2021 Update ⁽¹⁾

Study Design: This document presents guidelines for initial imaging utilization in patients with sinonasal disease, including acute rhinosinusitis, chronic rhinosinusitis, and suspected invasive fungal sinusitis.

Target Population: Patients presenting with sinonasal disease.

Key Factors: The guidelines are evidence-based and reviewed annually by a multidisciplinary expert panel. CT and MRI are the primary imaging modalities recommended for evaluating sinonasal disease. The document provides specific recommendations for imaging procedures based on different clinical scenarios, such as acute uncomplicated rhinosinusitis, suspected orbital or intracranial complications, and suspected sinonasal mass.

Clinical Practice Guideline (Update): Adult Sinusitis ⁽³⁾

Study Design: This document is an update of a 2007 guideline from the American Academy of Otolaryngology—Head and Neck Surgery Foundation. It provides evidence-based recommendations for managing adult rhinosinusitis, including acute bacterial rhinosinusitis (ABRS) and chronic rhinosinusitis (CRS).

Target Population: Adults with a clinical diagnosis of uncomplicated rhinosinusitis.

Key Factors: The guideline includes evidence from 42 new systematic reviews and 70 randomized controlled trials. It emphasizes patient education, counseling, and the judicious use of systemic and topical therapy. The update introduces new recommendations for managing CRS, including the use of saline nasal irrigation and topical intranasal corticosteroids. It also highlights the importance of distinguishing between viral and bacterial rhinosinusitis to avoid unnecessary antibiotic use.

ACR Appropriateness Criteria® Head Trauma: 2021 Update ⁽¹¹⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for head trauma, providing guidelines for the use of neuroimaging in the management of head and brain injury.

Target Population: Patients with head trauma, including children and young adults.

Key Factors: The guidelines cover the acute, subacute, and chronic phases of head trauma. CT is recommended as the first-line imaging modality for suspected intracranial injury, while MRI is useful for persistent neurologic deficits. The document includes recommendations for imaging based on the severity of head trauma (mild, moderate, severe) and specific clinical scenarios, such as suspected intracranial arterial or venous injury and cerebrospinal fluid leak.

ANALYSIS OF EVIDENCE

Analysis ^(1,3,11):

The evidence from these articles collectively supports the use of CT imaging as a crucial tool in diagnosing and managing various sinonasal conditions. CT imaging is particularly valuable for its detailed depiction of bony anatomy, which is essential for surgical planning and accurate diagnosis. While MRI is preferred for its superior soft tissue contrast, CT remains the gold standard for evaluating bony structures and detecting complications related to sinonasal diseases.

The articles also highlight the limitations of radiographic imaging, emphasizing that CT imaging is more appropriate for initial evaluation, especially in cases with suspected complications. However, the recommendations for CT imaging vary depending on the specific condition being addressed, such as acute rhinosinusitis, chronic rhinosinusitis, or suspected sinonasal mass.

In summary, CT imaging is a vital diagnostic tool for sinonasal diseases, with its use tailored to the specific clinical scenario. The shared and differing conclusions from these articles provide a comprehensive understanding of the role of CT imaging in managing sinonasal conditions.

Shared Conclusions:

- **Importance of CT Imaging:** All three articles emphasize the importance of CT imaging in diagnosing and managing sinonasal diseases. CT is highlighted for its detailed depiction of bony anatomy, which is essential for surgical planning and accurate demonstration of sinonasal disease, bony erosions, and anatomic variants.

- **CT vs. MRI:** CT is preferred for its ability to accurately demonstrate the presence of sinonasal disease and bony erosions, while MRI is noted for its superior soft tissue contrast, which is useful for identifying intracranial and intraorbital complications.
- **Radiographic Imaging:** Radiographic imaging is generally considered inappropriate for initial imaging of uncomplicated rhinosinusitis due to its low sensitivity and specificity compared to CT.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This guideline replaces Evolent Clinical Guideline 009 for Sinus Maxillofacial CT, Limited or Localized Follow Up Sinus CT ● Removed Limited or Localized Follow Up Sinus CT in the title and CPT code 76380 as it will be moved to a new guideline for Follow Up, Limited, or Localized CT ● Clarified indications for structural abnormalities, facial trauma, anosmia, nasal fracture, Granulomatosis polyangiitis (GPA), nasal polyposis, and CSF leak ● Added odontogenic infection, allergic rhinitis, epistaxis, immunodeficiency indications ● Updated language in the preoperative/postoperative section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Applicable Line of Business adjusted – Medicare checked ● Updated and expanded references ● Updated background
June 2024	● Updated references ● Updated background ● Added contraindications and preferred studies to background ● Added to initial workup prior to Bone Marrow Transplant (BMT) ● Clarified anosmia indication ● Added legislative requirements for WA State

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2039 for Neck Computed Tomography (CT)

Guideline Number: Evolent_CG_2039	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

INDICATIONS

Suspected Neoplasm or Malignancy

- Suspicious lesion that is indeterminate or abnormal on prior imaging and requires further evaluation ^(1,2)
- Suspicious lesion(s) seen on physical exam and/or endoscopy in the mouth or throat (Such as a mass or ulceration in the oral cavity or pharynx) ⁽³⁾
- Known or suspected salivary gland neoplasm (parotid, submandibular, and/or sublingual gland) after prior indeterminate or abnormal imaging (such as ultrasound)

NOTE: Ultrasound is the initial imaging study of a salivary gland mass. Fine needle aspiration (FNA) is usually the next step in the evaluation of a possible salivary gland malignancy and advanced imaging is not typically needed prior to biopsy

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽⁴⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as nasopharynx, base of tongue, hypopharynx, pyriform sinus)

NOTE: CT/MRI of Sinus/Face, Orbit, or PET may also be indicated

Neck Mass or Lymphadenopathy

- Advanced Imaging of a neck mass/lymphadenopathy is indicated with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as ultrasound, non-neck CT/MRI) ^(1,2)
 - Neck mass/lymphadenopathy present in an anatomic area that is not evaluated adequately by ultrasound (such as oral cavity, oropharynx, behind (deep to) the mandible or behind (deep to) the airway/pharynx)
 - Increased risk for malignancy with any **ONE** (or more) of the following findings ⁽⁵⁾:
 - Fixation to adjacent tissues
 - Firm consistency
 - Size > 1.5 cm
 - Ulceration of overlying skin
 - Mass present for ≥ two weeks (or uncertain duration) without significant fluctuation and not considered to be from an infectious cause
 - History of prior cancer
 - Failed 2 weeks (or more) treatment for suspected infectious etiology

Vocal Fold (Cord) Lesions

- Vocal cord lesion(s) that is suspicious for malignancy (such as ulceration, hyperkeratosis (leukoplakia))
- Vocal cord immobility (can be an indicator of malignancy in the neck and/or chest) ⁽⁶⁾

NOTE: Chest CT is also indicated in the evaluation of the vocal cord immobility

Follow-up of Known Malignancy ⁽⁴⁾

For malignancies not listed, Neck CT is only indicated when there are signs or symptoms of neck involvement (such as palpable masses/lymph nodes or dysphagia)

Initial Staging

- Neck CT is indicated for initial diagnostic workup for the following cancer types:
 - Head and neck cancers
 - Thyroid cancer
 - B cell lymphomas (follicular lymphoma, diffuse large B cell lymphoma, Burkitt lymphoma, B-lymphoblastic lymphoma, post-transplant lymphoproliferative disorders)
 - ALL

- AML
- Hodgkin lymphoma (pediatric and adult)
- Pediatric aggressive mature B cell lymphomas (Burkitt lymphoma, Diffuse large B cell lymphoma, primary mediastinal large B cell lymphoma)
- Occult primary

Restaging

- Neck CT is indicated during active treatment (every 2-3 cycles of chemotherapy or immunotherapy, following radiation and/or after surgery) for the following malignancies:
 - Head and neck cancers (and after radiation treatment)
 - Thyroid cancer (and after surgery and/or if any concern for recurrence or progression)
 - ALL
 - AML
 - B Cell lymphomas (follicular lymphoma, diffuse large B cell lymphoma, Burkitt lymphoma, B-lymphoblastic lymphoma, post-transplant lymphoproliferative disorders)
 - Hodgkin lymphoma (pediatric and adult)
 - Pediatric aggressive mature B cell lymphomas (Burkitt lymphoma, Diffuse large B cell lymphoma, primary mediastinal large B cell lymphoma)
 - Occult primary

Surveillance

- Neck CT is appropriate during surveillance for the following malignancies at the intervals defined below:
 - ALL if lymphomatous features present, every 3-6 months for 2 years
 - AML if extramedullary disease present, every 3-6 months for 2 years
 - B Cell lymphomas (pediatric and adult) every 6 months for 2 years then annually as clinically indicated
 - Head and Neck cancer annually when specified that the area of original disease is difficult to follow on direct visualization (surveillance is typically with exam/scope rather than imaging)
 - Hodgkin lymphoma (pediatric and adult) every 3-6 months for 2 years
 - Occult primary every 3-6 months for 2 years, every 6-12 months for 3 years then annually

Note: There would need to be a sign or symptom of recurrence to consider Neck CT when the timeframe above for routine surveillance has elapsed OR when a cancer is not listed above

because neck CT is not routinely a part of surveillance for that cancer in an asymptomatic patient.

Thyroid Gland

- Initial staging and restaging of known thyroid cancer ⁽⁷⁾
- To assess extent of enlarged thyroid tissue (Goiter) (benign **OR** malignant) with any **ONE** of the following:
 - When prior imaging or physical exam suggests extension through the thoracic inlet into the mediastinum
 - When prior imaging or physical exam suggests compression/involvement of the airway or esophagus
 - Clinical concern for airway compression/obstruction (such as symptoms of dyspnea, stridor, hoarseness) ⁽⁸⁾
 - Clinical concern for esophageal compression/obstruction (such as symptoms of dysphagia, weight loss)

NOTE: Ultrasound is the initial imaging study of a thyroid region mass. Biopsy is usually the next step in the evaluation of a possible thyroid malignancy and advanced imaging is not typically needed prior to biopsy

Parathyroid Gland(s) ⁽⁹⁾

- Diagnosed hyperparathyroidism when prior imaging (Such as ultrasound, nuclear medicine scan) is indeterminate or abnormal and surgery is planned **OR** is being considered

Infection and Inflammation

- Known or suspected deep space infection and/or abscesses of the pharynx or neck with signs or symptoms of infection (such as erythema, swelling, fluctuance, fever, pain) ⁽¹⁰⁾

Throat Pain (Odynophagia) (11)

- Advanced imaging for unexplained throat pain (odynophagia) is indicated with **ALL** of the following:
 - Duration of ≥ 2 weeks
 - Unknown etiology with no clinical evidence of infection (such as fever, swelling)
 - Otolaryngologic exam with laryngoscopy (endoscopy) showing no clear etiology of the pain
 - Prior failed treatment for laryngopharyngeal reflux (LPR) (such as diet alterations, proton pump inhibitor therapy, H2 blocker therapy)
 - Prior failed treatment for post-nasal drip (PND) (such as nasal saline irrigation, anti-histamines, decongestants, antibiotics)

- Clinical concern or risk factors for malignancy (such as prior tobacco use, alcohol use, dysphagia, weight loss, age > 50 years)

Ear Pain (Otalgia) ⁽¹²⁾

- Advanced imaging for unexplained ear pain (otalgia) is indicated with **ALL** of the following:
 - Duration of ≥ 2 weeks
 - Unknown etiology with no clinical evidence of infection (such as fever, swelling, middle ear fluid)
 - Otolaryngologic exam with laryngoscopy (endoscopy) **AND** ear exam showing no clear etiology of the pain
 - Clinical concern or risk factors for malignancy (such as prior tobacco use, alcohol use, dysphagia, weight loss, age > 50 years)

Salivary Gland Infection/Inflammation (Sialadenitis) ^(13,14)

- After prior indeterminate or abnormal imaging
- Clinical concern for abscess formation (such as neck swelling, visualized purulence from salivary duct)
- Suspected or known salivary gland stones
- Bilateral salivary gland involvement
- Recurrent acute infection of the salivary gland(s)

Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) ⁽¹⁵⁾

- Advanced imaging for GPA is indicated with any **ONE** of the following:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

NOTE: Imaging of the Neck, Chest, and/or Abdomen may also be indicated for GPA as involvement of the airway, lungs, and/or kidneys is common

Neck Trauma

- History of recent neck trauma with any **ONE** of the following signs/symptoms:
 - Stridor or stertor
 - Dyspnea
 - Neck crepitus, subcutaneous air

- Hoarseness, dysphonia
- Dysphagia, odynophagia (pain with swallowing)
- Indeterminate or abnormal prior imaging

Airway

- CT imaging is indicated for the evaluation of possible airway pathology with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as X-ray, ultrasound, fluoroscopy)
 - Clinical evidence suggesting airway obstruction (such as stridor, stertor, dyspnea on exertion)
 - For evaluation of known or suspected laryngeal, subglottic, or tracheal stenosis ⁽¹⁶⁾

Esophagus / Pharynx

- CT imaging is indicated for the evaluation of dysphagia after appropriate prior work up including endoscopy (EGD) and/or fluoroscopic studies (Such as modified barium swallow, biphasic Esophogram) is indeterminate or abnormal ^(10,17)

NOTE: CT of the neck only evaluates the pharynx and the superior portion of the esophagus (Such as the upper esophageal sphincter) and CT of the chest is also needed to fully evaluate the esophagus

Foreign Body ⁽¹⁸⁾

- To evaluate for a possible foreign body when prior imaging is indeterminate or abnormal
- For procedure/surgical planning to manage a known foreign body

Cranial Nerve Abnormalities ⁽¹⁹⁾

Facial Nerve Paresis/Bell's Palsy/Hemifacial Spasm (CN VII) ^(20,21)

If MRI is contraindicated or cannot be performed

- Facial nerve paresis/ Bell's palsy / hemifacial spasm with atypical features requiring evaluation of the extracranial course of the facial nerve (such as incomplete/no improvement at three months, involvement of only specific branches of the facial nerve, second paralysis of the same side, or facial twitching/spasms prior to onset)

NOTE: MRI Brain with internal auditory canal (IAC) (or CT Head if MRI is contraindicated or not available) with imaging of the intracranial course of the facial nerve is the preferred initial study for facial nerve paresis/ Bell's palsy / hemifacial spasm

Cranial Nerves IX-XII ⁽¹⁹⁾

If MRI is contraindicated or cannot be performed

- Clinical evidence of cranial nerve (CN IX, X, XI, and/or XII) deficits or dysfunction (Such as dysphagia, shoulder/neck movement abnormalities, tongue movement abnormalities, vocal fold movement or sensation abnormalities)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is specified elsewhere in the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- PGL/PCC ⁽²²⁾:
 - Hereditary PGL/PCC Syndromes (including SDHx mutations): Every 2 years (including at diagnosis) **AND** MRI is contraindicated or cannot be performed

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Neck/Chest/Abdomen/Pelvis CT

- PGL/PCC ⁽²²⁾ :
 - Hereditary PGL/PCC Syndromes (including SDHx mutations): Every 2 years (including at diagnosis) AND MRI is contraindicated or cannot be performed

OTHER COMBINATION STUDIES WITH NECK CT

NOTE: When medical necessity is met for an individual study AND conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Neck/Chest CT

- Vocal cord immobility on endoscopic exam and concern for recurrent laryngeal nerve lesion
- Phrenic nerve paralysis on diaphragm fluoroscopy (fluoroscopic sniff test)
- Evaluation of dysphagia after appropriate prior work up including endoscopy (EDG) and/or fluoroscopic studies (such as modified barium swallow, biphasic Esophogram) is indeterminate abnormal ⁽¹⁷⁾
- Evaluation of possibly airway pathology with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as X-ray, ultrasound, fluoroscopy)
 - Clinical evidence suggesting airway obstruction (such as stridor, stertor, dyspnea on exertion)
 - For evaluation of known or suspected laryngeal, subglottic, or tracheal stenosis ⁽¹⁶⁾

Sinus/Maxillofacial/Neck/Chest/Abdomen CT

- Advanced imaging for Granulomatosis with Polyangitis (GPA) (Formally Wegener's Granulomatosis) ⁽¹⁵⁾

Face/Sinus/Orbit/Neck CT and PET

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽⁴⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when it is documented that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as orbit, nasopharynx, base of tongue, hypopharynx, pyriform sinus)

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

70490, 70491, 70492, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Neck Mass-Adenopathy⁽¹⁾

Study Design: This document is a guideline developed by the American College of Radiology (ACR) for the appropriate use of imaging in the evaluation of neck masses and adenopathy. It is based on a comprehensive review of current medical literature and expert opinion.

Target Population: The guidelines apply to both adult and pediatric patients presenting with a palpable neck mass or neck fullness.

Key Factors: The choice of imaging is based on patient age, mass location, and clinical pulsatility. For example, CT neck with IV contrast is usually appropriate for non-pulsatile neck masses, while MRI neck without and with IV contrast is recommended for pulsatile neck masses. The guidelines emphasize the importance of considering neoplastic, congenital, and inflammatory causes of neck masses. For adults over 40, especially with a smoking history, malignancy is highly suspected. The document discusses various imaging techniques such as CT, MRI, ultrasound, and PET/CT, and their appropriateness for different clinical scenarios. It is recommended to confirm suspected malignancy through tissue sampling.

Clinical Practice Guideline: Evaluation of the Neck Mass in Adults⁽⁵⁾

Study Design: This is a clinical practice guideline developed by the American Academy of Otolaryngology—Head and Neck Surgery Foundation for the evaluation of neck masses in adults. It is based on systematic reviews, randomized controlled trials, and expert consensus.

Target Population: The guideline targets adults aged 18 years and older with a neck mass.

Key Factors: The guideline aims to promote efficient, effective, and accurate diagnostic workup of neck masses to ensure prompt diagnosis and intervention for potentially malignant diseases. It identifies patients at increased risk for malignancy based on factors such as the absence of infectious etiology, mass duration of ≥ 2 weeks, fixation to adjacent tissues, firm consistency, size > 1.5 cm, and ulceration of overlying skin. The guideline recommends a thorough history and physical examination, imaging (CT or MRI with contrast), and fine-needle aspiration (FNA) for diagnosis.

ANALYSIS OF EVIDENCE

Analysis^(1,5):

Both articles underscore the significance of neck CT with contrast in diagnosing and evaluating neck masses, particularly for detecting malignancy. They agree on the complementary role of other imaging techniques like MRI and ultrasound. However, they differ in their specific recommendations and discussions of imaging techniques, with "Aulino 2019 ACR Neck Mass Adenopathy" providing detailed appropriateness criteria and "Pynnonen 2017" emphasizing the evaluation of cystic neck masses.

Shared Conclusions:

- **Importance of Neck CT with Contrast:** Both articles emphasize the importance of using neck CT with intravenous (IV) contrast for evaluating neck masses. This imaging

modality is considered essential for detecting abscesses, tumors, and inflammation, and for providing precise localization of the palpable findings.

- **Role in Diagnosing Malignancy:** Both articles agree that neck CT with contrast is crucial for diagnosing malignancy. It helps in identifying abnormal lymph nodes, guiding the search for primary tumors, and assessing the relationship of neck masses to major vessels.
- **Complementary Imaging Techniques:** Both articles mention that neck CT can be complemented by other imaging techniques such as MRI and ultrasound. MRI is noted for its improved soft-tissue contrast, while ultrasound is useful for image-guided sampling.

POLICY HISTORY

Date	Summary
July 2025	● Adjusted guideline name, spelled out acronym ● Added a Summary of Evidence and Analysis of Evidence ● Last reviewed date adjusted
June 2025	● This guideline replaces Evolent Clinical Guideline 008-1 for Neck CT ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Clarified indications for neck mass, ear pain, throat pain, and salivary gland diagnosis ● Added thyroid goiter, neck trauma, airway pathology, and granulomatosis angiitis indications ● Updated language in the preoperative/postoperative section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Sinus and Orbit added to the Face/Neck CT and PET combo and added in additional criteria ● Added Sinus/Maxillofacial/Neck/Chest/ Abdomen CT combo with GPA indication ● Added additional criteria to the Neck/Chest CT combo for dysphagia and evaluation of airway pathology ● Applicable Line of Business adjusted – Medicare checked

Date	Summary
	● Reduced background ● Updated references
June 2024	● Updated references ● Updated background ● Added follow-up of known cancer section (initial staging, restaging, surveillance) ● Added combo section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evotent Clinical Guideline 2009 for Brain Computed Tomography Angiography (CTA)

Guideline Number: Evotent_CG_2009	<u>Applicable Codes</u>	
<i>"Evotent" refers to Evotent Health LLC and Evotent Specialty Services, Inc.</i> <i>© 1997 - 2026 Evotent. All rights Reserved.</i>		
Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for performing computed tomography angiography (CTA) in the head/brain region.

Special Note

Brain CT/CTA are not approvable simultaneously unless they meet the criteria described below in the Indications for Brain CT/Brain CTA combination studies section. If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combination Studies** section for indicated combinations below)

NOTE: Authorization for CT Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR BRAIN CT ANGIOGRAPHY

Evaluation of Suspected Intracranial Vascular Disease ^(1,2)

Aneurysm Screening

- Screening for intracranial aneurysm if two or more first-degree family members (parent, brother, sister, or child) of intracranial aneurysm ^(1,3)
 - **Note:** Repeat study is recommended every 5-7 years ⁽³⁾

- For one first degree relative with aneurysm, asymptomatic screening is not indicated and would require a neurological sign or symptom supporting clinical concern for aneurysm ⁽⁴⁾
- Screening for aneurysm in high-risk populations ⁽¹⁾:
 - KNOWN genetic syndromes (see **Genetic Syndromes and Rare Diseases**)
 - Bicuspid aortic valve
 - Known aortic diseases (aneurysm, coarctation, dissection)

Suspected Vascular Abnormalities

- Suspected high flow vascular malformation (arteriovenous malformation (AVM) or dural arteriovenous fistula) in patient with previous or indeterminate imaging study ^(1,2)
 - **Note:** MRI is the study of choice for detecting low-flow vascular malformations such as cavernomas, developmental venous anomalies and capillary telangiectasia ⁽²⁾
- Thunderclap headache with continued concern for underlying vascular abnormality (i.e., aneurysm or reversible cerebral vasoconstriction syndrome) after initial negative brain imaging. ⁽⁵⁻⁸⁾
 - **Note:** Negative brain CT < 6 hours after headache onset excludes subarachnoid hemorrhage in neurologically intact patients. ⁽⁸⁾ MRI lacks sensitivity in excluding subarachnoid hemorrhage less than 24 hours after headache onset. ^(5,9)
- Headache associated with exercise, exertion, or sexual activity ^(5,10)
- Isolated third nerve palsy (oculomotor) with pupil involvement to evaluate for aneurysm ^(11,12)
- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis)
 - **NOTE:** CTA/MRA of the chest and neck may also be indicated
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ⁽¹³⁻¹⁵⁾

Cerebrovascular Disease

Ischemic

- Recent ischemic stroke or transient ischemic attack (See **background** section) ^(16,17)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech. ⁽¹⁸⁻²⁰⁾
- Suspected carotid or vertebral artery dissection (secondary to trauma or spontaneous) ^(17,21,22)
- Suspected cerebral vasospasm ⁽¹⁾

Hemorrhagic

- Known subarachnoid hemorrhage (SAH) ^(1,2)
- Known cerebral intraparenchymal hemorrhage with concern for underlying vascular abnormality ^(2,17)

Venous – when MRA is contraindicated or cannot be performed ^(7,17)

- Suspected central venous thrombosis and ANY ONE of the following:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs of increased intracranial pressure
- Distinguishing benign intracranial hypertension (pseudotumor cerebri) from dural sinus thrombosis

Vasculitis and Other Intracranial Vascular Disease

- Known vasculitis or autoimmune disease with concern for secondary CNS vasculitis based on neurological signs or symptoms
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ^(1,23)
- Large vessel vasculitis
 - Giant cell arteritis with suspected intracranial involvement ⁽²⁴⁾
 - Takayasu's Arteritis ⁽²⁵⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years
- Suspected Moyamoya disease ^(2,26)
- Suspected reversible cerebral vasoconstriction syndrome ^(7,27)
- For patients with fibromuscular dysplasia (FMD) ^(28,29):
 - One-time vascular study from brain to pelvis
- Spontaneous coronary arteries dissection (SCAD) ⁽⁶⁾:
 - One-time vascular study from the brain to pelvis

Evaluation of Known Intracranial Vascular Disease ^(1,2)

- Known intracranial aneurysm, treated aneurysm, or known vascular malformation (i.e., AVM or dural arteriovenous fistula)

- Known vertebrobasilar insufficiency with new or worsening signs or symptoms (VBI) ^(19,20)
- Follow-up of known carotid or vertebral artery dissection with any ONE of the following ^(17,30,31):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Known vasculitis, reversible cerebral vasoconstriction syndrome or Moyamoya disease ^(2,26,27,32)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation ⁽¹⁶⁾:

- Refractory trigeminal neuralgia or hemifacial spasm when done for surgical evaluation ⁽³³⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- ADPKD (Autosomal Dominant Polycystic Kidney Disease) when MRA is contraindicated or cannot be performed ⁽³⁴⁾:
 - Every 10 years (including at diagnosis)
- Loeys-Dietz ⁽³⁵⁾:
 - Every two years (including at diagnosis) OR
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽³⁶⁾:
 - Every 18 months (including at diagnosis) OR
 - As clinically indicated to follow known vascular abnormalities

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain CT and CTA

- Sickle Cell Disease ^(37,38):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s
 - New neurologic or cognitive concerns (including TIA, no formal testing required)
 - When cessation or changing frequency of transfusions is under consideration

Brain/Neck/Chest/Abdomen/Pelvis CTA

- Loeys-Dietz ⁽³⁵⁾:
 - Every two years (including at diagnosis) OR
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽³⁶⁾:
 - Every 18 months (including at diagnosis) OR
 - As clinically indicated to follow known vascular abnormalities

OTHER COMBINATION STUDIES WITH BRAIN CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay),

the entire combination is indicated)

Brain CT and Brain CTA

- Recent ischemic stroke
- Recent transient ischemic attack (TIA) when MRI is contraindicated or cannot be performed ^(16,17)
- Acute, sudden onset of headache with personal history of a vascular abnormality or first-degree family history of aneurysm ^(1,7)
- Thunderclap headache >6 hours after onset in an acute setting with high suspicion of SAH ⁽⁷⁾
- Headache associated with exercise, exertion, or sexual activity when MRI is contraindicated or cannot be performed ⁽⁵⁾
- Suspected central venous thrombosis and MRI is contraindicated or cannot be performed and ANY ONE of the following ⁽¹⁷⁾:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or Covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- Known Moyamoya disease ^(2,26) or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms ^(7,27)
- Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies when MRI is contraindicated or cannot be performed ⁽¹⁾
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up when MRI is contraindicated or cannot be performed ^(1,23,39)

Brain CT and Brain/Neck CTA ^(2,17)

- Recent ischemic stroke
- Recent transient ischemic attack (TIA) when MRI is contraindicated or cannot be performed ^(16,17)
- History of stroke and ONE of the following:
 - No prior workup when MRI is contraindicated or can't be performed
 - New neurologic signs or symptoms
- Suspected or known carotid or vertebral artery dissection with focal or lateralizing neurological deficits

Note: MRA and CTA are generally comparable noninvasive imaging alternatives each with their own advantages and disadvantages. Brain MRI can alternatively be combined with Brain CTA/Neck CTA.

Brain/Neck CTA

- Recent ischemic stroke or transient ischemic attack ^(16,17)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech ^(18–20,40)
- Suspected carotid ⁽⁴¹⁾ or vertebral ⁽⁴²⁾ artery dissection (secondary to trauma ⁽⁴³⁾ or spontaneous) ^(17,21,22)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(17,30,31):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽²⁴⁾
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 70\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(17,44)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(17,44)
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(14,15)

Brain/Neck/Chest/Abdomen/Pelvis CTA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(28,29)
- For assessment in patients with spontaneous coronary artery dissection (SCAD), SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD) ⁽⁴⁵⁾
 - **NOTE:** Body vascular imaging for SCAD can be done at time of coronary angiography
- Takayasu's Arteritis ⁽²⁵⁾:
 - At initial diagnosis

- Every 6 months for the first 2 years while on therapy
- Annually after the first 2 years

Brain/Neck/Chest CTA

- Non central Horner's syndrome (secondary/preganglionic or tertiary/post-ganglionic) for evaluation of underlying vascular source (such as dissection, aneurysm, arteritis) ^(46,47)

CODING AND STANDARDS

Codes

70496

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Pulsatile tinnitus

Pulsatile tinnitus has many etiologies, and the choice of study should be based on accompanying signs and symptoms. For general screening MRI brain with IAC/MRA brain and neck is approvable. If IIH is suspected (typically with headache and vision changes in a younger woman with a high BMI), MRI/MRV brain is indicated. If there is concern for vascular etiology, CTA or MRA brain/neck is indicated. If there is associated hearing loss and neurological signs/symptoms, MRI brain with IAC is indicated. If the temporal bone is suspected to be involved and/or retrotympenic lesion seen on otoscopy, CT temporal bone/IAC is indicated. If there is concurrent concern for bony and a vascular issue, CTA of the head and neck can be used to evaluate both.

*CTV and Central Venous Thrombosis***

CT Venogram is indicated for the evaluation of a central venous thrombosis/dural sinus thrombosis. The most frequent presentations are isolated headache, intracranial hypertension

syndrome, seizures, focal neurological deficits, and encephalopathy. Risk factors are hypercoagulable states inducing genetic prothrombotic conditions, antiphospholipid syndrome and other acquired prothrombotic diseases, such as cancer, oral contraceptives, pregnancy, puerperium (6 weeks postpartum), infections, and trauma. Since venous thrombosis can cause SAH, infarctions, and hemorrhage, parenchymal imaging with MRI/CT is also appropriate. ^(48–51)

CTA and Dissection

Craniocervical dissections can be spontaneous or traumatic. Spontaneous dissection presents with headache, neck pain with neurological signs or symptoms. There is often minor trauma or precipitating factor (i.e., exercise, neck manipulation).. Dissection of the extracranial vessels can extend intracranially and/or lead to thrombus which can migrate into the intracranial circulation causing ischemia. Therefore, vascular imaging of the head and neck is warranted. ^(22,52)

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Cerebrovascular Diseases-Aneurysm, Vascular Malformation, and Subarachnoid Hemorrhage ⁽¹⁾

Study Design: The study design involves a detailed literature review and expert panel recommendations to establish imaging guidelines for various cerebrovascular conditions. The criteria are based on the latest evidence and expert consensus to ensure appropriate imaging procedures are selected for different clinical scenarios.

Target Population: The target population includes patients with cerebrovascular diseases such as aneurysms, vascular malformations, and SAH. Specific variants address different clinical presentations, including known acute SAH, suspected cerebral vasospasm, untreated cerebral aneurysms, previously treated cerebral aneurysms, high-risk cerebral aneurysm screening, known high-flow vascular malformations, and suspected CNS vasculitis.

Key Factors:

Imaging Recommendations: The document outlines the appropriateness of various imaging modalities, including arteriography, CTA, MRA, MRI, and ultrasound, for different clinical scenarios. Each variant provides specific recommendations based on the clinical presentation and the relative radiation level associated with each imaging procedure.

Clinical Presentations: The criteria cover a wide range of clinical presentations, from acute SAH to surveillance monitoring of untreated and treated aneurysms, as well as screening for high-risk populations and evaluation of suspected CNS vasculitis.

Expert Panel: The recommendations are developed by an expert panel on neurological imaging, including specialists from various institutions and organizations. The panel's collaboration ensures a comprehensive and well-rounded approach to imaging guidelines.

Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition ⁽⁵⁾

Study Design: The ICHD-3 is a systematic classification of headache disorders based on extensive research and clinical studies. The classification is hierarchical, allowing for detailed diagnosis from the first-digit level to the fifth. The criteria for each headache type are based on clinical features, diagnostic criteria, and evidence from field-testing studies.

Target Population: The target population includes individuals experiencing various types of headaches, ranging from primary headaches like migraines and tension-type headaches to secondary headaches attributed to other disorders. The classification is intended for use by healthcare professionals, including neurologists, general practitioners, and researchers, to diagnose and manage headache disorders.

Key Factors:

Primary Headaches: The document classifies primary headaches into categories such as migraines, tension-type headaches, and trigeminal autonomic cephalalgias. Each category includes specific diagnostic criteria, clinical features, and comments on pathophysiology and treatment.

Secondary Headaches: These are headaches attributed to other disorders, such as trauma, vascular disorders, infections, and psychiatric disorders. The classification provides criteria for diagnosing secondary headaches based on the temporal relationship between the headache and the underlying disorder.

Diagnostic Criteria: The criteria for each headache type include the number of attacks, duration, pain characteristics, associated symptoms, and exclusion of other diagnoses. For example, migraine without aura requires at least five attacks lasting 4-72 hours with specific pain characteristics and associated symptoms like nausea and photophobia.

Field Testing: The classification includes results from field-testing studies that validate the diagnostic criteria. These studies involve large populations and use advanced diagnostic methods like neuroimaging and genetic testing.

Clinical and Research Applications: The ICHD-3 is designed for both clinical practice and research. It helps clinicians diagnose and manage headache disorders and provides a standardized framework for researchers to study headache epidemiology, pathophysiology, and treatment.

ACR Appropriateness Criteria® Cerebrovascular Diseases-Stroke and Stroke-Related Conditions ⁽¹⁷⁾

Study Design: The document is a guideline developed by the American College of Radiology (ACR) Appropriateness Criteria Expert Panel on Neurological Imaging. It is based on a systematic analysis of medical literature from peer-reviewed journals and follows established methodology principles such as the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) and the RAND/UCLA Appropriateness Method.

Target Population: The guidelines are intended for use by radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment for patients with cerebrovascular diseases, including stroke and stroke-related conditions.

Key Factors:

Conditions Covered: The guidelines encompass a wide range of cerebrovascular diseases, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, and cerebral venous sinus thrombosis. They also address complications such as intraparenchymal hemorrhage and completed ischemic strokes.

Imaging Recommendations: The document provides evidence-based guidelines for appropriate imaging examinations for diagnosis and treatment of specified medical conditions. It includes recommendations for various imaging modalities such as CT, MRI, MRA, and ultrasound.

Clinical Scenarios: The guidelines cover different clinical scenarios, including transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage, among others.

Methodology: The guideline development and revision process involves a multidisciplinary expert panel and supports the systematic analysis of medical literature. In instances where peer-reviewed literature is lacking or equivocal, expert opinions are used to formulate recommendations.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,5,17):

1. **Diagnostic Imaging:** All three articles emphasize the importance of diagnostic imaging in identifying and managing cerebrovascular conditions. They discuss various imaging modalities such as CT, MRI, MRA, and CTA, highlighting their roles in diagnosing conditions like stroke, aneurysms, and vascular malformations.
2. **Clinical Guidelines:** The articles provide clinical guidelines for the management of cerebrovascular diseases. They stress the need for evidence-based approaches and the use of standardized criteria to ensure accurate diagnosis and effective treatment.
3. **Risk Factors:** Each article discusses the risk factors associated with cerebrovascular diseases, including hypertension, smoking, and genetic predispositions. They highlight the importance of identifying these risk factors to prevent and manage conditions effectively.

POLICY HISTORY

Date	Summary
July 2025	● Fixed a sentence-spacing error in the Background ● Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	● Guideline name changed from Brain CTA to Brain Computed Tomography Angiography (CTA) ● Guideline number changed from 004-1 to 2009 ● Added new bullet-point to the General Statement section ● Added a Summary of Evidence and Analysis of Evidence ● Updated references ● Updated background section ● Updated combination section ● Updated and rearranged the genetic section ● Removed headache with valsalva ● Clarified low and high flow vascular malformation ● Clarified central Horner's ● Clarified CVT ● Clarified secondary CNS vasculitis ● Clarified follow-up of known carotid or vertebral artery dissection ● Added intervals for imaging of Takayasu arteritis
June 2024	● Updated references ● Updated background section ● Updated combination section ● Clarified ○ Frequency of screening in genetic syndromes ● Added ○ Screening for aneurysm in high-risk populations ○ Bicuspid aortic valve ○ Known aortic diseases (aneurysm, coarctation, dissection)

Date	Summary
	○ Suspected cerebral vasospasm ○ Suspected carotid or vertebral artery dissection; secondary to trauma or spontaneous due to weakness of vessel wall (already in combo) ○ Follow-up of known carotid or vertebral artery dissection within 3-6 months for evaluation of recanalization and/or to guide anticoagulation treatment (already in combo) ○ Horner's syndrome, non-central (miosis, ptosis, and anhidrosis) - also in combo section ○ Genetic syndromes and rare disease section. ○ Refractory trigeminal neuralgia or hemifacial spasm when done for surgical evaluation ○ Note: For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management ○ To combo CT/CTA section Thunderclap headache >6 hours after onset in an acute setting with high suspicion of SAH ○ Large vessel vasculitis (Giant cell or Takayasu arteritis) with suspected intracranial and extracranial involvement (Brain/Neck CTA combo) ○ Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms (Brain CTA/Brain CT combo) ○ Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies (Brain CTA /CT combo) when MRI is contraindicated or cannot be performed ○ Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ((Brain CTA /CT combo) when MRI is contraindicated or cannot be performed ● Deleted ○ Pulsatile tinnitus combo section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2040 for Neck Computed Tomography Angiography (CTA)

Guideline Number: Evolent_CG_2040	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for performing Computed Tomography Angiography (CTA) in the neck/cervical region.

Special Note

If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combinations Studies** section for indicated combinations below)

NOTE: Authorization for CT Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR NECK CT ANGIOGRAPHY

Cerebrovascular Disease

- Recent ischemic stroke or transient ischemic attack ^(1–3)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such

as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech ^(4,5)

- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 70\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ^(1,2)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ^(1,2)

Tumor/Pulsatile Mass

- Pulsatile mass on exam ⁽⁶⁾
- Known or suspected carotid body tumors, or other masses such as a paraganglioma, arteriovenous fistula pseudoaneurysm, atypical lymphovascular malformation ^(4,6–8)

Note: Ultrasound (US) may be used to identify a mass overlying or next to an artery in initial work up of a pulsatile mass.

Vasculitis and Other Extracranial Vascular Disease

- Large vessel vasculitis ⁽⁹⁾
 - Giant cell with suspected extracranial involvement ⁽¹⁰⁾
 - Takayasu's Arteritis ⁽¹¹⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years
- For patients with Fibromuscular dysplasia (FMD) ^(12,13):
 - One-time vascular study from brain to pelvis
- Spontaneous coronary arteries dissection (SCAD) ⁽¹⁴⁾
 - One-time vascular study from brain to pelvis
- Subclavian steal syndrome when ultrasound is positive or indeterminate **OR** for planning interventions ^(15,16)
- Suspected carotid or vertebral artery dissection (secondary to trauma or spontaneous) ^(1,4,17,18)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(19,20):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment

- When there is recurrent pain, headache or new neurologic deficits that suggest progression
- To identify an arterial source of bleeding in patients with hemorrhage of the head and neck ^(4,21)
- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) with any **ONE** of the following ^(22,23):
 - For evaluation of a possible underlying vascular issue
 - Associated ipsilateral orbital, face, and/or neck pain that could indicate a possible contributing carotid artery dissection

NOTE: Vascular imaging of the brain and chest may also be indicated

- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(4,24)
- For further evaluation of a congenital vascular malformation of the head and neck ⁽⁴⁾
- Known extracranial vascular disease that needs follow-up or further evaluation ⁽⁴⁾

PREOPERATIVE POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINANT FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- Loeys-Dietz ⁽²⁵⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁶⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis CTA

- Loeys-Dietz ⁽²⁵⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁶⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

OTHER COMBINATION STUDIES WITH NECK CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain CT and Brain/Neck CTA ^(1,3)

- Recent ischemic stroke
- Recent transient ischemic attack (TIA) when MRI is contraindicated or cannot be performed ^(1,27)
- History of stroke and **ONE** of the following:
 - No prior workup when MRI is contraindicated or cannot be performed
 - New neurologic signs or symptoms
- Suspected or known carotid or vertebral artery dissection with focal or lateralizing neurological deficits

Note: MRA and CTA are generally comparable noninvasive imaging alternatives each with their own advantages and disadvantages. Brain MRI can alternatively be combined with Brain CTA/Neck CTA.

Brain/Neck CTA

- Recent ischemic stroke or transient ischemic attack ^(1,27)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech ^(5,28,29)
- Suspected carotid ⁽³⁰⁾ or vertebral ⁽³¹⁾ artery dissection (secondary to trauma ⁽³²⁾ or spontaneous) ^(1,17,18)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(1,19,20):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽¹⁰⁾
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis $\geq 70\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(1,2)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(1,2)
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(4,24)

Brain/Neck/Chest CTA

- Non central Horner's syndrome (secondary/preganglionic or tertiary/post-ganglionic) for evaluation of underlying vascular source (such as dissection, aneurysm, arteritis) ^(22,23)

Brain/Neck/Chest/Abdomen/Pelvis CTA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(12,13)
- For assessment in patients with spontaneous coronary artery dissection (SCAD), (SCAD

is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD) ⁽³³⁾

- **NOTE:** Body vascular imaging for SCAD can be done at time of coronary angiography
- Takayasu's Arteritis ⁽¹¹⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

CODING AND STANDARDS

Codes

70498

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

CTA and Dissection

Craniocervical dissections can be spontaneous or traumatic. Spontaneous dissection presents with headache, neck pain with neurological signs or symptoms. There is often minor trauma or precipitating factor (e.g., exercise, neck manipulation). Dissection of the extracranial vessels can extend intracranially and/or lead to thrombus, which can migrate into the intracranial circulation causing ischemia. Therefore, MRA of the head and neck is warranted. ^(18,34)

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

Society for Vascular Surgery clinical practice guidelines for management of extracranial cerebrovascular disease ⁽²⁾

Study Design: This document presents clinical practice guidelines for the management of extracranial cerebrovascular disease, specifically carotid bifurcation stenosis in stroke prevention. The guidelines are based on extensive investigations, including multiple randomized controlled trials (RCTs) and systematic reviews.

Target Population: The guidelines focus on patients with carotid bifurcation disease, including both symptomatic and asymptomatic patients with varying degrees of carotid artery stenosis.

Key Factors:

- **Carotid Endarterectomy (CEA) vs. Medical Therapy:** CEA is recommended over maximal medical therapy for low-risk patients with asymptomatic carotid bifurcation atherosclerosis and stenosis of >70%.
- **CEA vs. Transfemoral Carotid Artery Stenting (TF-CAS):** CEA is recommended over TF-CAS for low surgical risk patients with symptomatic carotid artery stenosis of >50%.
- **Timing of Carotid Intervention:** Carotid revascularization is recommended for symptomatic patients with >50% stenosis to be performed as soon as the patient is neurologically stable after 48 hours but definitely before 14 days after symptom onset.
- **Screening for Carotid Artery Stenosis:** Routine screening for asymptomatic carotid artery stenosis in individuals without cerebrovascular symptoms or significant risk factors is not recommended.
- **Optimal Sequence for Intervention:** For patients with symptomatic carotid stenosis of 50% to 99% who require both CEA and coronary artery bypass grafting (CABG), CEA before or concomitant with CABG is suggested.

ACR–ASNR–SPR Practice Parameter for the Performance and Interpretation of Cervicocerebral Computed Tomography Angiography (CTA) ⁽⁴⁾

Study Design: This document outlines the practice parameters for the performance and interpretation of cervicocerebral computed tomography angiography (CTA). It is a consensus-based guideline developed collaboratively by the American College of Radiology (ACR), the American Society of Neuroradiology (ASNR), and the Society for Pediatric Radiology (SPR).

Target Population: The guidelines are intended for practitioners performing and interpreting CTA for patients with various vascular diseases and conditions affecting the head and neck.

Key Factors:

- **Indications:** CTA is indicated for diagnosing and characterizing arterial aneurysms, ischemic stroke, atherosclerotic steno-occlusive disease, traumatic vascular injuries, venous and dural sinus thrombosis, vascular malformations, and other vascular conditions.
- **Qualifications:** The guidelines specify the qualifications and responsibilities of personnel involved in performing and interpreting CTA, including physicians, technologists, and medical physicists.
- **Specifications:** Detailed specifications for the examination technique, including patient preparation, CT equipment, and contrast administration, are provided to ensure optimal image quality and patient safety.
- **Radiation Safety:** Emphasis is placed on radiation safety principles to minimize exposure while achieving diagnostic quality.

ACR Appropriateness Criteria Cerebrovascular Diseases-Stroke and Stroke-Related Condition ⁽¹⁾

Study Design: This document provides the ACR Appropriateness Criteria for cerebrovascular diseases, stroke, and stroke-related conditions. The guidelines are evidence-based and reviewed annually by a multidisciplinary expert panel.

Target Population: The criteria focus on patients with stroke-related conditions, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, cerebral venous sinus thrombosis, intraparenchymal hemorrhage, and completed ischemic strokes.

Key Factors:

- **Imaging Recommendations:** The document outlines imaging recommendations for various clinical scenarios, including initial imaging for transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and surveillance imaging for prior ischemic infarct.
- **Variants:** The criteria include specific variants for different clinical presentations, such as TIA, acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage.
- **Relative Radiation Levels:** The document provides relative radiation levels for different imaging procedures to help guide the selection of appropriate imaging techniques.
- **Summary of Literature Review:** The guidelines are based on a systematic analysis of the medical literature from peer-reviewed journals and expert opinions

ANALYSIS OF EVIDENCE

Shared Findings ^(1,2,4):

- **Use of CTA for Stroke and Vascular Conditions:** All three articles agree on the importance of CTA in diagnosing and managing various cerebrovascular conditions, including stroke, carotid stenosis, and vascular malformations.

- **Preference for Non-Invasive Imaging:** Both AbuRahma et al 2022 and Pannell et al 2024 highlight the preference for non-invasive imaging modalities, such as duplex ultrasound, for initial screening of carotid artery stenosis in asymptomatic patients.
- **Importance of Timing:** The timing of carotid intervention is emphasized in both AbuRahma et al 2022 and Pannell et al 2024, with a focus on performing revascularization as soon as the patient is stable.

Conclusion ^(1,2,4)

In summary, while all three articles recognize the value of CTA in managing cerebrovascular conditions, they differ in their specific recommendations and focus areas. AbuRahma et al 2022 emphasizes the preference for CEA over TF-CAS and the use of duplex ultrasound for screening, Pannell et al 2024 provides a comprehensive overview of imaging recommendations for various cerebrovascular conditions, and ACR–ASNR–SPR CTA focuses on the technical aspects and safety considerations of performing CTA.

POLICY HISTORY

Date	Summary
July 2025	● Fixed a spelling typo in the Vasculitis and Other Extracranial Vascular Disease ○ Changed “identity” to “identify” ● Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	● Guideline name changed from Neck CTA to Neck Computed Tomography Angiography (CTA) ● Guideline number changed from 012-1 to 2040 ● Added new bullet-point to the General Statement section ● Updated references ● Updated background section ● Updated and rearranged the genetic section ● Added Vasculitis and Other Extracranial Vascular Diseases Section ● Added intervals for imaging of Takayasu arteritis ● Clarified central Horner’s Syndrome to evaluate for a vascular source ● Clarified follow-up of known carotid or vertebral artery dissection

Date	Summary
	● Added a Summary of Evidence and Analysis of Evidence
June 2024	● Updated references ● Updated background section ● Updated combination section ● Clarified ○ Frequency of screening in genetic syndromes ● Added ○ Follow-up of known carotid or vertebral artery dissection within 3-6 months for evaluation of recanalization and/or to guide anticoagulation treatment (already in combo) ○ Horner's syndrome, non-central (miosis, ptosis, and anhidrosis) - also in combo section ○ Giant cell arteritis with suspected intracranial and extracranial involvement - also in combo section ○ Genetic syndromes and rare disease section ● Deleted ○ Aneurysm screening section ○ Pulsatile tinnitus combo section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2048 for Sinus, Face, Orbit, Neck, and Internal Auditory Canal Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2048	<u>Applicable Codes</u>	
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Original Date: November 2007	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

- If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should be:
 - Inconclusive or show a need for additional or follow up imaging evaluation
 - The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.(*Unless approvable in the combination section as noted in the guidelines)
- See legislative language for specific mandates in the State of **Washington**

INDICATIONS FOR ORBIT MRI

Orbit MRI ^(1,2)

- Abnormal external or direct eye exam
 - Exophthalmos (proptosis) or enophthalmos (sunken eye)
 - Ophthalmoplegia with concern for orbital pathology
 - Unilateral optic disk swelling ⁽³⁻⁵⁾
 - Documented visual field defect with any **ONE** of the following ^(6,7):
 - Unilateral visual defects
 - Abnormal optic disc(s) (optic disc blurring, edema, or pallor) **AND**

- Not explained by underlying diagnosis, glaucoma, or macular degeneration
- Suspected optic neuritis with any **ONE** of the following ⁽⁸⁾:
 - Atypical presentation (such as bilateral, absence of pain, optic nerve hemorrhages, severe visual impairment, lack of response to steroids, poor recovery or recurrence) ⁽⁹⁾
 - If needed to confirm optic neuritis and rule out compressive lesions
- Orbital trauma ⁽¹⁰⁾
 - Physical findings of direct eye injury
 - Suspected orbital trauma with indeterminate or abnormal prior imaging
 - For further evaluation of an injury seen on prior imaging to assist in management decision-making
- Suspected or known ocular mass/neoplasm ⁽¹¹⁾
- Clinical suspicion of orbital infection
- Clinical suspicion of osteomyelitis ⁽¹²⁾
 - Direct visualization of bony deformity
 - Indeterminate or abnormal prior imaging
- Suspected Orbital Inflammatory Disease (also known as Orbital Inflammatory Pseudotumor)
- Congenital orbital anomalies (such as coloboma, microphthalmia, anophthalmia, dermoid cysts, hypertelorism) ⁽¹³⁾
- Complex strabismus with ophthalmoplegia (ophthalmoparesis) to aid in diagnosis and/or management ⁽¹⁴⁾
- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy

NOTE: CT/MRI of Sinus/Face, Neck, and/or PET may also be indicated

Combination Studies with Orbit MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Orbit/Brain MRI

- Optic neuropathy or unilateral optic disk swelling of unclear etiology to distinguish between a compressive lesion of the optic nerve, optic neuritis, ischemic optic neuropathy (arteritic or non-arteritic), central retinal vein occlusion or optic nerve infiltrative disorders ^(2,6)
- Bilateral optic disk swelling (papilledema) with vision loss ⁽²⁾
- Optic neuritis
 - If atypical presentation (bilateral, absence of pain, optic nerve hemorrhages, severe visual impairment, lack of response to steroids, poor recovery or recurrence) ^(2,9)
 - If needed to confirm optic neuritis and rule out compressive lesions
- Known or suspected neuromyelitis optica spectrum disorder with severe, recurrent, or bilateral optic neuritis ⁽²⁾
- Suspected retinoblastoma ⁽²⁾
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent intracranial pathology ⁽¹⁶⁾

Face/Sinus/Orbit/Neck MRI and PET

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as orbit, nasopharynx, base of tongue, hypopharynx, pyriform sinus)

INDICATIONS FOR FACE/SINUS MRI

Infection and Inflammation ⁽¹⁷⁾

- Suspected facial infection including any **ONE** of the following:
 - Osteomyelitis after indeterminate or abnormal prior imaging ⁽¹²⁾
 - Abscess based on clinical signs and symptoms of infection (such as erythema, swelling, fluctuance, fever, pain)

Rhinosinusitis ⁽¹⁸⁾

- Clinical suspicion of any type of fungal infection of the nasal cavity and/or paranasal sinuses or face including ⁽¹⁷⁾:
 - Invasive fungal infection
 - Allergic fungal sinusitis
 - Mycetoma (“fungus ball”)
- Clinical suspicion of possible orbital or intracranial complications of rhinosinusitis including any **ONE** of the following:
 - Preseptal or orbital (post-septal) infection
 - Epidural infection
 - Central nervous system infection
 - Osteomyelitis ⁽¹²⁾
 - Cavernous sinus thrombosis

NOTE: Prior medical therapy is **NOT** required if there is a suspected complication of rhinosinusitis

Nasal Polyposis ⁽¹⁸⁾

- Nasal polyps (unilateral or bilateral) noted on physical exam and/or endoscopy
- History of prior treatment of nasal polyps (medical or surgical) and suspicion for recurrence of nasal polyps based on symptoms (such as nasal obstruction, loss of sense of smell/taste)

Salivary Gland Infection/Inflammation (Sialadenitis) ^(19,20)

- After prior indeterminate or abnormal imaging
- Clinical concern for abscess formation (such as neck swelling, visualized purulence from salivary duct)
- Suspected or known salivary gland stones
- Bilateral salivary gland involvement
- Recurrent acute infection of the salivary gland(s)

Granulomatosis with Polyangiitis (GPA) (Formally Wegener’s Granulomatosis) ⁽²¹⁾

- Advanced imaging for GPA is indicated with any ONE of the following:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing)

including antineutrophil cytoplasmic antibodies (ANCA))

- Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

NOTE: Imaging of the Neck, Chest, and/or Abdomen may also be indicated for GPA as involvement of the airway, lungs, and/or kidneys is common

Sinonasal/Facial Mass or Neoplasm ⁽¹⁷⁾

- Known or suspected sinonasal/facial mass/neoplasm based on any **ONE** (or more) of the following:
 - Physical exam
 - Nasal endoscopy
 - Prior imaging
 - Suspicion of recurrence following surgical excision
- Known or suspected salivary gland neoplasm (parotid, submandibular, and/or sublingual gland) after prior indeterminate or abnormal imaging

NOTE: Ultrasound is the initial imaging study of a salivary gland mass. Biopsy is usually the next step in the evaluation of a possible salivary gland malignancy and advanced imaging is not typically needed prior to biopsy

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy (Such as nasopharynx, base of tongue, hypopharynx, pyriform sinus)

NOTE: CT/MRI of Orbit, Neck, and/or PET may also be indicated

Facial Trauma ⁽²²⁾

- Suspected facial injury with prior indeterminate or abnormal imaging
- Further evaluation of a known facial injury for treatment planning

Cerebral Spinal Fluid (CSF) Rhinorrhea ⁽²³⁾

- MRI Sinus/Face imaging for possible CSF rhinorrhea is indicated with any **ONE** of the following:

- High index of suspicion of CSF leak based on clinical evidence (such as consistent nasal leaking, worse leaking with provocative maneuvers (Valsalva), positive Beta-2 transferrin assay of the leakage)
- Prior imaging (such as CT, nuclear medicine imaging) is indeterminate or abnormal for a suspected CSF leak and further evaluation is needed.

Cranial Nerve Abnormalities

Anosmia, Hyposmia, or Dysosmia (CN I) ^(17,24,25)

- Advanced imaging for anosmia (complete loss of smell), hyposmia (reduced sense of smell) or dysosmia (abnormal sense of smell) is indicated with **ALL** of the following:
 - Persistent symptoms (generally considered to be 4 weeks or more)
 - Unknown origin (if related to rhinosinusitis, the indication for advanced imaging should meet the specific rhinosinusitis criteria)
 - Nasal endoscopy completed with indeterminate or abnormal findings **OR** nasal endoscopy documented as unavailable

NOTE: Advanced imaging for suspected olfactory disorders requires imaging the entire olfactory system. This can be accomplished with either an MRI of the Face or an MRI of the Brain depending on the institutional-specific MRI protocol.

Trigeminal Neuralgia/Neuropathy (CN V) ⁽²⁶⁾

- Suspected trigeminal neuralgia/neuropathy with atypical features requiring evaluation of the extracranial course of the trigeminal nerve (such as bilateral involvement, hearing loss, dizziness/vertigo, visual changes, sensory loss, pain > 2 min, pain outside trigeminal nerve distribution, progression)

NOTE: MRI of the brain (or CT of the head if MRI is contraindicated or not available) with complete imaging of the entire course of the trigeminal nerve is the preferred initial study for trigeminal neuralgia/neuropathy

Facial Nerve Paresis/Bell's Palsy/Hemifacial Spasm (CN VII) ^(27,28)

- Facial nerve paresis/ Bell's palsy / hemifacial with atypical features requiring evaluation of the extracranial course of the facial nerve (Such as incomplete/no improvement at three months, involvement of only specific branches of the facial nerve, second paralysis of the same side, or facial twitching/spasms prior to onset)

NOTE: MRI Brain with internal auditory canal (IAC) (or CT Head if MRI is contraindicated or not available) with imaging of the intracranial course of the facial nerve is the preferred initial study for facial nerve paresis/ Bell's palsy / hemifacial spasm

Combinations Studies with Face/Sinus MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Face/Sinus/Brain MRI

- Trigeminal neuralgia or neuropathy for evaluation of the intracranial nerve course with an atypical presentation (such as bilateral involvement, hearing loss, dizziness/vertigo, visual changes, sensory loss, pain > 2 min, pain outside trigeminal nerve distribution, progression ⁽²⁵⁾)
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent intracranial pathology ⁽¹⁶⁾

Face/Sinus/Orbit/Neck MRI and PET

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy

Sinus/Face/Neck/Chest/Abdomen MRI

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (formally Wegener's Granulomatosis) is indicated with any **ONE** of the following ⁽²¹⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

INDICATIONS FOR NECK MRI

Suspected Neoplasm or Malignancy ^(29,30)

- Suspicious lesion that is indeterminate or abnormal on prior imaging and requires further evaluation
- Suspicious lesion(s) seen on physical exam and/or endoscopy in the mouth or throat

(such as a mass or ulceration in the oral cavity or pharynx)

- Known or suspected salivary gland neoplasm (parotid, submandibular, and/or sublingual gland) after prior indeterminate or abnormal imaging

NOTE: Ultrasound is the initial imaging study of a salivary gland mass. Biopsy is usually the next step in the evaluation of a possible salivary gland malignancy and advanced imaging is not typically needed prior to biopsy

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as nasopharynx, base of tongue, hypopharynx, pyriform sinus)

NOTE: CT/MRI of Sinus/Face, Orbit, or PET may also be indicated

Neck Mass or Lymphadenopathy

- Advanced Imaging of a neck mass/lymphadenopathy is indicated with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as ultrasound, non-neck CT/MRI) ^(29,31)
 - Neck mass/lymphadenopathy present in an anatomic area that is not evaluated adequately by ultrasound (such as oral cavity, oropharynx, behind (deep to) the mandible or behind (deep to) the airway/pharynx)
 - Increased risk for malignancy with **ONE** (or more) of the following findings ⁽³⁰⁾:
 - Fixation to adjacent tissues
 - Firm consistency
 - Size > 1.5 cm
 - Ulceration of overlying skin
 - Mass present ≥ two weeks (or uncertain duration) without significant fluctuation and not considered to be from an infectious cause
 - History of prior cancer
 - Failed ≥ 2 weeks treatment for suspected infectious etiology ⁽¹⁷⁾

Vocal Fold (Cord) Lesions ⁽³²⁾

- Vocal cord lesion(s) that is suspicious for malignancy (such as ulceration, hyperkeratosis (leukoplakia))
- Vocal cord immobility (can be an indicator of malignancy in the neck and/or chest)

NOTE: Chest CT is also indicated in the evaluation of the vocal cord immobility

Throat Pain (Odynophagia) ⁽³³⁾

- Advanced imaging for unexplained throat pain (odynophagia) is indicated with **ALL** of the following:
 - Duration of ≥ 2 weeks
 - Unknown etiology with no clinical evidence of infection (such as fever, swelling)
 - Otolaryngologic exam with laryngoscopy (endoscopy) showing no clear etiology of the pain
 - Prior failed treatment for laryngopharyngeal reflux (LPR) (such as diet alterations, proton pump inhibitor therapy, H2 blocker therapy)
 - Prior failed treatment for post-nasal drip (PND) (such as nasal saline irrigation, antihistamines, decongestants, antibiotics)
 - Clinical concern and risk factors for malignancy (such as prior tobacco use, alcohol use, dysphagia, weight loss, age > 50 years)

Ear Pain (Ootalgia) ⁽³⁴⁾

- Advanced imaging for unexplained ear pain (otalgia) is indicated with **ALL** of the following:
 - Duration of ≥ 2 weeks
 - Unknown etiology with no clinical evidence of infection (such as fever, swelling, middle ear fluid)
 - Otolaryngologic exam with laryngoscopy (endoscopy) **AND** ear exam showing no clear etiology of the pain
 - Clinical concern and risk factors for malignancy (such as prior tobacco use, alcohol use, dysphagia, dysphonia, weight loss, age > 50 years)

Thyroid Gland

- Initial staging and restaging of known thyroid cancer ⁽³⁵⁾
- To assess extent of enlarged thyroid tissue (Goiter) (benign **OR** malignant) with any **ONE** of the following:
 - When prior imaging or physical exam suggests extension through the thoracic inlet into the mediastinum

- When prior imaging or physical exam suggests compression/involvement of the airway or esophagus
- Clinical concern for airway compression/obstruction (such as symptoms of dyspnea, stridor, hoarseness) ⁽³⁶⁾
- Clinical concern for esophageal compression/obstruction (such as symptoms of dysphagia, weight loss)

NOTE: Ultrasound is the initial imaging study of a thyroid region mass. Biopsy is usually the next step in the evaluation of a possible thyroid malignancy and advanced imaging is not typically needed prior to biopsy

Parathyroid Gland(s) ⁽³⁷⁾

- Diagnosed hyperparathyroidism when prior imaging (such as ultrasound, nuclear medicine scan) is indeterminate or abnormal and surgery is planned **OR** is being considered

Cranial Nerve Abnormalities

Facial Nerve Paresis/Bell's Palsy/Hemifacial Spasm (CN VII) ^(27,28)

- Facial nerve paresis/ Bell's palsy / hemifacial spasm with atypical features requiring evaluation of the extracranial course of the facial nerve (such as incomplete/no improvement at three months, involvement of only specific branches of the facial nerve, second paralysis of the same side, or facial twitching/spasms prior to onset)

NOTE: MRI Brain with internal auditory canal (IAC) (or CT Head if MRI is contraindicated or not available) with imaging of the intracranial course of the facial nerve is the preferred initial study for facial nerve paresis/ Bell's palsy / hemifacial spasm

Cranial Nerves IX-XII ⁽²⁵⁾

- Clinical evidence of cranial nerve (CN IX, X, XI, and/or XII) deficits or dysfunction (such as dysphagia, shoulder/neck movement abnormalities, tongue movement abnormalities, vocal fold movement or sensation abnormalities)

Brachial Plexopathy ⁽³⁸⁾

- **Traumatic** Brachial Plexopathy:
 - If mechanism of injury is highly suspicious for brachial plexopathy (such as birth trauma, mid-clavicular fracture, shoulder dislocation, contact injury to the neck (burner or stinger syndrome) or penetrating injury)
- **Non-traumatic** Brachial Plexopathy:
 - When Electromyography/Nerve Conduction Velocity (EMG/NCV) studies are suggestive of brachial plexopathy

NOTE: Either Neck MRI, Shoulder MRI or Chest MRI may be appropriate depending on the location of the injury/plexopathy. Only **ONE** of these three studies should be needed to appropriately image the brachial plexus

Combination Studies for Neck MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Neck/Brain MRI

- Objective cranial nerve palsy (CN IX-XII) (for evaluation of the extracranial nerve course) ⁽²⁵⁾
- Bell's Palsy/hemifacial spasm that meets the above criteria ⁽²⁵⁾
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent intracranial pathology ⁽¹⁶⁾

Face/Sinus/Orbit/Neck MRI and PET

- Suspected or known malignancy of the head and/or neck with any **ONE** of the following ⁽¹⁵⁾:
 - For initial staging, restaging, or suspected recurrence of head and neck cancer
 - For surgical or radiation planning
 - 3-4 months after end of treatment in patients with locoregionally advanced disease or with altered anatomy
 - Annually when specified that the area of original disease is difficult to follow with direct visualization and/or endoscopy (such as orbit, nasopharynx, base of tongue, hypopharynx, pyriform sinus)

Sinus/Face/Neck/Chest/Abdomen MRI

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (formally Wegener's Granulomatosis) is indicated with any **ONE** of the following ⁽²¹⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

Brain with IAC/Face/Sinus/Neck MRI

- Facial nerve paresis/Bell's Palsy/hemifacial spasm for evaluation of the entire intracranial and extracranial nerve course with an atypical presentation (such as bilateral

involvement, multiple episodes, slow resolution beyond three weeks, incomplete/no improvement at three months, or facial twitching/spasms prior to onset

- Objective cranial nerve palsy (CN IX-XII) (for evaluation of the entire intracranial and extracranial nerve course) ⁽²⁵⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine

INDICATIONS FOR INTERNAL AUDITORY CANAL (IAC) MRI

Suspected Neoplasm or Malignancy

- Suspicious lesion that is indeterminate or abnormal on prior imaging and requires further evaluation ⁽³¹⁾
- Suspected acoustic neuroma (Schwannoma) or cerebellar pontine angle tumor based on clinical signs and symptoms (such as unilateral sensorineural loss, vertigo, disturbed balance or gait, unilateral/asymmetric tinnitus, facial weakness, or altered sense of taste) ⁽³⁹⁾
- Suspected glomus tumor based on exam and/or prior imaging ⁽³⁹⁾

Infection and Inflammation

- Suspected necrotizing otitis externa (formally known as malignant otitis externa) particularly in high-risk populations (such as immunocompromised, poorly controlled diabetes, prior radiation therapy)
- Clinical suspicion of a complication of acute otitis media including any **ONE** of the following ^(40,41):
 - Systemic illness or toxic appearance
 - Signs/symptoms of possible intracranial complications (such as headache, tinnitus, vertigo, nystagmus)
- Known **OR** suspected cholesteatoma (abnormal growth of epithelial tissue within the middle ear) ⁽⁴²⁾

Cranial Nerve Abnormalities

Facial Nerve Paresis/Bell's Palsy/Hemifacial Spasm (CN VII) ^(27,28)

- Facial nerve paresis/ Bell's palsy / hemifacial spasm with poor prognostic clinical factors (such as complete paresis, incomplete improvement at 3 months, bilateral facial nerve involvement, other cranial nerve deficits, history of malignancy)

Hearing Loss (Documented on Audiogram) (CN VIII) ⁽⁴³⁾

- Congenital hearing loss (unilateral or bilateral, conductive or sensorineural)

NOTE: Congenital refers to a condition, trait, or exposure that is present at birth that is due to genetic factors, non-genetic factors, or a combination of both. However, hearing loss can be mild initially and progress over time after birth, so the diagnosis of congenital hearing loss is not necessarily limited to young children only

- Cochlear implant evaluation (pre-operative or post-operative)
- Asymmetric or unilateral sensorineural hearing loss (SNHL)
- Suspected auditory neuropathy

Tinnitus (CN VIII) ^(39,44)

- Pulsatile tinnitus (unilateral or bilateral) ⁽⁴⁵⁾

NOTE: Vascular imaging (CTA or MRA) of the brain and/or neck may also be indicated in the evaluation of pulsatile tinnitus.

- Non-pulsatile, unilateral or asymmetric tinnitus

NOTE: For non-pulsatile, bilateral tinnitus advanced imaging is indicated **ONLY** based on the type and level of the associated hearing loss (see hearing loss criteria)

Peripheral Vertigo (CN VIII) ^(43,46)

- Advanced imaging is indicated for peripheral vertigo (source within the temporal bone) with **ALL** of the following:
 - Clinical evidence of a peripheral source of vertigo (such as head-Impulse with saccade, spontaneous unidirectional horizontal nystagmus, positive Dix-Hallpike maneuver, Electronystagmography (ENG) testing and/or rotary chair testing indicating peripheral vertigo)
 - Persistent symptoms after a trial of pharmacotherapy (such as meclizine, diazepam) **AND** four weeks or more of vestibular therapy (such as Epley's maneuvers, vestibular rehabilitation)

NOTE: For patients with suspected central vertigo (source within the central nervous system (CNS)) imaging with MRI Brain (or CT Head if MRI is contraindicated or not available) is indicated

Cerebral Spinal Fluid (CSF) Otorrhea (47,48)

- MRI IAC imaging for possible CSF otorrhea (or secondary CSF rhinorrhea via the eustachian tube) is indicated with any **ONE** of the following ⁽⁹⁾
 - High index of suspicion of CSF leak based on clinical evidence (such as persistent leaking, worse leaking with provocative maneuvers (Valsalva), positive Beta-2 transferrin assay of the leakage)
 - Prior imaging (such as CT, nuclear medicine imaging) suggesting bony defect/lesion contributing to suspected/known CSF leak

Vascular Abnormalities (49)

- Advanced imaging of a known or suspected vascular abnormality of the temporal bone is indicated for any **ONE** of the following:
 - Suspected glomus tumor based on exam and/or prior imaging
 - Other vascular abnormality where the need for advanced imaging is clearly documented

Imaging in Known Genetic Conditions

- Von Hippel-Lindau (VHL): once at age 15-20 (asymptomatic) **OR** at onset of hearing loss, tinnitus or vertigo ⁽⁵⁰⁾

NOTE: If performed with Brain MRI, separate authorization for IAC MRI is not needed

Combination Studies for MRI IAC

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

CT Internal Auditory Canal (IAC) / MRI IAC

- CT IAC/MRI IAC are both indicated prior to cochlear implantation with any **ONE** of the following:
 - Genetic syndrome diagnosis (such as Usher syndrome, Pendred syndrome, Waardenburg syndrome, Branchio-Oto-Renal (BOR) syndrome, Trisomy 21)
 - Known temporal bone anatomic abnormality (such as enlarged vestibular aqueduct, aural atresia, aberrant facial nerve)
 - History of prior temporal bone surgery
 - History of meningitis
 - Mixed hearing loss (conductive hearing loss and sensorineural hearing loss)
 - Extensive history of otitis media

- Pediatric patient where sedation will be needed to complete either study

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative evaluation:

- Known or suspected complications
- A clinical reasoning is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

LEGISLATIVE LANGUAGE

Washington

20150515A – Imaging for Rhinosinusitis ⁽⁵¹⁾

Washington State Health Care Authority Technology Assessment

Health Technology Clinical Committee

HTTC Coverage Determination:

Imaging for Rhinosinusitis is a **covered benefit with conditions** consistent with the criteria identified in the reimbursement determination.

HTCC Reimbursement Determination:

Limitations of Coverage

Imaging with Sinus Computed Tomography (CT) is covered in the context of rhinosinusitis for the following:

- Red Flags* OR
- Persistent Symptoms** > 12 weeks AND failure of medical therapy; OR
- Surgical planning
- Repeat scanning is not covered except for Red Flags or Surgical Planning

Magnetic Resonance Imaging (MRI) of the sinus is covered in the context of rhinosinusitis for the following:

- As above for sinus CT AND < 18 years of age OR pregnant

***Red Flags in the setting of Rhinosinusitis:** (From American Academy of Otolaryngology – Head and Neck Surgery (AAO-HNS))

- Swelling of orbit
- Altered mental status
- Neurological findings
- Signs of meningeal irritation
- Severe headache
- Signs of intracranial complication, including, but not limited to:
 - Meningitis,
 - Intracerebral abscess
 - Cavernous sinus thrombosis
- Involvement of nearby structures, including, but not limited to:
 - Periorbital cellulitis

****Persistent Symptoms defined as $\geq$ two of the following:** (From AAO-HNS)

- Facial pain-pressure-fullness
- Mucopurulent drainage
- Nasal obstruction (congestion)
- Decreased sense of smell

Non-Covered Indicators

- Imaging of the sinus for rhinosinusitis using X-ray OR Ultrasound is not covered.

CODING AND STANDARDS

Codes

70540, 70542, 70543, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Orbits Vision and Visual Loss ⁽²⁾

Study Design: This document is a guideline developed by the American College of Radiology (ACR) for the appropriate use of imaging in patients with visual loss. It is based on a systematic review of the medical literature and expert consensus.

Target Population: Patients with visual loss, including those with traumatic visual defects, nontraumatic orbital asymmetry, suspected orbital cellulitis, optic neuritis, and other conditions affecting the visual pathway.

Key Factors: The guideline emphasizes the use of CT and MRI as primary imaging modalities, with specific recommendations for different clinical scenarios. It also highlights the importance of

a compartmental approach to establish a differential diagnosis based on lesion location and clinical features.

Clinical Practice Guideline (Update): Adult Sinusitis ⁽¹⁸⁾

Study Design: This is an update of a 2007 clinical practice guideline by the American Academy of Otolaryngology—Head and Neck Surgery Foundation. It is based on evidence from systematic reviews, randomized controlled trials, and expert consensus.

Target Population: Adults with rhinosinusitis, including acute bacterial rhinosinusitis (ABRS) and chronic rhinosinusitis (CRS).

Key Factors: The guideline provides recommendations for the diagnosis and management of rhinosinusitis, including the use of antibiotics, imaging, and symptomatic relief. It emphasizes the importance of distinguishing between viral and bacterial rhinosinusitis and includes new recommendations for managing CRS with nasal polyps.

ACR Appropriateness Criteria® Cranial Neuropathy: 2022 Update ⁽²⁵⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for imaging in patients with cranial neuropathy. It is based on a systematic review of the medical literature and expert consensus.

Target Population: Patients with cranial neuropathy, including those with anosmia, trigeminal neuralgia, facial nerve palsy, and other cranial nerve disorders.

Key Factors: The guideline provides recommendations for the use of MRI and CT in the evaluation of cranial neuropathy, with specific imaging protocols for different cranial nerves. It also discusses the importance of a detailed neurological examination and the use of advanced imaging techniques.

ANALYSIS OF EVIDENCE

Analysis ^(2,18,25):

While all three articles emphasize the importance of imaging and evidence-based guidelines, they differ in their focus areas, clinical scenarios, and management recommendations. Kennedy 2018 focuses on visual loss, Rosenfeld 2015 on rhinosinusitis, and Rath 2022 on cranial neuropathies. Each article provides valuable insights and guidelines for their respective areas, highlighting the importance of a multidisciplinary approach and the use of appropriate imaging techniques.

Shared Conclusions

- **Imaging Modalities:** All three articles emphasize the importance of imaging in diagnosing and managing various conditions. They agree that MRI and CT scans are primary tools for evaluating different pathologies. For instance, Kennedy 2018 highlights the use of CT and MRI for visual loss, Rath 2022 discusses MRI and CT for cranial neuropathies, and Rosenfeld 2015 mentions CT for sinusitis.

- **Evidence-Based Guidelines:** Each article stresses the importance of evidence-based guidelines. Kennedy 2018 and Rath 2022 both follow the ACR Appropriateness Criteria, which are reviewed annually by expert panels. Similarly, Rosenfeld 2015 provides evidence-based recommendations for managing adult rhinosinusitis.
- **Multidisciplinary Approach:** The articles advocate for a multidisciplinary approach to diagnosis and treatment. Kennedy 2018 and Rath 2022 involve expert panels from various specialties, while Rosenfeld 2015 includes a guideline update group with diverse medical professionals.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This guideline replaces Evolent Clinical Guideline 014 for Sinus, Face, Orbit, Neck, and Internal Auditory Canal MRI ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Clarified indications for anosmia, facial nerve paresis, tinnitus, vertigo, granulomatosis polyangiitis (GPA), nasal polyposis, and CSF leak ● Added necrotizing otitis externa, thyroid goiter indications ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Updated language in the preoperative/postoperative section ● Removed Genetics section ● Updated and expanded references ● Reduced background
June 2024	● References Updated ● Background updated ● Contraindications and preferred studies section added to the background ● Expanded combination section ● Clarified traumatic and non-traumatic brachial plexopathy

Date	Summary
	• Added Hereditary Paraganglioma-Pheochromocytoma (PGL/PCC) Syndrome (SDHx mutations) every 2 years when whole body MRI (CPT 76498) is not available • Added follow-up of known cancer section (initial staging, restaging, surveillance) • Added Legislative Language for the State of Washington

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guideline 2011 for Brain Magnetic Resonance Angiography (MRA)

Guideline Number: Evolent_CG_2011	<u>Applicable Codes</u>	
<i>"Evolent" refers to Evolent Health LLC and Evolent Specialty Services, Inc.</i> <i>© 1997 - 2026 Evolent. All rights Reserved.</i>		
Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for performing magnetic resonance angiography (MRA) in the head/brain region.

Special Note

Brain MRI/MRA are not approvable simultaneously unless they meet the criteria described below in the indications for Brain MRI/Brain MRA combination studies section. If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combination Studies** section for indicated combinations below)

NOTE: Authorization for MR Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR BRAIN MR ANGIOGRAPHY

Evaluation of Suspected Intracranial Vascular Disease ^(1,2)

Aneurysm Screening

- Screening for intracranial aneurysm if two or more first-degree family members (parent, brother, sister, or child) with history of intracranial aneurysm ^(1,3)

- **Note:** Repeat study is recommended every 5-7 years ⁽³⁾
- For one first degree relative with aneurysm, asymptomatic screening is not indicated and would require a neurological sign or symptom supporting clinical concern for aneurysm ⁽⁴⁾
- Screening for aneurysm in high-risk populations ⁽¹⁾:
 - KNOWN genetic syndromes (see Imaging in Known Genetic Conditions)
 - Bicuspid aortic valve
 - Known aortic diseases (aneurysm, coarctation, dissection)

Suspected Vascular Abnormalities

- Suspected high flow vascular malformation (arteriovenous malformation (AVM) or dural arteriovenous fistula) in patient with previous or indeterminate imaging study ^(1,2)
 - **Note:** MRI is the study of choice for detecting low-flow vascular malformations such as cavernomas, developmental venous anomalies and capillary telangiectasia ⁽²⁾
- Thunderclap headache with continued concern for underlying vascular abnormality (i.e., aneurysm or reversible cerebral vasoconstriction syndrome) after initial negative brain imaging ⁽⁵⁻⁷⁾
 - **Note:** Negative brain CT < 6 hours after headache onset excludes subarachnoid hemorrhage in neurologically intact patients. ⁽⁷⁾ MRI lacks sensitivity in excluding subarachnoid hemorrhage less than 24 hours after headache onset. ^(5,8)
- Headache associated with exercise, exertion, or sexual activity ^(5,9)
- Isolated third nerve palsy (oculomotor) with pupil involvement to evaluate for aneurysm ^(10,11)
- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis)
 - **NOTE:** CTA/MRA of the chest and neck may also be indicated
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ⁽¹²⁻¹⁴⁾

Cerebrovascular Disease

Ischemic

- Recent ischemic stroke or transient ischemic attack ^(15,16)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech. ⁽¹⁷⁻¹⁹⁾
- Suspected carotid or vertebral artery dissection (secondary to trauma or spontaneous) ^(16,20,21)

Hemorrhagic

- Known subarachnoid hemorrhage (SAH) ^(1,2)
- Known cerebral intraparenchymal hemorrhage with concern for underlying vascular abnormality ^(2,16)

Venous ^(16,22)

- Suspected central venous thrombosis and ANY ONE of the following:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- Distinguishing benign intracranial hypertension (pseudotumor cerebri) from dural sinus thrombosis

Vasculitis and Other Intracranial Vascular Disease

- Known vasculitis or autoimmune disease with concern for secondary CNS vasculitis based on neurological signs or symptoms
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ^(1,23)
- Large vessel vasculitis:
 - Giant cell arteritis with suspected intracranial involvement ⁽²⁴⁾
 - Takayasu's Arteritis ⁽²⁵⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years
- Suspected Moyamoya disease ^(2,26)
- Suspected reversible cerebral vasoconstriction syndrome ^(22,27)
- For patients with fibromuscular dysplasia (FMD) ^(28,29):
 - One-time vascular study from brain to pelvis
- Spontaneous coronary arteries dissection (SCAD) ⁽³⁰⁾:
 - One-time vascular study from brain to pelvis

Evaluation of Known Intracranial Vascular Disease ^(1,2)

- Known intracranial aneurysm, treated aneurysm, or known vascular malformation (i.e., AVM or dural arteriovenous fistula)
- Known vertebrobasilar insufficiency with new or worsening signs or symptoms

(VBI) ^(17,19,31)

- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(16,32,33):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Known vasculitis, reversible cerebral vasoconstriction syndrome or Moyamoya disease ^(2,26,27,34)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation ⁽¹⁵⁾:

- Refractory trigeminal neuralgia or hemifacial spasm when done for surgical evaluation ⁽³⁵⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- ADPKD (Autosomal Dominant Polycystic Kidney Disease) ⁽³⁶⁾:
 - Every 10 years (including at diagnosis)
- Fabry Disease ⁽³⁷⁾:
 - Every 2 years (including at diagnosis) starting at age 18 OR
 - More frequently if symptomatic
- Loeys-Dietz ⁽³⁸⁾:
 - Every two years (including at diagnosis) OR
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽³⁹⁾:
 - Every 18 months (including at diagnosis) OR
 - As clinically indicated to follow known vascular abnormalities

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain MRI and MRA

- Fabry Disease ⁽³⁷⁾:
 - Every 2 years (including at diagnosis) starting at age 18 OR
 - More frequently if symptomatic
- Sickle Cell Disease ^(40,41):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s
 - New neurologic or cognitive concerns (including TIA, no formal testing required)
 - When cessation or changing frequency of transfusions is under consideration

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Loeys-Dietz ⁽³⁸⁾:
 - Every two years (including at diagnosis) OR
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽³⁹⁾:
 - Every 18 months (including at diagnosis) OR

- As clinically indicated to follow known vascular abnormalities

OTHER COMBINATION STUDIES WITH BRAIN MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck MRA

- Recent ischemic stroke or transient ischemic attack (TIA) ^(15,16)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech ^(17–19,31)
- Suspected carotid ⁽⁴²⁾ or vertebral ⁽⁴³⁾ artery dissection (secondary to trauma ⁽⁴⁴⁾ or spontaneous) ^(16,20,45)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(16,32,33):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽²⁴⁾
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis $\geq 70\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(16,46)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(16,46)
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(12,13)

Brain MRI and Brain MRA

- Recent ischemic stroke or transient ischemic attack (TIA) ^(15,16)
- Thunderclap headache with continued concern for underlying vascular abnormality (i.e., aneurysm or reversible cerebral vasoconstriction syndrome) after initial negative brain

imaging ^(5–7,22)

- **Note:** Negative brain CT < 6 hours after headache onset excludes subarachnoid hemorrhage in neurologically intact patients. ⁽⁷⁾ MRI lacks sensitivity in excluding subarachnoid hemorrhage less than 24 hours after headache onset. ^(5,8)
- Acute, sudden onset of headache with personal history of a vascular abnormality or first-degree family history of aneurysm ^(1,22)
- Headache associated with exercise, exertion, or sexual activity ⁽⁵⁾
- Suspected central venous thrombosis and ANY ONE of the following ⁽¹⁶⁾:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or Covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- See **Imaging in Known Genetic Conditions** for additional indications
- Known Moyamoya disease ^(2,26) or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms ^(22,27)
- Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies ⁽¹⁾
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ^(1,23,47)
- Giant cell arteritis with suspected intracranial involvement ⁽²⁴⁾

Brain MRI and Brain/Neck MRA ^(2,16)

- Recent ischemic stroke or transient ischemic attack (TIA) ^(15,16)
- History of stroke and **ONE** of the following:
 - No prior workup
 - New neurologic signs or symptoms
- Suspected or known carotid or vertebral artery dissection with focal or lateralizing neurological deficits
- Pulsatile tinnitus with concern for a suspected arterial vascular and/or intracranial etiology ^(12–14)
 - **NOTE:** For the indication of pulsatile tinnitus the Brain MRI of the combination should include the Internal Auditory Canal (IAC)
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽²⁴⁾

Note: CTA and MRA are generally comparable noninvasive imaging alternatives each with their own advantages and disadvantages. Brain MRI can be combined with Brain CTA/Neck CTA.

Brain/Neck/Chest MRA

- Non central Horner's syndrome (secondary/preganglionic or tertiary/post-ganglionic) for evaluation of underlying vascular source (such as dissection, aneurysm, arteritis) ^(48,49)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(28,29)
- For assessment in patients with spontaneous coronary artery dissection (SCAD) (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)) ⁽⁵⁰⁾
 - **NOTE:** Body vascular imaging for SCAD can be performed at the time of coronary angiography
- Takayasu's Arteritis ⁽²⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

CODING AND STANDARDS

Codes

70544, 70545, 70546

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

General Overview

Pulsatile tinnitus

Pulsatile tinnitus has many etiologies, and the choice of study should be based on accompanying signs and symptoms. For general screening MRI brain with IAC/MRA brain and neck is approvable. If IIH is suspected (typically with headache and vision changes in a younger woman with a high BMI), MRI/MRV brain is indicated. If there is concern for vascular etiology, CTA or MRA brain/neck is indicated. If there is associated hearing loss and neurological signs/symptoms, MRI brain with IAC is indicated. If the temporal bone is suspected to be involved and/or retrotympenic lesion seen on otoscopy, CT temporal bone/IAC is indicated. If there is concurrent concern for bony and a vascular issue, CTA of the head and neck can be used to evaluate both.

MRA and Dissection

Craniocervical dissections can be spontaneous or traumatic. Spontaneous dissection presents with headache, neck pain with neurological signs or symptoms. There is often minor trauma or precipitating factor (i.e., exercise, neck manipulation).. Dissection of the extracranial vessels can extend intracranially and/or lead to thrombus which can migrate into the intracranial circulation, causing ischemia. Therefore, MRA of the head and neck is warranted. ^(20,51)

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Cerebrovascular Diseases-Aneurysm, Vascular Malformation, and Subarachnoid Hemorrhage ⁽¹⁾

Study Design: The study design involves a detailed literature review and expert panel recommendations to establish imaging guidelines for various cerebrovascular conditions. The criteria are based on the latest evidence and expert consensus to ensure appropriate imaging procedures are selected for different clinical scenarios.

Target Population: The target population includes patients with cerebrovascular diseases such as aneurysms, vascular malformations, and SAH. Specific variants address different clinical presentations, including known acute SAH, suspected cerebral vasospasm, untreated cerebral

aneurysms, previously treated cerebral aneurysms, high-risk cerebral aneurysm screening, known high-flow vascular malformations, and suspected CNS vasculitis.

Key Factors:

Imaging Recommendations: The document outlines the appropriateness of various imaging modalities, including arteriography, CTA, MRA, MRI, and ultrasound, for different clinical scenarios. Each variant provides specific recommendations based on the clinical presentation and the relative radiation level associated with each imaging procedure.

Clinical Presentations: The criteria cover a wide range of clinical presentations, from acute SAH to surveillance monitoring of untreated and treated aneurysms, as well as screening for high-risk populations and evaluation of suspected CNS vasculitis.

Expert Panel: The recommendations are developed by an expert panel on neurological imaging, including specialists from various institutions and organizations. The panel's collaboration ensures a comprehensive and well-rounded approach to imaging guidelines.

Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition ⁽⁵⁾

Study Design: The ICHD-3 is a systematic classification of headache disorders based on extensive research and clinical studies. The classification is hierarchical, allowing for detailed diagnosis from the first-digit level to the fifth. The criteria for each headache type are based on clinical features, diagnostic criteria, and evidence from field-testing studies.

Target Population: The target population includes individuals experiencing various types of headaches, ranging from primary headaches like migraines and tension-type headaches to secondary headaches attributed to other disorders. The classification is intended for use by healthcare professionals, including neurologists, general practitioners, and researchers, to diagnose and manage headache disorders.

Key Factors:

Primary Headaches: The document classifies primary headaches into categories such as migraines, tension-type headaches, and trigeminal autonomic cephalalgias. Each category includes specific diagnostic criteria, clinical features, and comments on pathophysiology and treatment.

Secondary Headaches: These are headaches attributed to other disorders, such as trauma, vascular disorders, infections, and psychiatric disorders. The classification provides criteria for diagnosing secondary headaches based on the temporal relationship between the headache and the underlying disorder.

Diagnostic Criteria: The criteria for each headache type include the number of attacks, duration, pain characteristics, associated symptoms, and exclusion of other diagnoses. For example, migraine without aura requires at least five attacks lasting 4-72 hours with specific pain characteristics and associated symptoms like nausea and photophobia.

Field Testing: The classification includes results from field-testing studies that validate the diagnostic criteria. These studies involve large populations and use advanced diagnostic methods like neuroimaging and genetic testing.

Clinical and Research Applications: The ICHD-3 is designed for both clinical practice and research. It helps clinicians diagnose and manage headache disorders and provides a standardized framework for researchers to study headache epidemiology, pathophysiology, and treatment.

ACR Appropriateness Criteria® Cerebrovascular Diseases-Stroke and Stroke-Related Conditions ⁽¹⁶⁾

Study Design: The document is a guideline developed by the American College of Radiology (ACR) Appropriateness Criteria Expert Panel on Neurological Imaging. It is based on a systematic analysis of medical literature from peer-reviewed journals and follows established methodology principles such as the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) and the RAND/UCLA Appropriateness Method.

Target Population: The guidelines are intended for use by radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment for patients with cerebrovascular diseases, including stroke and stroke-related conditions.

Key Factors:

Conditions Covered: The guidelines encompass a wide range of cerebrovascular diseases, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, and cerebral venous sinus thrombosis. They also address complications such as intraparenchymal hemorrhage and completed ischemic strokes.

Imaging Recommendations: The document provides evidence-based guidelines for appropriate imaging examinations for diagnosis and treatment of specified medical conditions. It includes recommendations for various imaging modalities such as CT, MRI, MRA, and ultrasound.

Clinical Scenarios: The guidelines cover different clinical scenarios, including transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage, among others.

Methodology: The guideline development and revision process involves a multidisciplinary expert panel and supports the systematic analysis of medical literature. In instances where peer-reviewed literature is lacking or equivocal, expert opinions are used to formulate recommendations.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,5,16):

1. **Diagnostic Imaging:** All three articles emphasize the importance of diagnostic imaging in identifying and managing cerebrovascular conditions. They discuss various imaging modalities such as CT, MRI, MRA, and CTA, highlighting their roles in diagnosing conditions like stroke, aneurysms, and vascular malformations.

2. **Clinical Guidelines:** The articles provide clinical guidelines for the management of cerebrovascular diseases. They stress the need for evidence-based approaches and the use of standardized criteria to ensure accurate diagnosis and effective treatment.
3. **Risk Factors:** Each article discusses the risk factors associated with cerebrovascular diseases, including hypertension, smoking, and genetic predispositions. They highlight the importance of identifying these risk factors to prevent and manage conditions effectively.

POLICY HISTORY

Date	Summary
July 2025	● Fixed a sentence-spacing error in the Background ● Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	● Guideline name changed from Brain MRA_MRV to Brain Magnetic Resonance Angiography (MRA) ● Guideline number changed from 004-2 to 2011 ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references ● Updated background section ● Updated combination section ● Updated and rearranged the genetic section ● Removed headache with Valsalva ● Clarified low and high flow vascular malformation ● Clarified central Horner's ● Clarified CVT ● Clarified secondary CNS vasculitis ● Clarified follow-up of known carotid or vertebral artery dissection ● Added intervals for imaging of Takayasu arteritis ● Added history of stroke and no prior workup or new neurologic

Date	Summary
	signs or symptoms
June 2024	● Updated references ● Updated background section ● Updated combination section ● Clarified ○ Frequency of screening in genetic syndromes ● Added ○ Screening for aneurysm in high-risk populations ○ Bicuspid aortic valve ○ Known aortic diseases (aneurysm, coarctation, dissection) ○ Suspected carotid or vertebral artery dissection; secondary to trauma or spontaneous due to weakness of vessel wall (already in combo) ○ Follow-up of known carotid or vertebral artery dissection within 3-6 months for evaluation of recanalization and/or to guide anticoagulation treatment (already in combo) ○ Horner's syndrome, non-central (miosis, ptosis, and anhidrosis) - also in combo section ○ Vessel wall MRI (ordered as Brain MRI) can also be performed in the evaluation of vasculitides ○ Genetic syndromes and rare disease section. ○ Refractory trigeminal neuralgia or hemifacial spasm when done for surgical evaluation ○ Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms (Brain MRA/MRI combo) ○ Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies (Brain MRA /MRI combo) ○ Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up (Brain MRA /MRI combo) ○ Large vessels vasculitis with suspected intracranial and extracranial involvement (Brain MRA /Neck/ Brain MRI combo)

Date	Summary
	○ Giant cell arteritis with suspected intracranial involvement (combos) ● Deleted ○ MRI Brain with IAC/MRA Head/MRA Neck section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2041 for Neck Magnetic Resonance Angiography (MRA)

Guideline Number: Evolent_CG_2041	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for performing Magnetic Resonance Angiography (MRA) in the neck/cervical region.

Special Note

If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combination Studies** section for indicated combinations below)

NOTE: Authorization for MR Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR NECK MR ANGIOGRAPHY

Cerebrovascular Disease

- Recent ischemic stroke or transient ischemic attack ^(1–3)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both

sides of the body, or abnormal speech ^(4,5)

- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 70\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ^(1,2)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., carotid stenosis $\geq 50\%$, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) ^(1,2)

Tumor/Pulsatile Mass

- Pulsatile mass on exam ⁽⁶⁾
- Known carotid body tumors, or other masses such as a paraganglioma, arteriovenous fistula, pseudoaneurysm, atypical lymphovascular malformation ^(6,7)

Note: Ultrasound (US) may be used to identify a mass overlying or next to an artery in initial work up of a pulsatile mass.

Vasculitis and Other Extracranial Vascular Diseases

- Large vessel vasculitis ⁽⁸⁾
 - Giant cell with suspected extracranial involvement ⁽⁹⁾
 - Takayasu's Arteritis ⁽¹⁰⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years
- For patients with fibromuscular dysplasia (FMD) ^(11,12):
 - One-time vascular study from brain to pelvis
- Spontaneous coronary arteries dissection (SCAD) ⁽¹³⁾
 - One-time vascular study from brain to pelvis
- Subclavian steal syndrome when ultrasound is positive or indeterminate OR for planning an intervention ^(14,15)
- Suspected carotid or vertebral artery dissection (secondary to trauma or spontaneous) ^(1,16,17)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(18,19):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest

progression

- To identify an arterial source of bleeding in patients with hemorrhage of the head and neck ⁽⁷⁾
- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) with any **ONE** of the following ^(20,21):
 - For evaluation of a possible underlying vascular issue
 - Associated ipsilateral orbital, face, and/or neck pain that could indicate a possible contributing carotid artery dissection

NOTE: Vascular imaging of the brain and chest may also be indicated

- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(7,22)
- For further evaluation of a congenital vascular malformation of the head and neck ⁽⁷⁾
- Known extracranial vascular disease that needs follow-up or further evaluation ⁽⁷⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINANT FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- Loeys-Dietz ⁽²³⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁴⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Loeys-Dietz ⁽²³⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequently if abnormalities are found
- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁴⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

OTHER COMBINATION STUDIES WITH NECK MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain MRI and Brain/Neck MRA ^(1,3)

- Recent ischemic stroke or transient ischemic attack (TIA) ^(1,25)
- History of stroke and **ONE** of the following:
 - No prior workup
 - New neurologic signs or symptoms
- Suspected or known carotid or vertebral artery dissection with focal or lateralizing neurological deficits
- Pulsatile tinnitus with concern for a suspected arterial vascular and/or intracranial etiology ^(22,26,27)

- **NOTE:** For the indication of pulsatile tinnitus the Brain MRI of the combination should include the Internal Auditory Canal (IAC)
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽⁹⁾

Note: CTA and MRA are generally comparable noninvasive imaging alternatives each with their own advantages and disadvantages. Brain MRI can be combined with Brain CTA/Neck CTA.

Brain/Neck MRA

- Recent ischemic stroke or transient ischemic attack (TIA) ^(1,25)
 - **Note:** For remote strokes with no prior vascular imaging, imaging can be considered based on location/type of stroke and documented potential to change management
- Known or suspected vertebrobasilar insufficiency (VBI) in patients with symptoms such as dizziness, vertigo, headaches, diplopia, blindness, vomiting, ataxia, weakness in both sides of the body, or abnormal speech ^(4,28,29)
- Suspected carotid ⁽³⁰⁾ or vertebral ⁽³¹⁾ artery dissection (secondary to trauma ⁽³²⁾ or spontaneous) ^(1,16,17)
- Follow-up of known carotid or vertebral artery dissection with any **ONE** of the following ^(1,18,19):
 - At 3-6 months post dissection (for evaluation of recanalization or to guide anticoagulation treatment)
 - When documentation is provided that the results will be used to guide anticoagulation treatment
 - When there is recurrent pain, headache or new neurologic deficits that suggest progression
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽⁹⁾
- Asymptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis > 70%, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(1,2)
- Symptomatic patients with an abnormal ultrasound of the neck or carotid duplex imaging (e.g., internal carotid stenosis ≥ 50%, technically limited study, aberrant direction of flow in the carotid or vertebral arteries) and patient is surgery or angioplasty candidate ^(1,2)
- Pulsatile tinnitus to identify a suspected arterial vascular etiology ^(7,22)

Brain/Neck/Chest MRA

- Non central Horner's syndrome (secondary/preganglionic or tertiary/post-ganglionic) for evaluation of underlying vascular source (such as dissection, aneurysm, arteritis) ^(20,21)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to

pelvis is indicated ^(11,12)

- For assessment in patients with spontaneous coronary artery dissection (SCAD) (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)) ⁽³³⁾
 - **NOTE:** Body vascular imaging for SCAD can be done at time of coronary angiography
- Takayasu's Arteritis ⁽¹⁰⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

CODING AND STANDARDS

Codes

70547, 70548, 70549

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

MRA and Dissection

Craniocervical dissections can be spontaneous or traumatic. Spontaneous dissection presents with headache, neck pain with neurological signs or symptoms. There is often minor trauma or precipitating factor (e.g., exercise, neck manipulation). Dissection of the extracranial vessels can extend intracranially and/or lead to thrombus, which can migrate into the intracranial circulation causing ischemia. Therefore, MRA of the head and neck is warranted. ^(17,34)

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include:

impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

Society for Vascular Surgery clinical practice guidelines for management of extracranial cerebrovascular disease ⁽²⁾

Study Design: This document presents clinical practice guidelines for the management of extracranial cerebrovascular disease, specifically carotid bifurcation stenosis in stroke prevention. The guidelines are based on extensive investigations, including multiple randomized controlled trials (RCTs) and systematic reviews.

Target Population: The guidelines focus on patients with carotid bifurcation disease, including both symptomatic and asymptomatic patients with varying degrees of carotid artery stenosis.

Key Factors:

- **Carotid Endarterectomy (CEA) vs. Medical Therapy:** CEA is recommended over maximal medical therapy for low-risk patients with asymptomatic carotid bifurcation atherosclerosis and stenosis of >70%.
- **CEA vs. Transfemoral Carotid Artery Stenting (TF-CAS):** CEA is recommended over TF-CAS for low surgical risk patients with symptomatic carotid artery stenosis of >50%.
- **Timing of Carotid Intervention:** Carotid revascularization is recommended for symptomatic patients with >50% stenosis to be performed as soon as the patient is neurologically stable after 48 hours but definitely before 14 days after symptom onset.
- **Screening for Carotid Artery Stenosis:** Routine screening for asymptomatic carotid artery stenosis in individuals without cerebrovascular symptoms or significant risk factors is not recommended.
- **Optimal Sequence for Intervention:** For patients with symptomatic carotid stenosis of 50% to 99% who require both CEA and coronary artery bypass grafting (CABG), CEA before or concomitant with CABG is suggested.

ACR–ASNR–SNIS–SPR Practice Parameter for the Performance of Cervicocerebral Magnetic Resonance Angiography (MRA) ⁽⁷⁾

Study Design: This document outlines the practice parameters for the performance of cervicocerebral magnetic resonance angiography (MRA) by the American College of Radiology (ACR), the American Society of Neuroradiology (ASNR), the Society of NeuroInterventional Surgery (SNIS), and the Society for Pediatric Radiology (SPR).

Target Population: The guidelines are intended for practitioners performing MRA on patients with various vascular diseases of the brain, head, and neck, including both adult and pediatric populations.

Key Factors:

- **Indications for MRA:** Detection and evaluation of atherosclerotic or nonatherosclerotic steno-occlusive disease, traumatic injury, aneurysms, arteriovenous malformations, vasculitis, tumor vascular supply, and other vascular anomalies.
- **Safety Guidelines:** The document emphasizes the importance of adhering to safety guidelines and possible contraindications, including the use of contrast agents and sedation.
- **Examination Technique:** Various MRA techniques are described, including noncontrast TOF MRA, contrast-enhanced MRA, phase-contrast MRA, arterial spin-labeling MRA, and MR vessel wall imaging.
- **Documentation:** Proper documentation of the examination and findings is crucial for effective communication and patient care.

ACR Appropriateness Criteria Cerebrovascular Diseases-Stroke and Stroke-Related Condition ⁽¹⁾

Study Design: This document provides the ACR Appropriateness Criteria for cerebrovascular diseases, stroke, and stroke-related conditions. The guidelines are evidence-based and reviewed annually by a multidisciplinary expert panel.

Target Population: The criteria focus on patients with stroke-related conditions, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, cerebral venous sinus thrombosis, intraparenchymal hemorrhage, and completed ischemic strokes.

Key Factors:

- **Imaging Recommendations:** The document outlines imaging recommendations for various clinical scenarios, including initial imaging for transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and surveillance imaging for prior ischemic infarct.
- **Variants:** The criteria include specific variants for different clinical presentations, such as TIA, acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage.
- **Relative Radiation Levels:** The document provides relative radiation levels for different imaging procedures to help guide the selection of appropriate imaging techniques.
- **Summary of Literature Review:** The guidelines are based on a systematic analysis of the medical literature from peer-reviewed journals and expert opinions.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,2,7):

- **Non-Invasive Nature:** All three articles emphasize the non-invasive nature of MRA, which makes it a safer alternative to traditional catheter-based angiography. This is particularly important for patients who may be at risk for complications from invasive procedures.
- **Diagnostic Utility:** MRA is consistently highlighted as a valuable diagnostic tool for assessing vascular diseases, including carotid stenosis, intracranial aneurysms, and arteriovenous malformations. The articles agree that MRA provides detailed imaging that can help in the diagnosis and management of these conditions.
- **Limitations:** All three articles acknowledge the limitations of MRA, such as lower spatial resolution compared to CT angiography (CTA) and susceptibility to artifacts from patient movement or turbulent blood flow

Conclusion ^(1,2,7)

In summary, while all three articles agree on the non-invasive nature and diagnostic utility of MRA, they differ in their specific indications, technical aspects, and clinical recommendations. AbuRahma et al 2022 focuses on extracranial cerebrovascular disease, ACR–ASNR–SNIS–SPR MRA provides a comprehensive overview of MRA techniques and indications, and Pannell et al 2024 offers detailed guidelines for the use of MRA in cerebrovascular diseases and stroke management. These differences highlight the versatility of MRA in various clinical contexts and the importance of tailored guidelines for its use.

POLICY HISTORY

Date	Summary
July 2025	● Fixed a spelling typo in the Vasculitis and Other Extracranial Vascular Disease ○ Changed “identity” to “identify” ● Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	● Guideline name changed from Neck MRA_MRV to Neck Magnetic Resonance Angiography (MRA) ● Guideline number changed from 012-2 to 2041 ● Added new bullet-point to the General Statement section ● Updated references ● Updated background section

Date	Summary
	● Updated and rearranged the genetic section ● Added Vasculitis and Other Extracranial Vascular Diseases section ● Added intervals for imaging of Takayasu arteritis ● Clarified follow-up of known carotid or vertebral artery ● Clarified central Horner's Syndrome to evaluate for a vascular source ● Added history of stroke and no prior workup or new neurologic signs or symptoms ● Added a Summary of Evidence and Analysis of Evidence
June 2024	● Updated references ● Updated background section ● Updated combination section ● Clarified ○ Frequency of screening in genetic syndromes ● Added ○ Follow-up of known carotid or vertebral artery dissection within 3-6 months for evaluation of recanalization and/or to guide anticoagulation treatment (already in combo) ○ Horner's syndrome, non-central (miosis, ptosis, and anhidrosis) - also in combo section ○ Genetic syndromes and rare disease section ○ Giant cell arteritis with suspected intracranial and extracranial involvement (combos) ○ Large vessel vasculitis (Giant cell or Takayasu arteritis) with suspected intracranial and extracranial involvement (combos) ● Deleted ○ Aneurysm screening section ○ MRI Brain with IAC/MRA Head/MRA Neck section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evotent Clinical Guideline 2012 for Brain Magnetic Resonance Imaging (MRI) With or Without Internal Auditory Canal (IAC) Views

Guideline Number: Evotent_CG_2012	<u>Applicable Codes</u>	
<i>"Evotent" refers to Evotent Health LLC and Evotent Specialty Services, Inc.</i> <i>© 1997 - 2026 All rights Reserved</i>		
Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Brain Magnetic Resonance Imaging (MRI) and Magnetic Resonance Angiography (MRA) are not simultaneously approvable unless they meet the criteria described below in the Indications for **Brain MRI/Brain MRA** combination studies section. If there is a combination request for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) the results of the prior study should show one or more of the following:

- Inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(See **Combination Studies** section for indicated combinations below)

Purpose

Brain (head) MRI is the procedure of choice for most brain disorders. It provides clear images of the brainstem and posterior brain, which are difficult to view on a CT scan. It is also useful for the diagnosis of demyelinating disorders (such as multiple sclerosis (MS) that cause destruction of the myelin sheath of the nerve). The evaluation of blood flow and the flow of cerebrospinal fluid (CSF) is possible with this non-invasive procedure.

INDICATIONS

Headache ^(1,2)

Evaluation of Headache

- Acute, sudden onset headache (< 4 weeks), with any ONE of the following:
 - A personal or family history (brother, sister, parent, or child) of brain aneurysm or AVM (arteriovenous malformation)
 - < 48 hours of “worst headache in my life” or “thunderclap” headache (Sudden onset new headache reaching maximum intensity within 2-3 minutes, lasting more than 5 minutes)
 - Prior history of stroke or intracranial bleed
 - Known coagulopathy or on anticoagulation
- New onset of headache (< 3 months with no prior history of headache) with any ONE of the following:
 - Fever
 - Subacute head trauma
 - Acute, new, or fluctuating neurologic deficits, such as sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes or with signs of increased intracranial pressure (papilledema)
 - Migraine with atypical/complex aura (such as motor, brainstem or retinal auras which may be characterized by motor weakness, balance issues, vertigo, slurred speech, visional loss and/or double vision) ⁽³⁾
 - NOTE: Imaging is not indicated for typical migraine symptoms characterized by visual and/or sensory and/or speech/language symptoms AND the absence of motor, brainstem or retinal symptoms. Typical migraines develop gradually, last one hour or less and are completely reversible
 - Severe unilateral headache with radiation to or from the neck, associated with suspicion of carotid or vertebral artery dissection
 - History of cancer or significantly immunocompromised
 - Age $\geq$ 50 ^(4,5)
 - Related to activity or event (sexual activity, exertion, Valsalva, position), new or progressively worsening ⁽⁶⁾
 - Persistent or progressively worsening during a course of physician-directed treatment ⁽¹⁾
 - Pregnancy or postpartum ⁽⁷⁾
- Chronic headache (> 3 months) and a change in character/pattern (e.g., more frequent,

increased severity, or duration)

- Cluster headaches or other trigeminal-autonomic cephalalgias (paroxysmal hemicrania, hemicrania continua, short-lasting unilateral neuralgiform headache attacks (SUNCT/SUNA)) once to eliminate secondary causes

Additional Indications in the Pediatric Population (<18) When None of the Above Apply

- Persistent headache and any ONE of the following ^(8–10):
 - Immune deficiency
 - History of neoplasm
 - History of congenital heart disease
 - See **Imaging in Known Genetic Conditions** for additional indications
 - Coagulopathy
 - Occipital location
 - Age < 6 years
 - Documented absence of family history of headache
 - Concern for increased intracranial pressure with symptoms such as recurring headaches after waking

Neurological Symptoms or Deficits ^(11–15)

- Acute, new, fluctuating, or persistent neurologic symptoms or deficits such as, sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes

Stroke and Vascular Disease

Evaluation of Known or Suspected Stroke ^(16,17)

- Suspected stroke with any acute, new, or fluctuating symptoms or deficits such as sensory deficits, limb weakness, speech difficulties, visual loss, lack of coordination, or mental status changes
- History of stroke and ONE of the following:
 - No prior imaging
 - New neurologic signs or symptoms
- Suspected stroke with:
 - A personal or first-degree family history (brother, sister, parent, or child) of aneurysm
OR
 - Known coagulopathy or on anticoagulation

- Symptoms of transient ischemic attack (TIA) (episodic neurologic symptoms such as sensory deficits, limb weakness, speech difficulties, visual loss, lack of coordination, or mental status changes)
- See **Imaging in Known Genetic Conditions** section for additional indications (including for HbSS sickle cell disease or HbS β 0 thalassemia)

Evaluation of Known or Suspected Vascular Disease ⁽¹⁸⁾

- Evaluation of suspected acute subarachnoid hemorrhage (SAH)
- Follow-up for known hemorrhage, hematoma, or vascular abnormalities ⁽¹⁶⁾
- Suspected central venous thrombosis and ANY ONE of the following ⁽¹⁶⁾:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms.
- Click or tap here to enter text. Suspected cerebral cavernous malformations (CCM) and other low flow vascular malformations (such as dural venous anomalies (DVA) and capillary telangiectasias)
 - NOTE: High flow vascular malformations (such as AVM and dural AV fistulas) are imaged with angiography rather than MRI
- First-degree relatives of patients with more than one family member with a CCM should have a screening MRI as well as genetic counseling ^(19,20)
- Follow-up imaging of known CCM only to guide treatment decisions or to investigate new symptoms

Head Trauma

Evaluation of Known or Suspected Trauma ^(21–23)

- Known or suspected trauma or injury to the head with documentation of one or more of the following acute, new, or fluctuating:
 - Focal neurologic findings
 - Motor changes
 - Mental status changes
 - Amnesia
 - Vomiting

- Seizures
- Headache
- Signs of increased intracranial pressure
- Known coagulopathy or on anticoagulation
- Known or suspected skull fracture by physical exam and/or prior imaging
- Post concussive syndrome if persistent or disabling symptoms and MRI has not been performed
- Subacute or chronic traumatic brain injury with new cognitive and/or neurologic deficit

Pituitary Disorders

Suspected Pituitary Disorders ^(24–30)

- Neurologic deficit on exam suggestive of pituitary lesion (e.g., visual field deficit suggesting compression of the optic chiasm, diplopia, gaze palsy)
- Abnormal laboratory evaluations suggestive of a pituitary lesion with ONE or more of the following:
 - Panhypopituitarism: all pituitary hormones levels are low (GH, TSH, LH, FSH, ACTH, prolactin)
 - Growth hormone deficiency: low GH/IGF-1 (i.e. peak GL < 8 on stimulation)
 - NOTE: Imaging is not indicated for growth hormone supplementation for familial or idiopathic short stature in the absence of laboratory confirmed GH deficiency
 - Central hyperthyroidism: High/normal TSH AND high FT4
 - Central hypothyroidism: Low/normal TSH AND low FT4 AND normal prolactin
 - Cushing's Disease:
 - High cortisol and ACTH >20 OR
 - High cortisol and indeterminate ACTH (ACTH 5-20) with ACTH >5 on dexamethasone suppression test
 - Acromegaly: with high IGF-1 OR normal IGF1 but GH >1 on 2 hour oral glucose tolerance test
 - Central Diabetes Insipidus (arginine vasopressin deficiency): low ADH with testing indicating a central cause and not a peripheral cause, i.e., plasma copeptin, water restriction + desmopressin ⁽²⁵⁾
 - Central precocious puberty in a child (male ≤ 9; female ≤ 8), with high or normal LH/FSH and high mineralocorticoids, androgens and/or estrogens ⁽²⁵⁾
 - Hypogonadotropic hypogonadism [low sex hormones and gonadotropins (FSH/LH)] based on ONE of the following:
 - Persistently low total testosterone < 150 in the setting of low or normal LH/FSH

(i.e., severe secondary hypogonadism)

- Borderline low total testosterone levels (150-400 ng/dL) AND low or normal LH/FSH AND one of the following:
 - Neurological signs or symptoms
 - Other pituitary hormonal abnormalities
 - Low free testosterone and no clear clinical explanation (such as steroid use, obesity, eating disorder, excessive stress, etc.) is provided
- Prolonged amenorrhea (> 3 months if previously normal menses; > 6 months if previous irregular menses) AND persistently low estradiol (< 200 pmol/L) AND low/normal LH/FSH and no clear clinical explanation (such as steroid use, obesity, eating disorder, excessive stress, etc.) is provided ⁽³¹⁻³³⁾
- Prolactin < 250 ng/mL and ALL of the following ^(31,32):
 - Normal thyroid function tests
 - Normal renal function
 - Pregnancy is excluded (if applicable)
 - Not attributable to medication side effect
 - One of the following is present:
 - Prolactin $\geq$ 100 ng/mL
 - Persistently elevated prolactin (men > 20 ng/mL, non-pregnant females > 25 ng/mL)
 - Co-existent low testosterone/estrogen/progesterone AND low/normal LH/FSH
 - Neuroendocrine signs or symptoms (i.e., headache, galactorrhea, abnormal menses, infertility, or bitemporal hemianopsia)

NOTE: Galactorrhea without elevated prolactin (normoprolactinemic) is usually due to breast pathology and evaluated with breast imaging

Pituitary Adenoma (Known)

- New neuroendocrine signs or symptoms (such as headache, galactorrhea, abnormal menses, infertility, or bitemporal hemianopsia)
- < 10 mm non-functional asymptomatic adenoma (microadenoma)
 - 12 months after initial diagnosis then every 2 years
- $\geq$ 10 mm non-functional asymptomatic adenoma (macroadenoma) with ONE of the following:
 - Unresected: every 6 months
 - Resected: annually
- Functional adenoma with ONE of the following:

- To assess response to treatment
- Rising hormonal level
- 12 months after initiation of drug holiday
- Resected: 3-6 months post-operatively

Cystic Lesions

- Pineal cyst and ONE of the following:
 - Symptoms suggestive of change (e.g., headaches, gaze paresis, ataxia, papilledema, nausea/vomiting) ⁽³⁴⁾
 - Atypical features (multiloculated, enhancing, solid component):
 - Follow-up at 1, 3 and 5 years after diagnosis
 - Asymptomatic and age < 18:
 - Once 1-2 years after diagnosis (if stable, no further imaging)
- Rathke cleft cyst and ONE of the following ⁽³⁵⁾:
 - Symptoms suggestive of change (e.g., headaches, gaze paresis, ataxia, papilledema, nausea/vomiting)
 - Atypical imaging features (off midline, fluid-fluid septations)
 - Asymptomatic:
 - Unresected: At years 1, 3 and 5 (if stable, no further imaging)
 - Resected: Annually for 5 years (if stable, no further imaging)
- Arachnoid cyst and ONE of the following ^(36,37):
 - Surgical planning
 - Age < 4 years old
 - New symptoms suggestive of change (headaches, altered mental status, nausea/vomiting, seizures, visual/endocrine dysfunction)
- Midline dermoid cysts/sinuses with concern for intracranial extension ^(38,39)

Suspected Malignancy ^(40,41)

- Suspected brain tumor with any acute, new, or fluctuating neurologic symptoms or deficits such as sensory deficits, limb weakness, abnormal reflexes (pathological, asymmetric, hyperreflexia), speech difficulties, visual loss, lack of coordination, or mental status changes
- Lesion (including bone tumor/abnormality or soft tissue mass) on prior imaging ⁽⁴²⁾

Known Malignancy

Initial Staging and Recurrence

Indicated during the **initial diagnostic workup** for the following cancer types as routine imaging (regardless of symptoms):

- Adult and pediatric CNS tumors ⁽⁴⁰⁾
- Primary CNS lymphoma ⁽⁴⁰⁾
- Lung cancer (NSCLC and SCLC) ^(43,44)
- Melanoma
 - Primary mucosal tumor of the head and neck – any stage ⁽⁴⁵⁾
 - Stage III or IV for any primary site ⁽⁴⁶⁾
- Poorly differentiated neuroendocrine cancer ⁽²⁷⁾
- Gestational trophoblastic neoplasia with pulmonary metastases ⁽⁴⁷⁾
- Leukemia with suspicion of CNS involvement ^(48–50)
- Breast cancer stage IV ⁽⁵¹⁾
- Small cell neuroendocrine carcinoma of the cervix (NECC) ⁽⁵²⁾
- Histiocytic neoplasms (Langerhans cell histiocytosis, Rosai-Dorfman, Erdheim-Chester) ⁽⁵³⁾
- Any malignancy with signs or symptoms of brain metastases (e.g., headache, sensory deficits, memory problems), at any stage in treatment (initial, restaging, surveillance). There does not need to be a neurologic deficit on exam or other workup done first for a patient with known malignancy

Restaging

Indicated every 2-3 cycles of chemotherapy **during active treatment** for the following diseases:

- Adult and pediatric CNS tumors ⁽⁴⁰⁾
- Primary CNS lymphoma ⁽⁴⁰⁾
- Breast cancer, stage IV or any stage if suspected development of brain metastases ⁽⁵¹⁾
- Cutaneous melanoma, stage III or IV or any stage if suspected development of brain metastases ⁽⁴⁶⁾
- Non-small cell lung cancer ⁽⁴³⁾
 - Stage IV – every 2-3 cycles of treatment
 - All stages – end of treatment or with symptoms concern
- Small cell lung cancer ⁽⁴⁴⁾

- Poorly differentiated neuroendocrine cancer ⁽²⁷⁾
- Small cell neuroendocrine carcinoma of the cervix (NECC) ⁽⁵²⁾
- Histiocytic neoplasms (Langerhans cell histiocytosis, Rosai-Dorfman, Erdheim-Chester) ⁽⁵³⁾
- Any malignancy with signs or symptoms of brain metastases (e.g., headache, sensory deficits, memory problems), at any stage in treatment (initial, restaging, surveillance). There does not need to be a neurologic deficit on exam or other workup done first for a patient with known malignancy.
- Any malignancy with known CNS involvement

Surveillance

Routine, asymptomatic Brain MRI is appropriate during **surveillance** in the following diseases:

- Breast cancer stage IV ⁽⁵¹⁾
 - As clinically indicated
- Cutaneous melanoma stage III/IV ⁽⁴⁶⁾
 - Every 3 months for 2 years, then every 6-12 months indefinitely
- Non-small cell lung cancer ⁽⁴³⁾
 - Every 3-6 months for 3 years, then every 6 months for 2 years, then annually
 - If suspected development of brain metastases
- Small cell lung cancer ⁽⁴⁴⁾
 - Every 3-4 months during year 1, every 6 months during year 2, and as clinically indicated thereafter
- Neuroendocrine carcinoma of the cervix (interval at discretion of treating provider) ⁽⁵²⁾
- Adult and pediatric CNS tumors ⁽⁴⁰⁾
 - For histologies not specifically detailed below, every 3-6 months for 3-5 years then at least annually.
 - High grade glioma/Glioblastoma – 2-8 weeks after radiation therapy, then every 2-4 months for 3 years, then every 3-6 months indefinitely
 - Ependymoma – every 3-4 months for 1 year, every 4-6 months for 1 year, every 6-12 months for 5-10 years, then as clinically indicated
 - Medulloblastoma – every 3 months for 1 year, every 6-12 months for 5-10 years, then as clinically indicated.
 - Meningioma – every 2-4 months for 3 years then every 3-6 months indefinitely
- Primary CNS lymphoma every 3 months for 2 years, every 6 months for 3 years, then annually ⁽⁴⁰⁾

- Histiocytic neoplasms (Langerhans cell histiocytosis, Rosai-Dorfman, Erdheim-Chester) every 3-6 months for 2 years then no more than annually ⁽⁵³⁾

Seizure Disorders

Evaluation of Known or Suspected Seizure Disorder ^(54–60)

- New onset of an unprovoked seizure
- Newly identified change in seizure activity/pattern
- Known seizure disorder without previous imaging
- Medically refractory epilepsy
- New onset afebrile seizures in children except for benign epilepsy syndromes
- Complex febrile seizures in children accompanied by ANY of the following ^(54,56):
 - Abnormal neurologic exam
 - Autism, cerebral palsy or developmental delay (**see Background**)
 - Focal onset
 - Post-ictal Todd's paralysis (when a seizure is followed by a brief period of temporary paralysis)
 - Recurrent in 24 hours
 - Duration > 15 minutes
 - Abnormal EEG

Note: Advanced imaging is not indicated for simple pediatric febrile seizures

Note: Advanced imaging is not indicated for pediatric benign epilepsy syndromes/idiopathic focal or generalized epilepsy with typical features such as: Childhood absence epilepsy (JAE), Benign epilepsy with centrotemporal spikes (BECTS) also known as Benign Rolandic Epilepsy (BRE), Juvenile absence epilepsy (JAE), Juvenile myoclonic epilepsy (JME), benign epilepsy childhood with centrotemporal spikes (BECCT)

Multiple Sclerosis

Evaluation of Suspected Multiple Sclerosis ^(61,62)

- For evaluation of a patient with neurologic symptoms or deficits suspicious for MS with
 - A clinically isolated syndrome (optic neuritis, transverse myelitis, or brain stem syndrome); **OR**
 - Recurrent episodes of variable neurological signs or symptoms not attributable to another cause
- To demonstrate dissemination in time for diagnosis (every 6-12 months)

Evaluation of Known Multiple Sclerosis ^(62,63)

- To establish a new baseline (no recent imaging, postpartum))
- Prior to starting or switching disease-modifying therapy
- 3-6 months after starting/changing treatment
- Every 6-12 months until stable on disease-modifying treatment
- Once stable on disease-modifying treatment, every 1-2 years to assess for subclinical disease activity, less frequently when stable for 2-3 years
- 6-month repeat scan in patients with disease activity on MRI that is not associated with new clinical symptoms on a routine follow-up scan (i.e., Radiographically isolated syndrome)
- New signs or symptoms suggested of an exacerbation or unexpected clinical worsening
- In the pediatric population, increase frequency of imaging in children with highly active disease or in situations where imaging will change management
- Progressive Multifocal Leukoencephalopathy (PML) surveillance for MS patients on natalizumab (Tysabri) ⁽⁶⁴⁾
 - 12 months after the start of treatment in all patients
 - Further surveillance MRI scanning timing is based on risk of PML occurrence
 - Annually, if low risk (anti-JCV antibody negative)
 - Every 3-4 months, if high risk with ANY of the following:
 - seropositive for JC virus and have been treated with natalizumab for ≥18 months
 - high anti-JC virus antibody index values (>0.9)
 - previously treated with immunosuppressive therapies
 - Brain MRI every 3–4 months for up to 12 months, in high-risk patients who switch from natalizumab to other therapeutics

Infection and Inflammation

Evaluation of Known or Suspected Infection or Inflammatory Disease

- Suspected intracranial abscess or brain infection with acute altered mental status or with positive lab findings (such as elevated WBCs) **OR** follow-up assessment during or after treatment completed
- Meningitis with positive signs and symptoms (such as fever, headache, mental status changes, stiff neck) **OR** with positive lab findings (such as elevated white blood cells or abnormal lumbar puncture fluid exam) ^(65,66)
- Suspected encephalitis with headache and altered mental status or follow-up as clinically warranted

- Endocarditis with suspected septic emboli ⁽⁶⁷⁾
- Suspected Giant Cell (temporal arteritis) in a patient ≥ 50 with temporal headache, abrupt visual changes, jaw claudication, temporal artery tenderness, constitutional symptoms or elevated ESR ^(68–71); **AND**
 - Negative initial work-up (color Doppler ultrasonography or biopsy); **OR**
 - Atypical features, failure to respond to treatment or concern for intracranial involvement

Note: Protocol should include high-resolution contrast-enhanced imaging the temporal artery

- Vasculitis
 - Central Nervous System (CNS) involvement in patients with known or suspected vasculitis or autoimmune disease with abnormal inflammatory markers or autoimmune antibodies
 - Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ^(18,72,73)

Note: Vessel wall MRI (ordered as Brain MRI) can also be performed in the evaluation of vasculitides ⁽⁷⁴⁾

- Immunocompromised patient (e.g., transplant recipients, HIV with CD4<200, primary immunodeficiency syndromes, hematologic malignancies) with focal neurologic symptoms, headaches, behavioral, cognitive or personality changes
- Progressive Multifocal Leukoencephalopathy (PML) ^(75,76)
 - Suspected in an immunocompromised patient with one of the following:
 - Neurologic symptoms
 - Positive JC virus
 - Known PML follow up as clinically indicated
- Neurosarcoidosis ^(77,78)
 - Initial Evaluation:
 - Suspected based on neurological sign/symptoms and lab work (ACE, CSF analysis) **OR**
 - Known history of sarcoidosis with neurological signs or symptoms
 - Follow-up of known neurosarcoidosis:
 - To assess treatment response
 - Worsening signs or symptoms

Cognitive Impairment and Dementia

Evaluation of Cognitive Impairment ^(79–81)

- Evaluation for mild cognitive impairment or dementia with all of the following:
 - Objective measures demonstrate impairment (MMSE/MoCA < 26 or other mental status instruments (see **Background**) or mild cognitive impairment on neuropsychological testing)
 - Full lab evaluation (thyroid function tests, CBC, CMP, and B12) has been completed and if abnormal, has been treated and the cognitive difficulty persists

Treatment of Alzheimer's Disease ^(82,83)

- Baseline and surveillance imaging for anti-amyloid- β monoclonal antibody treatment as per FDA labeling

Movement Disorders ^(15,84–86)

Evaluation of Movement Disorders

- For evaluation of acute onset of a movement disorder with concern for stroke or hemorrhage
- For evaluation of suspected Parkinson's with atypical features or unresponsive to levodopa

Note: Atypical parkinsonian syndromes include progressive supranuclear palsy (PSP), multiple system atrophy (MSA), corticobasal degeneration (CBD), and dementia with Lewy bodies.

- For evaluation of new non-Parkinson neurological symptoms in known Parkinson's disease complicating the evaluation of the current condition
- For the evaluation of other movement disorders to exclude a structural lesion (i.e., suspected Huntington disease, chorea, hemiballismus, atypical dystonia)

Note: MRI not indicated in essential tremor, Tourette's syndrome, or isolated focal dystonia (e.g., blepharospasm, cervical dystonia, laryngeal dystonia, oromandibular dystonia, writer's dystonia) ^(86,87)

Cranial Nerve and Vision Abnormalities

Vision Abnormalities

For evaluation of cranial nerve and visual abnormalities

- Suspected Optic neuritis ⁽¹³⁾
- Abnormal eye findings on physical or neurologic examination that suggest CNS pathology (such as papilledema, pathologic nystagmus, optic atrophy, ocular nerve palsies, new onset anisocoria, visual field deficits)

NOTE: Advanced imaging is indicated for transient visual loss with a history consistent with transient ischemic attack (TIA) even if there is a normal exam at time of examination

- Binocular diplopia with concern for CNS pathology after comprehensive eye evaluation ⁽⁸⁸⁾

NOTE: Subjective symptoms such as blurred vision or double vision with no clear correlation on neurological examination requires a comprehensive eye evaluation to exclude more common causes, such as cataracts, refractive errors, retinopathy, glaucoma, or macular degeneration.

- Strabismus with neurological symptoms or signs, development delay, and/or an abnormal fundoscopic exam to rule out intracranial abnormalities ⁽⁸⁹⁾
- Horner's syndrome with signs/symptoms localizing the lesion to the brain (vertigo, altered facial sensation, contralateral CN IV palsy, crossed motor/sensory signs) ^(90,91)

Other Cranial Nerve Disorders ⁽⁹²⁾

- Advanced imaging for anosmia (CN I) (complete loss of smell), hyposmia (reduced sense of smell) or dysosmia (abnormal sense of smell) is indicated with ALL of the following ⁽⁹³⁾:
 - Persistent symptoms (generally considered to be 4 weeks or more)
 - Unknown origin (if related to rhinosinusitis, the indication for advanced imaging should meet the specific rhinosinusitis criteria)
 - Nasal endoscopy completed with indeterminate or abnormal findings OR nasal endoscopy documented as unavailable

NOTE: Advanced imaging for suspected olfactory disorders requires imaging the entire olfactory system. This can be accomplished with either an MRI of the Face or an MRI of the Brain depending on the institutional-specific MRI protocol.

- Trigeminal (CN V) neuralgia or neuropathy ⁽¹⁾
- Occipital Neuralgia with atypical features (such as burning versus stabbing pain, referred pain to the face/ear, tinnitus, visual disturbances) to exclude a structural lesion ⁽⁹⁴⁾
- Facial Nerve Paresis / Bell's Palsy (CN VII) with atypical features (such as bilateral involvement, multiple episodes, slow resolution beyond three weeks, incomplete/no improvement at three months, or facial twitching/spasms prior to onset) ^(92,95-97)
- Hemifacial spasm (CN VII)
- Clinical evidence of cranial nerve (CN IX, X, XI, and/or XII) deficits or dysfunction (such as dysphagia, shoulder/neck movement abnormalities, tongue movement abnormalities, vocal fold movement or sensation abnormalities) ⁽⁹²⁾
- Bulbar symptoms, (such as difficulty in chewing, dysarthria, dysphagia, and dysphonia) and/or bulbar signs (such as atrophy and fasciculations of the tongue, weakness of the facial muscles, palatal weakness, absent gag reflex) ⁽⁹²⁾
- Pseudobulbar symptoms (such as dysphagia, dysarthria, sudden stereotyped emotional

outbursts that are not reflective of mood) and/or pseudobulbar signs (such as spastic tongue, facial weakness, exaggerated gag/jaw jerk) ⁽⁹²⁾

Congenital Abnormalities

Evaluation of Known or Suspected Congenital Abnormalities

- Known or suspected congenital abnormality with any acute, new, or fluctuating neurologic, motor, or mental status changes
- Evaluation of macrocephaly in an infant/child <18 with previously abnormal US, abnormal neurodevelopmental examination, signs of increased ICP or closed anterior fontanelle ⁽⁹⁸⁾
- Evaluation of microcephaly in an infant/child < 18 ⁽⁹⁹⁾
- Evaluation of craniosynostosis and other skull deformities. CT is preferred imaging to assess bony structures; MRI imaging is preferred to assess intracranial soft tissue ⁽¹⁰⁰⁾
- Cerebral palsy and ONE of the following:
 - Etiology has not been established in the neonatal period
 - There is change in the expected clinical or developmental profile or concern for progressive neurological disorder (see **Background**) ⁽¹⁰¹⁾
- Prior treatment **OR** treatment planned for congenital abnormality

Note: For evaluation of known or suspected hydrocephalus please see section on CSF abnormalities, below.

Cerebrospinal Fluid (CSF) Abnormalities

Evaluation of Known or Suspected CSF Abnormalities

- Evaluation of suspected hydrocephalus with any acute, new, or fluctuating neurologic, motor, or mental status changes ⁽¹⁰²⁾
- Follow up of known hydrocephalus with new symptoms or to plan/monitor treatment ⁽¹⁰²⁾
- For initial evaluation of a suspected Arnold Chiari malformation ⁽¹⁰³⁾
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(103,104)
- Known syrinx or syringomyelia
- Known or suspected normal pressure hydrocephalus (NPH) ⁽¹⁰⁵⁾
 - With symptoms of gait difficulty, cognitive disturbance, and/or urinary incontinence
- Follow-up shunt evaluation and ONE of the following ⁽¹⁰²⁾:
 - Baseline imaging following placement or revision
 - 6-12 months after placement or revision

- Clinical concern for shunt malfunction
- Evaluation of known or suspected cerebrospinal fluid (CSF) leakage ⁽¹⁰⁶⁾
- Cisternography for intermittent and complex CSF rhinorrhea/otorrhea. CSF fluid should always be confirmed with laboratory testing (Beta-2 transferrin assay) ^(106,107)
- Suspected spontaneous intra-cranial hypotension with distinct postural headache (other symptoms include nausea, vomiting, dizziness, tinnitus, diplopia, neck pain or imbalance) ^(1,108)
- CSF flow study for evaluation and management of CSF flow disorders ^(109,110)

Other Indications

- Vertigo associated with any ONE of the following ^(14,111)
 - Signs or symptoms suggestive of a possible CNS lesion (such as a positive HINTS test, ataxia, dysarthria, visual loss, double vision, weakness, mental status change, hearing loss, tinnitus or a change in sensation)
 - Progressive unilateral/asymmetric hearing loss and/or tinnitus
 - Concern for stroke with known risk factors for cerebrovascular disease (such as hypertension, smoking, obesity, hypercholesterolemia)
 - Concern for central vertigo (source within the CNS) based on findings on neurologic examination and/or vestibular testing (such as skew deviation, vertical nystagmus, head thrust test, and/or videonystagmography (VNG) / electronystagmography (ENG) testing results suggesting a likely CNS etiology)

NOTE: “Vertigo” is the sensation that a person or their surroundings are moving. There are many vague, nonspecific terms that are often used instead including “dizzy”, “light-headed”, “woozy”, “groggy”, or “giddy”. The reviewer should examine the record to determine if the patient is experiencing vertigo or another condition (such as presyncope, ataxia, anxiety, arrhythmia). If it is not clear what condition is being described, clarification should be requested.

- Diagnosis of central sleep apnea on polysomnogram
 - Children > 1 year ⁽¹¹²⁾
 - Adults in the absence of heart failure, chronic opioid use, high altitude, or treatment emergent central sleep apnea **AND** concern for a central neurological cause (Chiari malformation, tumor, infectious/inflammatory disease) **OR** with an abnormal neurological exam ⁽¹¹³⁾
- Syncope with documented clinical concern for seizure or associated neurological signs or symptoms ⁽¹¹⁴⁾
- Cyclical vomiting syndrome or abdominal migraine with any localizing neurological symptoms ^(115,116)
- Psychological changes with neurological deficits on exam or after completion of a full neurological assessment that suggests a possible neurologic cause ⁽¹¹⁷⁾

- Child < 18 years with global developmental delay (see **Background**) OR a developmental delay with abnormal neurological examination or abnormal EEG ⁽¹¹⁸⁾

Note: MRI is not recommended as a part of routine evaluation in children with autism spectrum disorder and no other neurologic findings ⁽¹¹⁹⁾

- Unexplained event (BRUE) formerly apparent life-threatening event (ALTE) in infants < 1 year with concern for neurological cause based on history and exam ⁽¹²⁰⁾

Note: Imaging is not indicated in low-risk patients

- Bone Marrow Transplant (BMT) ⁽¹²¹⁾
 - For initial workup of BMT (along with CT Chest, CT Sinus and CT Abdomen and Pelvis)
- Opsoclonus-myoclonus-ataxia syndrome ⁽¹²²⁾
 - At diagnosis
 - As clinically indicated

MR Perfusion Imaging ^(123–125)

- Neurovascular disease
 - Assessment of ischemic penumbra in acute stroke
 - Assessment of cerebrovascular reserve
 - Further evaluation of known vascular abnormality (stenosis, malformation, vasospasm, vasculitis, Moya-Moya)
- Mass lesions
 - Differentiating tumor from tumor mimic
 - Differentiating glioblastoma from brain metastasis
 - Discriminating low- from high-grade gliomas
 - Differentiating recurrent brain tumors from radiation/chemo necrosis
 - Surgical planning

MRI Brain with Internal Auditory Canal (IAC)

(If only images of the IACs is needed without Brain imaging see Evolent Clinical Guideline 2048 for Sinus, Face, Orbit, Neck and Internal Auditory Canal MRI)

- Asymmetric/Unilateral sensorineural hearing loss documented on audiogram ⁽¹¹⁾
- Congenital hearing loss (unilateral or bilateral, conductive or sensorineural)

NOTE: "Congenital" refers to a condition, trait, or exposure that is present at birth that is due to genetic factors, non-genetic factors, or a combination of both. However, hearing loss can be mild initially and progress over time after birth, so the diagnosis of congenital hearing loss is not necessarily limited to young children only

- Pulsatile tinnitus (unilateral or bilateral) ⁽¹²⁶⁾
- Non-pulsatile, unilateral or asymmetric tinnitus
- Suspected auditory neuropathy
- Suspected acoustic neuroma (Schwannoma) or cerebellar pontine angle tumor based on clinical signs and symptoms (such as unilateral/asymmetric sensorineural loss, vertigo, disturbed balance or gait, unilateral/asymmetric tinnitus, facial weakness, or altered sense of taste) ⁽¹²⁷⁾
- Advanced imaging is indicated for peripheral vertigo (source within the temporal bone) with ALL of the following:
 - Clinical evidence of a peripheral source of vertigo (such as head-Impulse with saccade, spontaneous unidirectional horizontal nystagmus, positive Dix-Hallpike maneuver, Electronystagmography (ENG) testing and/or rotary chair testing indicating peripheral vertigo)
 - Persistent symptoms after a trial of pharmacotherapy (such as meclizine, diazepam) AND four weeks or more of vestibular therapy (such as Epley's maneuvers, vestibular rehabilitation)
- Suspected necrotizing otitis externa (formally known as malignant otitis externa) particularly in high-risk populations (such as immunocompromised, poorly controlled diabetes, prior radiation therapy) ⁽¹²⁸⁾
- Clinical suspicion of a complication of acute otitis media including any ONE of the following ^(129,130):
 - Systemic illness or toxic appearance
 - Signs/symptoms of possible intracranial complications (such as headache, tinnitus, vertigo, nystagmus)
- Known OR suspected cholesteatoma (abnormal growth of epithelial tissue within the middle ear) ⁽¹³¹⁾
- Suspected glomus tumor
- MRI IAC imaging for possible CSF otorrhea (or secondary CSF rhinorrhea via the eustachian tube) is indicated with any ONE of the following ^(107,132):
 - High index of suspicion of CSF leak based on clinical evidence (such as persistent leaking, worse leaking with provocative maneuvers (Valsalva), positive Beta-2 transferrin assay of the leakage)
 - Prior imaging (such as CT, nuclear medicine imaging) suggesting bony defect/lesion contributing to suspected/known CSF leak
- Facial Nerve Paresis / Bell's Palsy (CN VII) with atypical features (such as bilateral involvement, multiple episodes, slow resolution beyond three weeks, incomplete/no improvement at three months, or facial twitching/spasms prior to onset) ^(95,96)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS ON PRIOR IMAGING

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Achondroplasia ⁽¹³³⁾:
 - Once (to evaluate the corticomedullary junction; typically done in infancy)
- Beckwith-Wiedemann syndrome ⁽¹³⁴⁾:
 - At diagnosis if significant developmental delay is present
- Constitutional mismatch repair deficiency syndrome (CMMRD) ⁽¹³⁵⁾:
 - Every 6 months
- Fabrys Disease ⁽¹³⁶⁾:
 - Every 2 years (including at diagnosis) starting at age 18 OR
 - More frequently if symptomatic
- FAP (Familial Adenomatous Polyposis) ⁽¹³⁷⁾:
 - As clinically indicated
- Hemochromatosis ⁽¹³⁸⁾:

- As clinically indicated
- Heritable Retinoblastoma (RB1) ^(139,140):
 - Every 6 months
- Li Fraumeni (TP53) ^(141,142):
 - Annually
- LZTR1-related Schwannomatosis ⁽¹⁴³⁾:
 - Every 2 years starting at age 12
- Multiple Endocrine Neoplasia type 1 (MEN1) ^(27,144):
 - Every 3 years starting at age 5
- Neurofibromatosis 1 (NF1) ^(145,146):
 - New subjective or objective neurologic or cognitive concerns (including vision changes, growth changes, TIA or headaches)
- NF2-Related Schwannomatosis ⁽¹⁴⁷⁾:
 - Annually beginning at age 10
- Capillary Malformation-Arteriovenous Malformation Syndrome (e.g., Sturge Weber Syndrome) ⁽¹⁴⁸⁾:
 - Once at diagnosis
 - Repeat imaging only if symptomatic
- Sickle Cell Disease ^(149,150):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s
 - New neurologic or cognitive concerns (including TIA, no formal testing required)
 - When cessation or changing frequency of transfusions is under consideration
- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(143,151):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5
- Tuberous Sclerosis ⁽¹⁵²⁾:
 - Annually
- Von Hippel-Lindau (VHL) ⁽¹⁵³⁾:

- At diagnosis (including IAC) then annually starting at age 11
- X-linked Adrenoleukodystrophy ⁽¹⁵⁴⁾:
 - Every 6 months until age 12
 - Annually after age 12
- For other genetic syndromes not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Imaging in Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Brain MRI and Brain MRA

- Fabrys Disease ⁽¹³⁶⁾:
 - Every 2 years (including at diagnosis) starting at age 18 OR
 - More frequently if symptomatic
- Sickle Cell Disease ^(149,150):
 - When needed to screen for silent stroke
 - Abnormal Transcranial Doppler Velocity > 200 cm/s
 - New neurologic or cognitive concerns (including TIA, no formal testing required)
 - When cessation or changing frequency of transfusions is under consideration

Brain/Breast/Whole Body MRI

- Li-Fraumeni (TP53) ⁽¹⁴²⁾:
 - Annually
 - NOTE: Can include Abdomen MRI if meets family history requirement. Additional imaging may be needed based on patient-specific factors

Chest CT and Brain/Abdomen/Pelvis MRI

- Multiple Endocrine Neoplasia type 1 (MEN1) ^(27,144):
 - Annually starting at age 8
 - NOTE: Every 3 years include Brain MRI

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- LZTR1-related Schwannomatosis ⁽¹⁴³⁾:

- Every 2 years starting at age 12
- Neurofibromatosis 1 (NF1) ^(145,146):
 - Signs and symptoms concerning for brain or spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Whole Body MRI

- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(143,151):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Abdomen MRI

- Von Hippel-Lindau (VHL) ⁽¹⁵³⁾:
 - Annually (including at diagnosis) starting at age 11

OTHER COMBINATION STUDIES WITH BRAIN MRI

These body regions might be evaluated separately or in combination as documented in the clinical notes by physical examination findings (e.g., localization to a particular segment of the neuroaxis), patient history, and other available information, including prior imaging.

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Brain MRI and Brain MRA

- Recent ischemic stroke or transient ischemic attack (TIA) ^(16,155)
- Thunderclap headache with continued concern for underlying vascular abnormality (i.e., aneurysm or reversible cerebral vasoconstriction syndrome) after initial negative brain imaging ^(1,2,8,156)
 - **Note:** Negative brain CT < 6 hours after headache onset excludes subarachnoid hemorrhage in neurologically intact patients. ⁽¹⁵⁶⁾ MRI lacks sensitivity in excluding subarachnoid hemorrhage less than 24 hours after headache onset. ^(2,157)
- Acute, sudden onset of headache with personal history of a vascular abnormality or first-degree family history of aneurysm ^(1,18)
- Headache associated with exercise, exertion, or sexual activity ⁽²⁾

- Suspected central venous thrombosis and ANY ONE of the following ⁽¹⁶⁾:
 - Patient has a hypercoagulable state such as pregnancy, post-partum, prothrombotic conditions (acquired or genetic), malignancy, oral contraceptive use, recent infection, recent trauma or Covid-19
 - Documentation of concern for central venous thrombosis is specified
 - Papilledema or signs/symptoms of increased intracranial pressure
- See **Imaging in Known Genetic Conditions** for additional indications
- Known Moyamoya disease ^(17,158) or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms ^(1,159)
- Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies ⁽¹⁸⁾
- Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ^(18,73,160)
- Giant cell arteritis with suspected intracranial involvement ^(68,70)

Brain MRI and Brain/Neck MRA ^(16,17)

- Recent ischemic stroke or transient ischemic attack (TIA) ^(16,155)
- History of stroke and **ONE** of the following:
 - No prior workup
 - New neurologic signs or symptoms
- Suspected carotid or vertebral artery dissection with focal or lateralizing neurological deficits
- Pulsatile tinnitus with concern for a suspected arterial vascular and/or intracranial etiology ^(127,161,162)
 - **NOTE:** For the indication of pulsatile tinnitus the Brain MRI of the combination should include the Internal Auditory Canal (IAC)
- Giant cell arteritis with suspected intracranial and extracranial involvement ⁽⁶⁹⁾

Note: CTA and MRA are generally comparable noninvasive imaging alternatives, each with their own advantages and disadvantages. Brain MRI can be combined with Brain CTA/Neck CTA

Brain/Cervical Spine MRI

- Horner's syndrome with symptoms localizing the lesion to the brain and cervical spine (vertigo, altered facial sensation, contralateral CN IV palsy, crossed motor/sensory signs, radicular signs) ^(91,163)

Brain/Cervical Spine/Thoracic Spine MRI

- Combination studies for MS: These body regions might be evaluated separately or in combination as guided by physical examination findings (e.g., localization to a particular segment of the spinal cord), patient history (e.g., symptom(s), time course, and where in the CNS the likely localization(s) is/are), and other available information, including prior imaging.
 - For evaluation of neuromyelitis optica spectrum disorders (recurrent or bilateral optic neuritis; recurrent transverse myelitis) ⁽¹³⁾
 - For known MS, prior to the initiation or change of disease modification treatments and assess disease burden (to establish a new baseline) ^(62,164)
 - Follow-up scans, including brain and spine imaging, if patients have known spine disease ⁽⁶²⁾:
 - 3-6 months after starting/changing treatment
 - Every 6-12 months until stable on disease modifying therapy
 - Once stable on disease modifying treatment, every 1-2 years to assess for subclinical disease activity, less frequently when stable for 2-3 years.

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(103,109,165,166)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽⁴⁰⁾
 - Drop metastasis from brain or spine
 - Suspected leptomeningeal carcinomatosis ⁽¹⁶⁷⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous (idiopathic) intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁶⁸⁾
- Tumor evaluation and monitoring in cancer predisposition syndromes

Brain/Face/Sinus MRI

- Granulomatosis with polyangiitis (Wegener's granulomatosis) disease ⁽¹⁶⁹⁾
- Trigeminal neuralgia or neuropathy with an atypical presentation (for evaluation of the extracranial nerve course) ⁽⁹²⁾
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent

intracranial pathology ⁽¹⁷⁰⁾

Brain/Orbit MRI

- Optic neuropathy or unilateral optic disk swelling of unclear etiology to distinguish between a compressive lesion of the optic nerve, optic neuritis, ischemic optic neuropathy (arteritic or non-arteritic), central retinal vein occlusion or optic nerve infiltrative disorders ^(13,171)
- Bilateral optic disk swelling (papilledema) with visual loss ⁽¹³⁾
- Optic neuritis
 - If atypical presentation (bilateral, absence of pain, optic nerve hemorrhages, severe visual impairment, lack of response to steroids, poor recovery or recurrence) ^(13,172)
 - If needed to confirm optic neuritis and rule out compressive lesions
- Known or suspected neuromyelitis optica spectrum disorder with severe, recurrent, or bilateral optic neuritis ⁽¹³⁾
- Suspected retinoblastoma ⁽¹³⁾
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent intracranial pathology ⁽¹⁷⁰⁾

Neck/Brain MRI

- Objective cranial nerve palsy (CN IX-XII) (for evaluation of the extracranial nerve course) ⁽⁹²⁾
- Bell's Palsy/hemifacial spasm that meets the above criteria ⁽⁹²⁾
- For approved indications as noted above and being performed in a child under 8 years of age who will need anesthesia for the procedure and there is a suspicion of concurrent intracranial pathology ⁽¹⁷⁰⁾

Sinus/Chest/Abdomen and Pelvis CT and Brain MRI

- Prior to Bone Marrow Transplantation

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

70551, 70552, 70553, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

Computed Tomography (CT) versus Magnetic Resonance Imaging (MRI)

Generally, magnetic resonance imaging is the preferred imaging technique for evaluating the brain parenchyma, and CT is preferable for evaluating subarachnoid hemorrhage. CT is faster and more readily available than MRI and is often used in urgent clinical situations.

Memory Status Instruments

Cut off values for cognitive impairment

Mini-Cog < 3

Memory Impairment Screen < 5

Saint Louis University Mental Status Examination (SLUMS)

- High school education <27
- Less than high school education <25

Brief Alzheimer's Screen (BAS) <24

Blessed Dementia Scale (BDS) >3

Clinical Dementia Rating

- Sum of boxes score > or equal to 4.5 or
- Global score greater than or equal to 1

Montreal Cognitive Assessment (MoCA) < 26

Mini-Mental Status Exam (MMSE) < 26

Table 1: Gait and Brain Imaging (173–176)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines
Sensory ataxic	Cautious, stomping, worsening without visual input (i.e., + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG, if there is foot drop, Lumbar spine MRI Pelvis MR appropriate evidence of

Gait	Characteristic	Work up/Imaging
		plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI as per GL

Non-neurological causes of gait dysfunction include pain (antalgic), side effects of drugs (analgesic, antihistamines, benzos, psych meds, antihypertensives), visual loss, hearing impairment, orthopedic disorders, rheumatologic disorders, psychogenic, and cardiorespiratory problems (orthostasis). ^(173–176)

MRI and developmental delay

Significant developmental delay is defined as significant delay (more than two standard deviations below the mean) in one or more developmental domains: gross/fine motor, speech/language, cognition, social/personal, and activities of daily living. Isolated delay in social/language development is characteristic of autism spectrum disorders or hearing loss. Isolated delay in motor development is characteristic of cerebral palsy (a static encephalopathy) or myopathy. Global developmental delay (GDD) is a subset of developmental delay defined as significant delay (by at least 2 SD's) in two or more developmental categories. Note that the term "GDD" is usually reserved for children <5 years old, whereas in older children >5 years, disability is quantifiable with IQ testing.

Low risk brief resolved unexplained event (BRUE) formerly apparent life-threatening event (ALTE) requires all the following:

- Age > 60 days
- Gestational age $\geq$ 32 weeks or older and corrected gestational age $\geq$ 45 weeks
- First brief event
- Event lasting < 1 minute
- No CPR required by the trained medical provider
- No concerning historical features or physical examination findings

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Cerebrovascular Diseases-Aneurysm, Vascular Malformation, and Subarachnoid Hemorrhage ⁽¹⁸⁾

Study Design: The study design involves a detailed literature review and expert panel recommendations to establish imaging guidelines for various cerebrovascular conditions. The criteria are based on the latest evidence and expert consensus to ensure appropriate imaging procedures are selected for different clinical scenarios.

Target Population: The target population includes patients with cerebrovascular diseases such as aneurysms, vascular malformations, and SAH. Specific variants address different clinical

presentations, including known acute SAH, suspected cerebral vasospasm, untreated cerebral aneurysms, previously treated cerebral aneurysms, high-risk cerebral aneurysm screening, known high-flow vascular malformations, and suspected CNS vasculitis.

Key Factors:

Imaging Recommendations: The document outlines the appropriateness of various imaging modalities, including arteriography, CTA, MRA, MRI, and ultrasound, for different clinical scenarios. Each variant provides specific recommendations based on the clinical presentation and the relative radiation level associated with each imaging procedure.

Clinical Presentations: The criteria cover a wide range of clinical presentations, from acute SAH to surveillance monitoring of untreated and treated aneurysms, as well as screening for high-risk populations and evaluation of suspected CNS vasculitis.

Expert Panel: The recommendations are developed by an expert panel on neurological imaging, including specialists from various institutions and organizations. The panel's collaboration ensures a comprehensive and well-rounded approach to imaging guidelines.

Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition ⁽²⁾

Study Design: The ICHD-3 is a systematic classification of headache disorders based on extensive research and clinical studies. The classification is hierarchical, allowing for detailed diagnosis from the first-digit level to the fifth. The criteria for each headache type are based on clinical features, diagnostic criteria, and evidence from field-testing studies.

Target Population: The target population includes individuals experiencing various types of headaches, ranging from primary headaches like migraines and tension-type headaches to secondary headaches attributed to other disorders. The classification is intended for use by healthcare professionals, including neurologists, general practitioners, and researchers, to diagnose and manage headache disorders.

Key Factors:

Primary Headaches: The document classifies primary headaches into categories such as migraines, tension-type headaches, and trigeminal autonomic cephalalgias. Each category includes specific diagnostic criteria, clinical features, and comments on pathophysiology and treatment.

Secondary Headaches: These are headaches attributed to other disorders, such as trauma, vascular disorders, infections, and psychiatric disorders. The classification provides criteria for diagnosing secondary headaches based on the temporal relationship between the headache and the underlying disorder.

Diagnostic Criteria: The criteria for each headache type include the number of attacks, duration, pain characteristics, associated symptoms, and exclusion of other diagnoses. For example, migraine without aura requires at least five attacks lasting 4-72 hours with specific pain characteristics and associated symptoms like nausea and photophobia.

Field Testing: The classification includes results from field-testing studies that validate the diagnostic criteria. These studies involve large populations and use advanced diagnostic methods like neuroimaging and genetic testing.

Clinical and Research Applications: The ICHD-3 is designed for both clinical practice and research. It helps clinicians diagnose and manage headache disorders and provides a standardized framework for researchers to study headache epidemiology, pathophysiology, and treatment.

ACR Appropriateness Criteria® Cerebrovascular Diseases-Stroke and Stroke-Related Conditions⁽¹⁶⁾

Study Design: The document is a guideline developed by the American College of Radiology (ACR) Appropriateness Criteria Expert Panel on Neurological Imaging. It is based on a systematic analysis of medical literature from peer-reviewed journals and follows established methodology principles such as the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) and the RAND/UCLA Appropriateness Method.

Target Population: The guidelines are intended for use by radiologists, radiation oncologists, and referring physicians in making decisions regarding radiologic imaging and treatment for patients with cerebrovascular diseases, including stroke and stroke-related conditions.

Key Factors:

Conditions Covered: The guidelines encompass a wide range of cerebrovascular diseases, including carotid stenosis, carotid dissection, intracranial large vessel occlusion, and cerebral venous sinus thrombosis. They also address complications such as intraparenchymal hemorrhage and completed ischemic strokes.

Imaging Recommendations: The document provides evidence-based guidelines for appropriate imaging examinations for diagnosis and treatment of specified medical conditions. It includes recommendations for various imaging modalities such as CT, MRI, MRA, and ultrasound.

Clinical Scenarios: The guidelines cover different clinical scenarios, including transient ischemic attack (TIA), acute ischemic stroke, recent ischemic infarct, and known intraparenchymal hemorrhage, among others.

Methodology: The guideline development and revision process involves a multidisciplinary expert panel and supports the systematic analysis of medical literature. In instances where peer-reviewed literature is lacking or equivocal, expert opinions are used to formulate recommendations.

ANALYSIS OF EVIDENCE

Shared Conclusions^(2,16,18):

1. **Diagnostic Imaging:** All three articles emphasize the importance of diagnostic imaging in identifying and managing cerebrovascular conditions. They discuss various imaging

modalities such as CT, MRI, MRA, and CTA, highlighting their roles in diagnosing conditions like stroke, aneurysms, and vascular malformations.

2. **Clinical Guidelines:** The articles provide clinical guidelines for the management of cerebrovascular diseases. They stress the need for evidence-based approaches and the use of standardized criteria to ensure accurate diagnosis and effective treatment.
3. **Risk Factors:** Each article discusses the risk factors associated with cerebrovascular diseases, including hypertension, smoking, and genetic predispositions. They highlight the importance of identifying these risk factors to prevent and manage conditions effectively.

POLICY HISTORY

Date	Summary
July 2025	● Edited the policy history for June 2025 to better reflect the changes that were presented at committee. No clinical changes
June 2025	● Guideline name changed from Brain MRI to Brain Magnetic Resonance Imaging (MRI) With or Without Internal Auditory Canal (IAC) Views ● Guideline number changed from 001 to 2012 ● Added new bullet-point to the General Statement section ● Updated Imaging in Known Genetic Conditions section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references ● Updated background ● Updated combination section ● Updated cancer section ● Reorganized pediatric headache section ● Reorganized pituitary section ○ Clarified labs ○ Added amenorrhea section ○ Updated adenoma section ● Updated IAC section

Date	Summary
	○ Clarified congenital hearing loss ○ Added peripheral vertigo ○ Added Necrotizing otitis externa Clarified: ● Acute and chronic headache timeframes ● Migraine aura ● Central venous thrombosis ● Low and high flow vascular malformations ● Pediatric seizures ● Clarified follow up scan follow up time frames ● Clarified JC virus status and progressive multifocal leukoencephalopathy (PML) ● Cognitive impairment labs ● Horner's syndrome ● Visual symptoms ● Cranial neuropathies ● Follow up of known hydrocephalus ● Follow-up shunt evaluation ● Vertigo Added: ● History of stroke ● Genetic section ● Cystic lesion section (clarified timeframes) ● Added anosmia back in with conditions
June 2024	● <u>Changes</u> ○ Updated references ○ Updated background section ○ Updated combination section ● <u>Added</u> ○ Genetic syndromes and rare disease section- reorganized

Date	Summary
	indications ○ Note: Vessel wall MRI (ordered as Brain MRI) can also be performed in the evaluation of vasculitides ○ PML suspected or known to the infectious or inflammatory disease section. ○ And updated Brain MRI for Known Cancer sections (initial staging, restaging and surveillance) ○ Vertigo with progressive unilateral hearing loss or tinnitus ○ Horner's syndrome with symptoms localizing the lesion to the central nervous system (Brain/Cervical MRI Combo) ○ Known Moyamoya disease or reversible cerebral vasoconstriction with any new or changing neurological signs or symptoms (also to (Brain MRA /MRI combo) ○ Suspected secondary CNS vasculitis based on neurological signs or symptoms in the setting of an underlying systemic disease with abnormal inflammatory markers or autoimmune antibodies (Brain MRA /MRI combo) ○ Suspected primary CNS vasculitis based on neurological signs and symptoms with completed infectious/inflammatory lab work-up ((Brain MRA /MRI combo)) ○ Giant cell arteritis with suspected intracranial and extracranial involvement (Brain MRA /Neck/ Brain MRI combo)) ● <u>Clarified</u> ○ Updated pediatric seizure section. ○ Treatment of Alzheimer's disease with anti-amyloid-β monoclonal antibodies - baseline and surveillance imaging as per FDA labeling ● <u>Deleted</u> ○ Aduhelm monitoring ○ MRI Brain with IAC/MRA Head/MRA Neck section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2028 for Functional Magnetic Resonance Imaging (MRI) Brain

Guideline Number: Evolent_CG_2028	<u>Applicable Codes</u>	
<i>"Evolent" refers to Evolent Health LLC and Evolent Specialty Services, Inc.</i> <i>© 2007 - 2026 Evolent. All rights Reserved.</i>		
Original Date: June 2007	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

fMRI

Functional MRI (fMRI) of the brain is a non-invasive imaging technique, to image the brain activity of a patient prior to undergoing brain surgery. fMRI images capture blood oxygen levels in parts of the brain that are responsible for perception, cognition, and movement allowing neurosurgeons to operate with less possibility of harming areas that are critical to the patient's quality of life. fMRI is primarily used for presurgical planning, operative risk assessment and therapeutic follow-up.

See Legislative Language section for legislation for the State of Washington.

INDICATIONS FOR FUNCTIONAL BRAIN MRI ^(1,2)

Pre-Operative/Procedural Evaluation ⁽¹⁾

fMRI may have a significant role in the mapping of a lesion in relation to eloquent cortex (i.e., language, motor, sensory and visual centers) to determine the appropriateness of surgical intervention in the following:

- Focal brain lesion (i.e., tumor or vascular malformation) for presurgical planning ⁽³⁻⁶⁾
- Pre-operative evaluation for epilepsy surgery ^(7,8)
- Brain tumor for radiation treatment planning ^(9,10)



Post-Operative/Procedural Evaluation

Therapeutic follow-up: A documented medical reason must clearly explain the medical necessity for follow up (i.e., evaluation of post-treatment eloquent cortex).

LEGISLATIVE LANGUAGE

State of Washington

WSHCA 20150116A ⁽¹¹⁾

Number and Coverage Topic:

20150116A – **Functional Neuroimaging for Primary Degenerative Dementia or Mild Cognitive Impairment***

HTCC Coverage Determination:

Functional neuroimaging for primary degenerative dementia or mild cognitive impairment is **not covered**.

HTCC Reimbursement Determination:

Limitations of Coverage: N/A

Non-covered Indicators:

Functional imaging technologies including: fludeoxyglucose (FDG) Positron Emission Tomography (PET), (11)C-dihydrotetrabenazine (C-DTBZ) PET, Single Photon Emission Computed Tomography (SPECT), Functional Magnetic Resonance Imaging (fMRI) for the diagnosis of primary degenerative dementia or mild cognitive impairment.

* Beta-amyloid PET imaging is outside the scope of this coverage determination.

CODING AND STANDARDS

Codes

70554, 70555



Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Task vs. Resting State fMRI

During resting-state fMRI (rs-fMRI), unlike task-based functional MRI, the individual is not required to perform any specific task ^(12–14). This is beneficial for patients who have difficulty performing tasks, such as pediatric and certain neurologic or psychiatric patients. This technique has been well-utilized in research, and its clinical use is increasing considerably, especially in presurgical planning (e.g., mapping epileptic foci) and neuropsychiatric diseases. For the above indications, non-tasked based fMRI such as resting state fMRI can also be performed.

fMRI and Brain Tumors

fMRI is often used before surgery in the evaluation of patients with brain tumors. fMRI may have a significant role in mapping lesions that are located in close proximity to vital areas of brain function (language, sensorimotor, and visual). It can determine the precise spatial relationship between the lesion and adjacent functionally essential parenchyma, allowing removal of as much pathological tissue as possible during resection of brain tumors without compromising essential brain functions. fMRI provides an alternative to other invasive tests, such as the Wada test and direct electrical stimulation. ⁽¹⁵⁾

fMRI and Seizures

Brain fMRI

Brain surgery is often the treatment for patients with refractory epilepsy, especially patients with a single seizure focus. fMRI can be used to image and localize abnormal brain function in patients with seizures and help determine brain functions (language, sensorimotor, and visual) of areas bordering the lesion, resulting in better outcomes with less neurologic deficit. ⁽¹⁶⁾ fMRI is

increasingly being used to evaluate candidates for surgical treatment of intractable epilepsy (Phase 1 evaluation) to see if they are an appropriate candidate.

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

Current State of Functional MRI in the Presurgical Planning of Brain Tumors ⁽⁵⁾

- **Study Design:** This review article discusses the current state of functional MRI (fMRI) for preoperative assessment in patients undergoing brain tumor resection.
- **Target Population:** The study focuses on patients with malignant primary brain tumors, particularly astrocytomas, which commonly occur in the frontal, temporal, and parietal lobes.
- **Key Factors:** The article highlights the use of fMRI for noninvasive preoperative mapping of brain function, emphasizing its advantages over direct cortical stimulation (DCS). It discusses task-based fMRI (tb-fMRI) and resting-state fMRI (rs-fMRI), noting the challenges and limitations of each technique. The review also addresses the impact of fMRI on surgical planning, extent of resection, and functional outcomes, while acknowledging the limited evidence supporting its impact on survival and functional outcomes.

Integration of BOLD-fMRI and DTI into radiation treatment planning for high-grade gliomas located near the primary motor cortexes and corticospinal tracts ⁽¹⁰⁾

- **Study Design:** This research article evaluates the efficacy of integrating blood oxygen level dependent functional magnetic resonance imaging (BOLD-fMRI) and diffusion tensor imaging (DTI) data into radiation treatment planning for high-grade gliomas located near the primary motor cortexes (PMCs) and corticospinal tracts (CSTs).
- **Target Population:** The study includes 20 patients with high-grade gliomas adjacent to PMCs and CSTs, recruited between 2012 and 2014.
- **Key Factors:** The article discusses the integration of BOLD-fMRI and DTI into radiation treatment planning, comparing different treatment plans (3DCRT, IMRT, and IMRT_PMC&CST). The findings indicate that integrating BOLD-fMRI and DTI is feasible

and beneficial, as it helps to spare critical brain structures during treatment without compromising target volume coverage.

Neurological update: structural and functional imaging in epilepsy surgery ⁽⁸⁾

- **Study Design:** This neurological update reviews the role of structural and functional imaging in epilepsy surgery, focusing on techniques such as computed tomography (CT), magnetic resonance imaging (MRI), functional MRI (fMRI), single photon emission computed tomography (SPECT), and positron emission tomography (PET).
- **Target Population:** The review targets patients with medically refractory epilepsy who are potential candidates for resective surgery.
- **Key Factors:** The article highlights the importance of fMRI in localizing eloquent brain areas, such as language and motor cortices, to minimize postoperative deficits. It discusses the advantages of fMRI over invasive techniques like direct cortical stimulation (DCS) and the Wada test. The review also addresses the use of PET and SPECT in identifying the epileptogenic zone and guiding surgical planning.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(5,8,10):

- All three studies emphasize the importance of advanced imaging techniques, such as fMRI, in preoperative assessment and treatment planning for brain conditions.
- They highlight the noninvasive nature of fMRI and its role in improving surgical planning and minimizing functional deficits.
- The studies underscore the need for accurate and timely diagnosis to facilitate appropriate treatment and improve patient outcomes.

Summary ^(5,8,10):

In summary, these articles collectively provide valuable insights into the use of fMRI for preoperative assessment and treatment planning in patients with brain tumors and epilepsy. They highlight both the shared importance of advanced imaging techniques and the unique contributions of each study to the understanding of functional brain MRI.



POLICY HISTORY

Date	Summary
June 2025	• Updated background and references • This guideline replaces Evolent Clinical Guideline 013 for Functional Brain MRI • Guideline name changed to Functional MRI Brain • Added third bullet to General Information • Added Summary of Evidence and Analysis of Evidence • Checked Medicare Advantage Line of Business
July 2024	• Updated background and references • Contraindications and preferred studies section added to the background • Added legislative language for Washington

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or



regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2018 for Chest Computed Tomography (CT)

Guideline Number: Evolent_CG_2018	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Chest Computed Tomography (CT) generates images of the organs and structures in the chest (thorax) with the use of radiation.

INDICATIONS FOR CHEST CT

Follow-Up of Lung Nodules

NOTE: LUNG-RADS table is used to follow-up on lung nodules on low dose CT (LDCT) that will be followed up with a low dose CT. The Fleischner table is used to follow-up on incidental lung nodules seen on studies other than a low dose CT (such as Chest x-ray or Chest CT). If multiple nodules, the largest and most concerning is used for the decision.

Lung Nodules with no history of malignancy ^(1,2)

- Incidental pulmonary nodule on x-ray:
 - Immediate follow up with Chest CT if the nodule is indeterminate as per the radiology report (i.e., not typical of granulomatous disease)
- Incidental pulmonary nodules on non-chest CT (such as a neck, shoulder or abdomen CT):
 - Nodules > 8 mm or those with very suspicious features need a dedicated Chest CT as early as possible
 - Nodules ≤ 8 mm should follow the Fleischner table (see **Table 2**) to determine when a dedicated Chest CT is needed
- Follow-up of pulmonary nodules detected on a non-screening (regular) Chest CT is as

per Fleischner table (see **Table 2**) when **ALL** of the following criteria are met:

- Individual is ≥ 35 years old
 - If age is < 35, non-malignant causes are more likely, and infection should be excluded. Once infection is excluded if the nodule is unable to be followed with chest x-ray and explanation given as to how management would change, coverage can be considered on a case-by-case basis
- No personal history of cancer
 - If there is a prior history of cancer, follow-up imaging can be done as soon as 3 months
- No immunocompromise
 - If the patient is immunocompromised, follow-up imaging can be done as soon as 1 month if there is suspicion of fulminant infection

Follow-up of Lung Nodule seen on Screening LDCT

Follow-up of pulmonary nodule identified on screening LDCT (for patients at high risk for lung cancer) as per Lung-RADS criteria ⁽³⁾ (see **Table 1** - typically ordered as a LDCT)

Infection and Inflammation

Infection Follow-up Imaging

- Recent pneumonia and suspected parapneumonic effusion or empyema after recent chest x-ray ⁽⁴⁾
- For evaluation of non-resolving pneumonia or inflammatory disease documented by **at least two** imaging studies:
 - Unimproved with 4 weeks of antibiotic treatment; **OR**
 - Unresolved at 8 weeks ⁽⁵⁾

Diffuse Lung Disease (DLD)

- For evaluation of suspected DLD (including diffuse parenchymal and interstitial lung diseases) after initial chest x-ray excludes a more acute disease (such as pneumonia) in the following situations ⁽⁶⁾:
 - Based on restrictive pattern pulmonary function test
 - In patients with known collagen vascular disease in whom DLD is suspected
 - For biopsy guidance when DLD is suspected ⁽⁷⁾
 - With signs or symptoms unresponsive to treatment such as:
 - Shortness of breath
 - Persistent dyspnea
 - Persistent cough

- For reassessment of known DLD
 - Annually **OR**
 - For clinical progression of disease

NOTE: Chest CT for evaluation of DLD is typically performed with a high-resolution protocol (HRCT)

Sarcoidosis ⁽⁸⁾

- For suspected sarcoidosis after initial workup including Chest x-ray
- For known sarcoidosis when there are **EITHER** symptoms of progression (including normal CXR with unexplained dyspnea or cough) **OR** progression on Chest x-ray

Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) ⁽⁹⁾

- Advanced imaging for GPA is indicated with any **ONE** of the following:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area are needed to guide systemic therapy

NOTE: Imaging of the Sinus, Neck and/or Abdomen may also be indicated for GPA as involvement of the airway, lungs, and/or kidneys is common

Tuberculosis (TB) ⁽¹⁰⁾

Known or suspected tuberculosis and initial chest x-ray completed

Esophagus / Pharynx

- Indicated for the evaluation of dysphagia after appropriate prior work up including endoscopy (EGD) and/or fluoroscopic studies (such as modified barium swallow, biphasic esophogram) is indeterminate or abnormal ⁽¹¹⁾

Chronic Cough ⁽¹²⁾

- Symptoms > 8 weeks and chest x-ray completed and **any** of the following:
 - Clinical concern for bronchiectasis
 - After evaluation for other causes and failed treatment for those diagnosed with:
 - Asthma
 - Gastroesophageal Reflux Disease
 - Discontinuation of ACE inhibitors
 - Postnasal drip

Thoracic Aortic Disease (13–16)

Screening for possible Thoracic Aortic Aneurysm (TAA)

- Screening in individuals with a personal history of bicuspid aortic valve when prior TTE (Transthoracic Echocardiogram) is indeterminate or abnormal:

NOTE: Typical TTE follow-up imaging intervals for bicuspid aortic valve patients:

 - Baseline study at initial diagnosis of bicuspid aortic valve
 - Follow-up imaging is based on findings on prior imaging of a dilated aorta of > 40 mm is typically every 2-3 years thereafter
- Screening in individuals at elevated risk due to family history when TTE (Transthoracic Echocardiogram) is inconclusive or insufficient as clinically indicated with any **ONE** of the following ⁽¹⁴⁾:
 - First-degree relatives of individuals with a known aortic dissection **OR** known thoracic aortic aneurysm (defined as 1.5 times (> 50%) larger than the predicted aorta size based on age, sex, body size)
 - First and/or second-degree relatives of individuals with heritable thoracic aorta disease (HTAD) (HTAD comprises a clinically and genetically heterogeneous group of disorders sharing the common denominator of aneurysm or dissection of the thoracic aorta)

NOTE: previous analogous terminology includes familial thoracic aortic aneurysm and dissection (FTAAD) and non-syndromic heritable thoracic aortic disease (NS-TAD))
 - First degree relatives of individuals with a known bicuspid aortic valve
- See **Imaging in Known Genetic Conditions** section for additional indications for screening

Thoracic Aortic Aneurysm (TAA)

- **Asymptomatic** known or suspected thoracic aortic aneurysm
 - With prior indeterminate or abnormal imaging (such as echocardiogram or chest x-ray)
- **Symptomatic** known or suspected thoracic aortic aneurysm:
 - Signs and Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen
 - Asymmetric blood pressure between limbs
 - Acute chest or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, or connective tissue disorder (e.g., Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome))

Thoracic Aortic Syndromes ^(14,15)

- For **suspected** acute aortic syndrome (AAS) (such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) with any **ONE** of the following:
 - Prior imaging (such as echocardiogram) is suggestive of AAS
 - **High risk** patient for AAS and **one** sign/symptom concerning for AAS :
 - **High risk** conditions:
 - Marfan's syndrome or other connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation and/or known thoracic aortic aneurysm
 - **Signs and symptoms** concerning for AAS:
 - Chest, back or abdominal pain described as abrupt onset, severe in intensity and/or ripping or tearing in quality
 - Pulse deficit or systolic blood pressure differential
 - Focal neurologic deficit with pain
 - New heart murmur with pain
 - Hypotension or shock
 - **Non-high-risk** patient and **two** or more signs/symptoms concerning for AAS (see above)
- For follow-up of **known** aortic syndromes, including aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer (frequency for follow up is as clinically indicated)
- Suspected vascular cause of dysphagia (from vascular compression of the esophagus) or expiratory wheezing (from vascular compression of the trachea/bronchus) with prior imaging that is indeterminate or abnormal.

Follow-Up of Known Thoracic Aortic Aneurysm

- Baseline study at diagnosis, then every 6-24 months
 - If there is a change in clinical status or cardiac exam, then imaging sooner than 6 months is indicated

Postoperative Follow-up of Aortic Repair

- Follow-up thoracic endovascular aortic repair (TEVAR) at the following intervals ^(14,15):
 - Baseline study at 1-month post-EVAR
 - Annually thereafter if stable
 - More frequent imaging (as clinically indicated) may be needed if there are complications or abnormal findings on surveillance imaging
 - After 5 post-operative years without complications, continuing follow-up every 5

years should be considered

- Follow up after thoracic aorta open repair at the following intervals:
 - At one-year post-repair
 - Every 5 years thereafter
 - If abnormal findings are seen on any surveillance imaging study, imaging is then done annually

Non-Aortic Vascular Disease

- Superior Vena Cava (SVC) syndrome when CTA/MRA are contraindicated or cannot be performed ⁽¹⁷⁾
 - SVC syndrome is a clinical diagnosis and may be suspected when there are signs of venous congestion in the upper body (such as shortness of breath, distended neck veins and facial/upper extremity edema)
- Neurogenic or venous thoracic outlet syndrome ⁽¹⁸⁾
- Suspected pulmonary hypertension when other testing (echocardiogram or right heart catheterization) is suggestive of the diagnosis ⁽¹⁹⁾

NOTE: Chest CT is **NOT** indicated for Pulmonary Embolism (PE) see Evolent Clinical Guideline 2020 for Chest CTA

Congenital Malformation

- Thoracic malformation on chest x-ray ⁽²⁰⁾
- Congenital heart disease with pulmonary hypertension ⁽²¹⁾
- Malformations (such as pectus excavatum, pectus carinatum, scoliosis) in patients with cardiorespiratory symptoms for whom treatment is being considered ⁽²²⁾

Transplants

Pre-transplant

- Prior to solid organ transplantation (donor or recipient)
- For workup prior to Bone Marrow Transplant (BMT)

Post-transplant ⁽²³⁾

- Routine surveillance of prior lung transplantation
- Concern for complication at any time following lung transplantation (CXR not required)

Chest Wall Pain and Injuries

- Non-traumatic chest wall pain with normal chest x-ray and or rib x-ray with any **ONE** of the following ⁽²⁴⁾:

- Suspicion of malignancy
- Signs and symptoms of infection, such as fever, elevated inflammatory markers, known infection at other sites
- History of chest radiation or chest surgery
- Suspected chest wall injuries (including musculotendinous, costochondral cartilage, sternoclavicular joint, and manubriosternal joint injuries) with prior non-diagnostic or indeterminate imaging (such as x-ray or ultrasound) when imaging will potentially alter management
- Recent blunt trauma and suspected pleural effusion with recent chest x-ray ⁽⁴⁾

Other Indications

- Pneumothorax on chest x-ray when imaging findings will change management
- Hemoptysis after x-ray completed ⁽²⁵⁾
- Vocal cord paralysis on endoscopic exam
- Phrenic nerve paralysis on diaphragm fluoroscopy (fluoroscopic) sniff test
- Evaluation of possible airway pathology with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as X-ray, ultrasound, fluoroscopy)
 - Clinical evidence suggesting airway obstruction (such as stridor, stertor, dyspnea on exertion)
 - For evaluation of known or suspected tracheal stenosis ⁽²⁶⁾
- Large type IV hiatal hernia or diaphragmatic hernia (e.g. Bochdalek, Morgagni or Congenital) ^(27,28)
- For fever of unknown origin (temperature of ≥ 101 degrees for a minimum of 3 weeks) after all of the following has been completed and a source is **not** identified: complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, serologic testing (EBV, EMV, HIV and hepatitis), tuberculin test and Abdomen and Pelvis CT or MRI ⁽²⁹⁾

Suspected Malignancy

- Further evaluation of one of the following identified on another imaging study:
 - Lymphadenopathy
 - Mediastinal mass ⁽³⁰⁾
 - Lung mass not described as a nodule (generally > 3 cm)
 - Pleural thickening, nodule or mass
 - Chest wall mass ⁽³¹⁾

NOTE: For any of the above: one follow-up study to ensure stability is indicated.

Additional follow-up studies indicated only if there is a change in the finding on repeat imaging

- For further evaluation of the following:
 - Weight loss of $\geq 5\%$ over 12 months **AND** signs and symptoms consistent with a source in the chest (such as a smoker with a cough) after initial Chest X-ray ⁽³²⁾
 - Weight loss of $\geq 5\%$ over 12 months when initial evaluation with Chest X-ray, age-appropriate cancer screening (such as colonoscopy and mammography), labs (including CBC, CMP, HbA1C, TSH, stool hemoccult, ESR/CRP, HIV, Hepatitis C) fail to identify a cause **AND** there is documented further decline in weight ⁽³²⁾
 - Documentation of concern for malignancy (i.e. lymphoma) and any one of the following B symptoms:
 - Fevers $> 101^{\circ}\text{F}$
 - Drenching night sweats
 - Unexplained weight loss of $> 10\%$ body weight
 - Gestational trophoblastic disease when hCG fails to decline appropriately following surgery
 - Suspected paraneoplastic syndrome (including dermatomyositis) when appropriate workup has been done and there is a suspicion of malignancy ⁽³²⁾
 - Evaluation for suspected thymoma screening in Myasthenia Gravis patients ⁽³³⁾

Known Malignancy

Initial Staging

- Chest CT is appropriate for initial staging of the majority of malignancies when either biopsy proven or suspected based on prior imaging

Restaging

- Chest CT is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the majority of cancers
- Chest CT is indicated **in addition to PET** while on active treatment every 2-3 cycles of chemo or immunotherapy for the following: Ewing Sarcoma ⁽³⁴⁾, Osteosarcoma ⁽³⁵⁾, Hodgkin Lymphoma ⁽³⁶⁾, Pediatric Aggressive Mature B-Cell Lymphomas ⁽³⁷⁾, Pediatric Hodgkin Lymphoma ⁽³⁸⁾, Soft Tissue Sarcoma ⁽³⁴⁾ (if receiving systemic chemotherapy)

Recurrence

Chest CT is appropriate evaluation of a suspected recurrence for a patient with a known history of malignancy

Surveillance

Chest CT is indicated during surveillance for the following malignancies at the intervals defined below:

NOTE: For any patient with stage IV cancer (any type) that is either in remission or on a treatment break, chest CT is indicated every 3-6 months

- Adrenocortical Carcinoma: every 3-12 months for 5 years then as clinically indicated ⁽³⁹⁾
- Anal Carcinoma: every 3-6 months for 1-2 years, then every 6-12 months for an additional year ⁽⁴⁰⁾
- Biliary Tract Cancers (Ampullary Adenocarcinoma, Cholangiocarcinoma and Gallbladder): every 3-6 months for 2 years then every 6-12 months for up to 5 years then as clinically indicated ^(41,42)
- Bladder Cancer (Muscle Invasive **OR** Urothelial Carcinoma of the Upper Urinary Tract, Prostate or Urethra): every 3-6 months for 2 years, then annually for up to 5 years then as clinically indicated ⁽⁴³⁾
- Bone Tumors and Sarcomas (Chondrosarcoma, Chordoma, Giant Cell Tumor of Bone, Ewing Sarcoma, Soft Tissue Sarcoma, Osteosarcoma) ⁽³⁵⁾
 - Every 3-6 months for 5 years, then annually for an additional 5 years, then as clinically indicated
- Colon Cancer ⁽⁴⁴⁾:
 - Stage II: every 6-12 months for 5 years, then as clinically indicated
 - Stage III: every 3 months for 2 years, then every 6-12 months for 3 years, then as clinically indicated
- Esophageal and Esophagogastric Junction Cancers: every 3-6 months for 2 years, then annually for up to 5 years ⁽⁴⁵⁾
- Gastric Cancer: every 6 months for 2 years, then annually up to 5 years ⁽⁴⁶⁾
- Hepatocellular Carcinoma: every 3-6 months for 2 years, then every 6 months indefinitely ⁽⁴⁷⁾
- Lymphoma (Follicular, Diffuse Large B-Cell, Burkitt, Hodgkin, Marginal Zone, T-Cell) and Hairy Cell Leukemia: every 3-6 months for 2 years, then annually ^(36,48–50)
- Melanoma: Cutaneous (stage II or higher): every 3-12 months for 2 years then every 6-12 months for 3 years, then as clinically indicated ⁽⁵¹⁾
- Melanoma: Uveal every 3-6 months for 5 years, then every 6-12 months for 5 additional years then as clinically indicated ⁽⁵²⁾
- Merkel Cell Carcinoma: every 3-6 months for 3 years, then every 6-12 months indefinitely ⁽⁵³⁾
- Mesothelioma (Pleural and Peritoneal): every 3-6 months for 5 years then annually until 10 years, then as clinically indicated ^(54,55)

- Neuroblastoma: every 3 months for 1 year, then every 6-12 months for 1 year, then annually for 1 year, then as clinically indicated ⁽⁵⁶⁾
- Neuroendocrine Tumors: every 3-6 months for 5 years then every 6-12 months for 5 years, then as clinically indicated ⁽³⁹⁾
- Non-Small Cell Lung Cancer: every 3 months for 3 years, then every 6 months for 2 years, then annually ⁽⁵⁷⁾
- Occult Primary Tumors: follow indications based on how cancer is being treated (e.g. if treating as head and neck, defer to head and neck cancer guidance for all future requests). If tumor type is unclear: every 3-6 months for 2 years, then every 6-12 months for 3 years then annually. ⁽⁵⁸⁾
- Ovarian cancer: every 3-6 months for 2 years then every 6-12 months for 3 years, then as clinically indicated ⁽⁵⁹⁾
- Pancreatic cancer: every 3-6 months for 2 years, then every 6-12 months as clinically indicated ⁽⁶⁰⁾
- Penile cancer: Every 3 months for 1 year, then every 6-12 months for 3 years, then as clinically indicated ⁽⁶¹⁾
- Prostate Cancer: as clinically indicated ⁽⁶²⁾
- Renal Cell Carcinoma ⁽⁶³⁾:
 - Stage I - annually for 5 years, then as clinically indicated
 - Stage II and higher - every 3-6 months for 3 years, then annually for 2 years, then as clinically indicated
- Rectal Cancer ⁽⁶⁴⁾:
 - Stage II, III - every 6-12 months for 5 years, then as clinically indicated
- Small Bowel Adenocarcinoma: every 6-12 months for 5 years ⁽⁶⁵⁾
- Small Cell Lung Cancer: every 2 months for the first year, every 3-4 months for years 2 and 3 then every 6 months during years 4 and 5 then annually ⁽⁶⁶⁾
- Soft Tissue Sarcoma: every 3-6 months for 2 years, then every 6-12 months for 3 years, then annually as clinically indicated ⁽³⁴⁾
- Testicular cancer (Stage IIA and higher): every 3 months for 1 year, then every 6 months for 1 year then annually for 2 years ⁽⁶⁷⁾
- Thymoma and Thymic Carcinoma: every 3-6 months for 2 years, then annually for up to 10 years ⁽⁶⁸⁾
- Wilm's Tumor: every 3 months for 2 years then every 6 months for 2 years ⁽⁶⁹⁾

When a cancer is not listed above, Chest CT is not routinely a part of surveillance for that cancer in an asymptomatic patient. There would need to be a sign or symptom of recurrence to consider Chest CT.

When the timeframe above for routine surveillance has elapsed, there would need to be a sign or symptom of recurrence to consider Chest CT.

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative evaluation:

- Pre-operative evaluation for Electromagnetic Navigation Bronchoscopy ⁽⁷⁰⁾ (this is a non-diagnostic CT)
- Imaging of the area requested is needed to develop a surgical plan

Postoperative evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- Alpha-1 Anti-Trypsin Deficiency (AATD): at diagnosis ⁽⁷¹⁾
- BAP1-TPDS (BAP-1 tumor predisposition syndrome): with clinical concerns for malignant mesothelioma ⁽⁷²⁾
- BHDS (Birt-Hogg-Dube): annually starting at age 20 (or earlier with family history of renal tumors diagnosed before age 30) ⁽⁷³⁾
- Cystic Fibrosis - chest CT every 2 years and as needed to assess for bronchiectasis ⁽⁷⁴⁾
- Li-Fraumeni (TP53): annually ⁽⁷⁵⁾
- Multiple Endocrine Neoplasia type 1 (MEN1): annually starting at age 8 ^(39,76)

- Hereditary Paraganglioma-Pheochromocytoma (PGL/PCC) Syndrome (including SDHx mutations): every 2 years (including at diagnosis) **AND** MRI is contraindicated or cannot be performed ⁽⁷⁷⁾
- Tuberous Sclerosis: every 5 years OR more frequently for follow-up of known findings or symptoms ⁽⁷⁸⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance.

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest CT and Brain/Abdomen/Pelvis MRI

- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1) ^(39,76)
 - Annually starting at age 8
 - **NOTE:** every 3 years include Brain MRI

Neck/Chest/Abdomen/Pelvis CT

- Hereditary PGL/PCC Syndromes (including SDHx mutations): every 2 years (including at diagnosis) **AND** MRI is contraindicated or cannot be performed ^(63,77)

OTHER COMBINATION STUDIES WITH CHEST CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest/Abdomen and Pelvis CT

- As numerous disease processes, including but not limited to malignancy, may affect the chest, abdomen and pelvis, this combination is indicated when the guideline criteria for **BOTH** Chest CT and Abdomen and Pelvis CT have been met
- Documentation of concern for malignancy (such as lymphoma) and any **ONE** of the following B symptoms:
 - Fevers > 101° F
 - Drenching night sweats
 - Unexplained weight loss of > 10% body weight

Chest/Abdomen CT

- Large type IV hiatal hernia or diaphragmatic hernia (e.g. Bochdalek, Morgagni or Congenital)

Chest CT/Abdomen and Pelvis CT and PET

- CT of the original sites of disease is indicated in addition to PET while on active treatment every 2-3 cycles of chemo or immunotherapy for the following: Hodgkin Lymphoma, Pediatric Aggressive Mature B-Cell Lymphomas, Pediatric Hodgkin Lymphoma

Neck/Chest/Abdomen/Pelvis CT

- Hereditary PGL/PCC (Paraganglioma/Pheochromocytoma) syndromes (including SDHx mutations): every 2 years (including at diagnosis) **AND** MRI is contraindicated or cannot be performed ^(63,77) Chest CT and PET
- Chest CT is indicated **in addition to PET** while on active treatment every 2-3 cycles of chemo or immunotherapy for the following: Ewing Sarcoma, Osteosarcoma, Soft Tissue Sarcoma (if receiving systemic chemotherapy)

Chest CTA (or MRA) and Chest CT

- When needed for clarification of vascular involvement from tumor

Neck/Chest CT

- Vocal cord immobility on endoscopic exam with concern for recurrent laryngeal nerve lesion
- Phrenic nerve paralysis on diaphragm fluoroscopy (fluoroscopic sniff test)
- Evaluation of possible airway pathology with any **ONE** of the following:
 - Indeterminate or abnormal prior imaging (such as x-ray, ultrasound, fluoroscopy)
 - Clinical evidence suggesting airway obstruction (such as stridor, stertor, dyspnea on exertion)
 - For evaluation of known or suspected laryngeal, subglottic, or tracheal stenosis ⁽²⁶⁾
- Evaluation of dysphagia after appropriate prior work up including endoscopy (EGD) and/or fluoroscopic studies (such as modified barium swallow, biphasic Esophogram) is indeterminate or abnormal ⁽¹¹⁾

Sinus/Maxillofacial/Neck/Chest/Abdomen CT

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) with **ONE** of the following ⁽⁹⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))

- Known GPA_when imaging results of a specific anatomic area is needed to guide systemic therapy

Sinus/Chest/Abdomen/Pelvis CT and Brain MRI

- Prior to all types of Bone Marrow Transplant

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Brain, Neck, Chest, Abdomen, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine

CODING AND STANDARDS

Codes

71250, 71260, 71270, +0722T

Chest CT Coding Standards

This Chest CT Guideline covers CPT codes 71250 (CT chest without contrast), CT chest with contrast (71260), CT chest without and with contrast (71270). When 71271 is listed in billable codes, this guideline also covers Low dose CT scan (LDCT) for lung cancer screening.

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Suspected paraneoplastic syndromes with no established cancer diagnosis: laboratory evaluation and imaging.

The laboratory evaluation for paraneoplastic syndrome is complex. If the appropriate lab test results are suspicious for malignancy, imaging is indicated.

For SIADH (hyponatremia + increased urine osmolality), there is a high association with small cell lung cancer, therefore imaging typically starts with chest CT. If other symptoms suggest a different diagnosis other than small cell lung cancer, different imaging studies may be reasonable.

For hypercalcemia (high serum calcium, low-normal PTH, high PTHrP) it is reasonable to start with bone imaging followed by a more directed evaluation such as mammogram, chest, abdomen and pelvis imaging as appropriate.

For Cushing syndrome (hypokalemia, normal-high midnight serum ACTH NOT suppressed with dexamethasone) abdominal and chest imaging is reasonable. If dexamethasone suppression test DOES suppress ACTH, pituitary MRI is reasonable.

For hypoglycemia, labs drawn during a period of hypoglycemia (glucose < 55, typically a 72 hour fast) (insulin level, C-peptide and IGF-2:IGF-1 ratio) should be done to evaluate for an insulinoma. An elevated insulin level, elevated C-peptide and/or normal IGF-2:IGF-1 ratio warrant CT or MRI abdomen to look for insulinoma. A low insulin, low C-peptide and/or elevated IGF-2:IGF-1 ratio warrant chest and abdominal imaging.

When a paraneoplastic neurologic syndrome is suspected, nuclear and cytoplasmic antibody panels are often ordered to further identify specific tumor types. Results are needed prior to imaging. Because these tests are highly specific, if an antibody highly associated with a specific cancer is positive, then further imaging for that cancer is reasonable. For example, anti-Hu has a high association with SCLC and chest CT would be reasonable. Anti-MA2 has a high association with testicular cancer and testicular ultrasound would be a reasonable next step.

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

Table 1: Lung-RADS Assessment Categories ⁽³⁾

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American College

of Radiology™

Lung-RADS® v2022

Release Date: November 2022

Lung-RADS	Category Descriptor	Findings	Management
0	Incomplete Estimated Population Prevalence: ~1%	Prior chest CT examination being located for comparison (see note 9) Part or all of lungs cannot be evaluated Findings suggestive of an inflammatory or infectious process (see note 10)	Comparison to prior chest CT; Additional lung cancer screening CT imaging needed; 1-3 month LDCT
1	Negative Estimated Population Prevalence: 39%	No lung nodules OR Nodule with benign features: - Complete, central, popcorn, or concentric ring calcifications OR - Fat-containing	
2	Benign - Based on imaging features or indolent behavior Estimated Population Prevalence: 45%	Juxtapleural nodule: < 10 mm (524 mm³) mean diameter at baseline or new AND - Solid; smooth margins; and oval, lentiform, or triangular shape Solid nodule: < 6 mm (< 113 mm³) at baseline OR - New < 4 mm (< 34 mm³) Part solid nodule: < 6 mm total mean diameter (< 113 mm³) at baseline Non solid nodule (GGN): < 30 mm (< 14,137 mm³) at baseline, new, or growing OR ≥ 30 mm (≥ 14,137 mm³) stable or slowly growing (see note 7) Airway nodule, subsegmental - at baseline, new, or stable (see note 11) Category 3 lesion that is stable or decreased in size at 6-month follow-up CT OR Category 4B lesion proven to be benign in etiology following appropriate diagnostic workup	12-month screening LDCT
3	Probably Benign - Based on imaging features or behavior Estimated Population Prevalence: 9%	Solid nodule: ≥ 6 to < 8 mm (≥ 113 to < 268 mm³) at baseline OR - New 4 mm to < 6 mm (34 to < 113 mm³) Part solid nodule: ≥ 6 mm total mean diameter (≥ 113 mm³) with solid component < 6 mm (< 113 mm³) at baseline OR - New < 6 mm total mean diameter (< 113 mm³) Non solid nodule (GGN): ≥ 30 mm (≥ 14,137 mm³) at baseline or new Atypical pulmonary cyst: (see note 12) - Growing cystic component (mean diameter) of a thick-walled cyst Category 4A lesion that is stable or decreased in size at 3-month follow-up CT (excluding airway nodules)	6-month LDCT
4A	Suspicious Estimated Population Prevalence: 4%	Solid nodule: ≥ 8 to < 15 mm (≥ 268 to < 1,767 mm³) at baseline OR - Growing < 8 mm (< 268 mm³) OR - New 6 to < 8 mm (113 to < 268 mm³) Part solid nodule: ≥ 6 mm total mean diameter (≥ 113 mm³) with solid component ≥ 6 mm to < 8 mm (≥ 113 to < 268 mm³) at baseline OR - New or growing < 4 mm (< 34 mm³) solid component Airway nodule, segmental or more proximal - at baseline (see note 11) Atypical pulmonary cyst: (see note 12) - Thick-walled cyst OR - Multilocular cyst at baseline OR - Thin- or thick-walled cyst that becomes multilocular	3-month LDCT; PET/CT may be considered if there is a ≥ 8 mm (≥ 268 mm ³) solid nodule or solid component
4B	Very Suspicious Estimated Population Prevalence: 2%	Airway nodule, segmental or more proximal - stable or growing (see note 11) Solid nodule: ≥ 15 mm (≥ 1,767 mm³) at baseline OR - New or growing ≥ 8 mm (≥ 268 mm³) Part solid nodule: - Solid component ≥ 8 mm (≥ 268 mm³) at baseline OR - New or growing ≥ 4 mm (≥ 34 mm³) solid component Atypical pulmonary cyst: (see note 12) - Thick-walled cyst with growing wall thickness/nodularity OR - Growing multilocular cyst (mean diameter) OR - Multilocular cyst with increased loculation or new/increased opacity (nodular, ground glass, or consolidation) Slow growing solid or part solid nodule that demonstrates growth over multiple screening exams (see note 8)	Referral for further clinical evaluation Diagnostic chest CT with or without contrast; PET/CT may be considered if there is a ≥ 8 mm (≥ 268 mm ³) solid nodule or solid component; tissue sampling; and/or referral for further clinical evaluation Management depends on clinical evaluation, patient preference, and the probability of malignancy (see note 13)
4X	Estimated Population Prevalence: < 1%	Category 3 or 4 nodules with additional features or imaging findings that increase suspicion for lung cancer (see note 14)	
S	Significant or Potentially Significant Estimated Population Prevalence: 10%	Modifier: May add to category 0-4 for clinically significant or potentially clinically significant findings unrelated to lung cancer (see note 15)	As appropriate to the specific finding

Table 2: 2017 Fleischner Society Guidelines for Management of Incidental Detected Pulmonary Nodules ⁽¹⁾

Fleischner Table

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Fleischner Society 2017 Guidelines for Management of Incidentally Detected Pulmonary Nodules in Adults				
A: Solid Nodules*				
Nodule Type	Size			Comments
	<6 mm (<100 mm ³)	6–8 mm (100–250 mm ³)	>8 mm (>250 mm ³)	
Single				
Low risk†	No routine follow-up	CT at 6–12 months, then consider CT at 18–24 months	Consider CT at 3 months, PET/CT, or tissue sampling	Nodules <6 mm do not require routine follow-up in low-risk patients (recommendation 1A).
High risk†	Optional CT at 12 months	CT at 6–12 months, then CT at 18–24 months	Consider CT at 3 months, PET/CT, or tissue sampling	Certain patients at high risk with suspicious nodule morphology, upper lobe location, or both may warrant 12-month follow-up (recommendation 1A).
Multiple				
Low risk†	No routine follow-up	CT at 3–6 months, then consider CT at 18–24 months	CT at 3–6 months, then consider CT at 18–24 months	Use most suspicious nodule as guide to management. Follow-up intervals may vary according to size and risk (recommendation 2A).
High risk†	Optional CT at 12 months	CT at 3–6 months, then at 18–24 months	CT at 3–6 months, then at 18–24 months	Use most suspicious nodule as guide to management. Follow-up intervals may vary according to size and risk (recommendation 2A).
B: Subsolid Nodules*				
Nodule Type	Size			Comments
	<6 mm (<100 mm ³)	≥6 mm (>100 mm ³)		
Single				
Ground glass	No routine follow-up	CT at 6–12 months to confirm persistence, then CT every 2 years until 5 years		In certain suspicious nodules < 6 mm, consider follow-up at 2 and 4 years. If solid component(s) or growth develops, consider resection. (Recommendations 3A and 4A).
Part solid	No routine follow-up	CT at 3–6 months to confirm persistence. If unchanged and solid component remains <6 mm, annual CT should be performed for 5 years.		In practice, part-solid nodules cannot be defined as such until ≥6 mm, and nodules <6 mm do not usually require follow-up. Persistent part-solid nodules with solid components ≥6 mm should be considered highly suspicious (recommendations 4A–4C).
Multiple	CT at 3–6 months. If stable, consider CT at 2 and 4 years.	CT at 3–6 months. Subsequent management based on the most suspicious nodule(s).		Multiple <6 mm pure ground-glass nodules are usually benign, but consider follow-up in selected patients at high risk at 2 and 4 years (recommendation 5A).
Note.—These recommendations do not apply to lung cancer screening, patients with immunosuppression, or patients with known primary cancer.				
* Dimensions are average of long and short axes, rounded to the nearest millimeter.				
† Consider all relevant risk factors (see Risk Factors).				

†There are multiple factors that may place an individual in the high-risk category such as smoking history and nodule characteristics. The designation of high risk may be assigned by the treating provider.

Cancer Risk Factors ⁽¹⁾

- Low Risk Factors

- Young age
- Less smoking
- Smaller nodule size
- Regular margins
- Location other than the upper lobe
- High Risk Factors
 - Older age
 - Heavy smoking
 - Larger nodule size
 - Irregular or spiculated margins
 - Upper lobe location

SUMMARY OF EVIDENCE

Guidelines for management of incidental pulmonary nodules detected on CT images: From the Fleischner Society 2017 ⁽¹⁾

Study Design: This document presents the Fleischner Society guidelines for the management of incidental pulmonary nodules detected on CT images. The guidelines are based on a systematic review of the literature and expert consensus.

Target Population: The target population includes adults with incidentally detected pulmonary nodules on CT scans, excluding those with known primary cancers or who are immunocompromised.

Key Factors: The guidelines provide recommendations for the follow-up and management of solid and subsolid nodules, with specific intervals for follow-up based on nodule size and patient risk factors. The document also discusses the importance of nodule morphology and location in assessing malignancy risk.

ACR Lung-RADS v2022: Assessment Categories and Management Recommendations ⁽³⁾

Study Design: This document provides an update to the ACR Lung-RADS, which is a standardized system for reporting and managing screen-detected pulmonary nodules. The updates are based on a systematic review of the literature and expert consensus.

Target Population: The target population includes patients undergoing lung cancer screening with low-dose CT, particularly those at high risk for lung cancer.

Key Factors: The document introduces new classification criteria for atypical pulmonary cysts, juxtapleural nodules, and potentially infectious findings. It also provides updated management recommendations for these categories and clarifies the definition of nodule growth.

ACR Appropriateness Criteria® Diffuse Lung Disease ⁽⁶⁾

Study Design: This document outlines the ACR Appropriateness Criteria for the evaluation of diffuse lung diseases (DLDs). The guidelines are based on an extensive review of current medical literature and expert opinion.

Target Population: The target population includes patients with suspected or confirmed diffuse lung diseases, such as interstitial lung disease.

Key Factors: The document provides guidelines for initial imaging, imaging during suspected acute exacerbations, and routine follow-up imaging. It emphasizes the importance of high-resolution CT (HRCT) and multidisciplinary discussions for accurate diagnosis and management.

ANALYSIS OF EVIDENCE

Analysis ^(1,3,6):

In summary, while all three articles highlight the importance of chest CT in diagnosing and managing lung diseases, they differ in their specific criteria for nodule classification, focus areas, and follow-up recommendations. The evidence presented in each article supports their respective guidelines and management strategies, providing a comprehensive approach to chest CT in clinical practice.

Shared Findings:

- **Importance of Chest CT:** All three articles emphasize the critical role of chest CT in diagnosing and managing lung diseases. Chest CT is highlighted as a superior imaging modality for detecting and characterizing lung nodules and diffuse lung diseases due to its high resolution and ability to provide detailed images of lung parenchyma.
- **Nodule Management:** The articles discuss the management of lung nodules, particularly the importance of follow-up and monitoring. They agree that the size and characteristics of nodules are crucial in determining the appropriate management strategy.
- **Evidence-Based Guidelines:** Each article presents evidence-based guidelines for the use of chest CT in different clinical scenarios. These guidelines are developed through systematic reviews of the literature and expert consensus.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This Guideline replaces Evolent Clinical Guideline 020 for Chest (Thorax) CT

Date	Summary
	• Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Added airway indication • Lung cancer screening CPT code 71271 and indication removed • Updated language in the preoperative/postoperative section • Added Combination Studies for Known Genetic Conditions section • Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated • Updated combination studies modalities and indications • Added high and low risk factors for Fleischner table (table 2) • Fever of Unknown origin removed from background section
May 2024	• Revised the purpose section • Lung Cancer screening is consistent with Cancer society • Lung nodules sections was clarified for size and follow up studies • Infection and inflammation section added to incorporate indications within the GL that were alone and added in sarcoidosis • Reorganized the malignancy section to follow the Abdomen GLs; for known malignancy Initial staging was broad, Restaging gave the situations not reasonable, and surveillance was each was identified with timelines for acceptable studies • Genetic Syndromes and Rare Diseases was added/adjusted • Combination Studies were expanded upon to coincide with other guidelines/combination studies

LEGAL AND COMPLIANCE

Guideline Approval Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolut Clinical Guideline 2020 for Chest Computed Tomography Angiography (CTA)

Guideline Number: Evolent_CG_2020	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the blood vessels (arteries and/or veins) in the chest that can be evaluated for evidence of stenosis, occlusion, embolism, dissection and/or aneurysms. Chest CTA (non-coronary) is used to evaluate the arteries outside the heart in the chest (thorax). CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function.

NOTE: Authorization for CT Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR CHEST COMPUTED TOMOGRAPHY ANGIOGRAPHY (CTA)

Known or Suspected Pulmonary Embolism (PE) ^(1–5)

- Suspected pulmonary embolism:
 - High risk for PE based on shock or hypotension
 - Documented score from a validated clinical scoring system for the prediction of pulmonary embolism indicating high probability for PE (See **Clinical Assessment of Pulmonary Embolism**) with any **ONE** of the following:
 - Wells score (original version) ≥ 7
 - Geneva score (original version) ≥ 11
 - Geneva score (simplified version) ≥ 5
 - Calculated score (when sufficient clinical data are provided) from a validated

clinical scoring system (See **Clinical Assessment of Pulmonary Embolism**) for the prediction of pulmonary embolism indicating high probability for PE

- **NOTE:** Elevated D-dimer is **NOT** needed for high-risk patients; CTA Chest is indicated for high-risk even with normal D dimer
- Intermediate and Low risk for PE requires an elevated D-dimer
- Follow-up of known pulmonary embolism with symptoms (such as dyspnea, fatigue, lightheadedness and/or edema) that recur **OR** with symptoms that are persistent at 3 months following initial diagnosis
 - **NOTE:** Follow-up imaging in asymptomatic patients to determine if an embolus has resolved or to determine cessation of anticoagulation is **NOT** indicated as imaging findings may persist and are not used to determine the duration of therapy

Thoracic Aortic Disease (6–9)

Screening for Possible Thoracic Aortic Aneurysm (TAA)

- Screening in individuals with a personal history of bicuspid aortic valve when prior TTE (Transthoracic Echocardiogram) is indeterminate or abnormal:
 - **NOTE:** Typical TTE follow-up imaging intervals for bicuspid aortic valve patients:
 - Baseline study at initial diagnosis of bicuspid aortic valve
 - Follow-up imaging is based on findings on prior imaging of a dilated aorta of > 40 mm is typically every 2-3 years thereafter
- Screening in individuals at elevated risk due to family history when TTE (Transthoracic Echocardiogram) is inconclusive or insufficient as clinically indicated with any **ONE** of the following ⁽⁸⁾:
 - First-degree relatives of individuals with a known thoracic aortic aneurysm (defined as 1.5 times (> 50%) larger than the predicted aorta size based on age, sex, body size) **OR** known aortic dissection
 - First and/or second-degree relatives of individuals with heritable thoracic aorta disease (HTAD) (HTAD comprises a clinically and genetically heterogeneous group of disorders sharing the common denominator of aneurysm or dissection of the thoracic aorta)
 - **NOTE:** Previous analogous terminology includes familial thoracic aortic aneurysm and dissection (FTAAD) and non-syndromic heritable thoracic aortic disease (NS-TAD))
 - First degree relatives of individuals with a known bicuspid aortic valve
- See **Imaging in Known Genetic Conditions** section for additional indications for screening

Suspected Thoracic Aortic Aneurysm (TAA)

- **Asymptomatic** suspected thoracic aortic aneurysm:

- With prior indeterminate or abnormal imaging (Such as echocardiogram or chest X-ray)
- **Symptomatic** known or suspected thoracic aortic aneurysm:
 - Signs and Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate aneurysm rupture)
 - Asymmetric blood pressure between limbs
 - Acute chest or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, bicuspid aortic valve, and connective tissue disorder (such as Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome)

Thoracic Aortic Syndromes ^(7,8)

- For **suspected** acute aortic syndrome (AAS) (Such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) with any **ONE** of the following:
 - Prior imaging (such as echocardiogram) is suggestive of AAS
 - **High risk** patient for AAS and **one** sign/symptom concerning for AAS
 - **High risk** conditions for AAS:
 - Marfan's syndrome or other connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation and/or known thoracic aortic aneurysm
 - **Signs and symptoms** concerning for AAS:
 - Chest, back or abdominal pain described as abrupt onset, severe in intensity and/or ripping or tearing in quality
 - Pulse deficit or systolic blood pressure differential
 - Focal neurologic deficit with pain
 - New heart murmur with pain
 - Hypotension or shock
 - **Non-high-risk** patient and **two** or more signs/symptoms concerning for AAS (See above)
- For follow-up of **known** aortic syndromes (Such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) as clinically indicated
- Suspected vascular cause of dysphagia (from vascular compression of the esophagus) or expiratory wheezing (from vascular compression of the trachea/bronchus) with prior imaging that is indeterminate or abnormal.

Follow-Up of Known Thoracic Aortic Aneurysm ^(7,8)

- Baseline study at diagnosis then every 6-24 months
 - If there is a change in clinical status or cardiac exam, then imaging sooner than 6 months is indicated

Postoperative Follow-up of Aortic Repair ^(7,8)

- Follow-up after thoracic endovascular aortic repair (TEVAR) at the following intervals if there is a reason for CTA rather than CT:
 - Baseline study at 1-month post-EVAR
 - Annually thereafter if stable
 - More frequent imaging (as clinically indicated) may be needed if there are complications or abnormal findings on surveillance imaging
 - After 5 post-operative years without complications, continuing follow-up every 5 years should be considered
- Follow-up after thoracic aorta open repair at the following intervals if there is a reason for CTA rather than CT:
 - At one year post-repair
 - Every 5 years thereafter
 - If abnormal findings are seen on any prior surveillance imaging study, imaging is then done annually

Non-Aortic Vascular Disease

- Suspected or known Superior Vena Cava (SVC) syndrome ⁽¹⁰⁾
 - SVC syndrome is a clinical diagnosis and may be suspected when there are signs of venous congestion in the upper body (such as shortness of breath, distended neck veins and facial/upper extremity edema)
- Subclavian steal syndrome after indeterminate or abnormal ultrasound ⁽⁸⁾
- Suspected or known thoracic outlet syndrome ^(11,12)
- Suspected pulmonary hypertension with suggestive prior testing (Such as echocardiogram or CT chest) ^(7,8)
- For patients with fibromuscular dysplasia (FMD) ^(13,14):
 - Baseline vascular study indicated from brain to pelvis
- Takayasu's Arteritis ⁽¹⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) ^(16,17)
 - **NOTE:** CTA/MRA of the brain and neck may also be indicated

Congenital Vascular Disease of the Chest ^(18–20)

- Suspected thoracic malformation with suggestive prior imaging (Such as chest X-ray, echocardiogram, gastrointestinal study, chest CT)
- Congenital heart disease with pulmonary hypertension and/or extra-cardiac vascular anomalies (Such as Tetralogy of Fallot, transposition of the great vessels, truncus arteriosus)
- Suspected coarctation of the aorta with suggestive prior testing (Such as disparity in the pulsations and blood pressures in the legs versus the arms)
- Pulmonary sequestration
 - **NOTE:** Chest MRA preferred for pediatrics or for repeat imaging

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to the following procedures:
 - Ablation for atrial fibrillation
 - Endovascular aneurysm repair (EVAR) ⁽⁸⁾
 - Transcatheter Aortic Valve Replacement (TAVR) ⁽²¹⁾
 - Solid organ transplantation
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post-operative complications (Such as pseudoaneurysms) following interventional vascular procedures (Such surgical bypass grafts, vascular stents, and IVC filters) ⁽²²⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos syndrome (vEDS) ^(23,24):
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities
- Marfan Syndrome ⁽²⁵⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Loeys-Dietz ⁽²⁶⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequent if abnormalities are found
- Williams Syndrome ⁽²⁷⁾:
 - Abdominal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- Turner Syndrome ⁽⁷⁾:
 - Screening with no known vascular abnormality at the following intervals:
 - At diagnosis
 - Every 5 years until age 18
 - Every 10 years in adults
 - Prior to pregnancy/pregnancy planning
 - Annually if any one of the following are present: coarctation of the aorta, aortic dilation, bicuspid aortic valve, hypertension
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdominal Aorta CT Angiography with Lower Extremity Runoff and Chest CTA

- Williams Syndrome: Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽²⁷⁾

Brain/Neck/Chest/Abdomen/Pelvis CTA

- Vascular Ehlers-Danlos syndrome (vEDS): Every 18 months (including at diagnosis) **OR** as clinically indicated to follow known vascular abnormalities ^(23,24)
- Loeys-Dietz: Every two years (including at diagnosis) **OR** more frequently if abnormalities are found ⁽²⁶⁾

Chest/Abdomen/Pelvis CTA

- Marfan syndrome ⁽²⁵⁾:
 - Every 3 years (including at initial diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Williams Syndrome ⁽²⁷⁾
 - Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

OTHER COMBINATION STUDIES WITH CHEST CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdominal Aorta CT Angiography with Lower Extremity Runoff and Chest CTA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease.
 - **NOTE:** Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli

Brain/Neck/Chest/Abdomen/Pelvis CTA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(13,14)
- For assessment in patients with spontaneous coronary artery dissection (SCAD), (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)). ⁽²⁸⁾
 - **NOTE:** Body vascular imaging for SCAD can be performed at the time of coronary angiography
- Takayasu's Arteritis ⁽¹⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Chest/Abdomen CTA

- Evaluation of extensive vascular disease involving the chest and abdominal cavities when pelvic imaging is not needed
- Significant post-traumatic or post-procedural vascular complications when pelvic imaging is not needed

Chest/Abdomen/Pelvis CTA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) ⁽²¹⁾
- Acute aortic dissection ⁽²⁹⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Chest CTA and Chest CT (or MRI)

- When needed for clarification of vascular involvement from tumor

Brain/Neck/Chest CTA

- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) ^(16,17)

CODING AND STANDARDS

Codes

71275

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Clinical Assessment of Pulmonary Embolism

Original Wells Score for Prediction of Pulmonary Embolism ⁽²⁾

Clinical Criteria	Score
Clinical Symptoms of DVT (deep vein thrombosis)	3
Other diagnosis (less likely than pulmonary embolism)	3
Heart rate > 100 bpm	1.5
Surgery in previous 4 weeks or Immobilization ($\geq$ 3 days)	1.5
Previous DVT/PE (pulmonary embolism)	1.5
Hemoptysis	1
Malignancy	1
Clinical Probability	
Low probability of pulmonary embolus	0 – 1
Intermediate probability	2 – 6

High probability	≥ 7

Original and Simplified Geneva Score for Prediction of Pulmonary Embolism ^(2,5)

Clinical Criteria	Original Version	Simplified Version
Age ≥ 65 years	1	1
Previous DVT (deep vein thrombosis) or PE (pulmonary embolism)	3	1
Recent surgery or fracture (within 1 month)	2	1
Active malignant condition	2	1
Unilateral lower limb pain	3	1
Hemoptysis	2	1
Heart rate 75-94 bpm	3	1
Heart rate ≥ 95 bpm	5	2
Unilateral edema of lower limb and pain on deep palpation	4	1
Clinical Probability		
Low probability of Pulmonary Embolus (PE)	0 – 3	0 – 1
Intermediate probability	4 – 10	2 – 4
High probability	≥ 11	≥ 5

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease ⁽⁷⁾

Study Design: This document is a clinical practice guideline developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It includes recommendations based on a comprehensive literature review conducted from January 2021 to April 2021, with additional relevant studies considered through June 2022.

Target Population: The guidelines are intended for clinicians diagnosing and managing patients with aortic disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors:

- **Diagnosis and Management:** Recommendations cover genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance.
- **Imaging Techniques:** Various imaging techniques such as computed tomography, magnetic resonance imaging, echocardiography, and intravascular ultrasound are discussed.
- **Multidisciplinary Teams:** Emphasis on the importance of multidisciplinary aortic teams and shared decision-making.
- **Pregnancy:** Special considerations for managing aortic disease in pregnant patients.

2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS) ⁽²⁾

Study Design: This document is a guideline developed by the European Society of Cardiology (ESC) in collaboration with the European Respiratory Society (ERS). It includes recommendations based on a thorough review of the literature and expert consensus.

Target Population: The guidelines are aimed at clinicians diagnosing and managing patients with acute pulmonary embolism (PE).

Key Factors:

- **Diagnosis:** Recommendations for various diagnostic tests, including D-dimer testing, computed tomographic pulmonary angiography (CTPA), and echocardiography.
- **Risk Assessment:** Detailed risk assessment strategies, including clinical parameters, imaging, and laboratory biomarkers.
- **Treatment:** Guidelines for acute-phase treatment, including anticoagulation, thrombolysis, and mechanical circulatory support.
- **Pregnancy:** Specific recommendations for managing PE in pregnant patients.
- **Long-term Management:** Strategies for chronic treatment and prevention of recurrence.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽⁸⁾

Study Design: This document is a guideline developed by the European Society of Cardiology (ESC) for the management of peripheral arterial and aortic diseases. It includes recommendations based on a comprehensive review of the literature and expert consensus.

Target Population: The guidelines are intended for clinicians managing patients with peripheral arterial and aortic diseases.

Key Factors:

- **Diagnosis:** Recommendations for various diagnostic tests, including duplex ultrasound, computed tomography angiography (CTA), and magnetic resonance angiography (MRA).
- **Screening:** Guidelines for screening for carotid, peripheral arterial, and aortic diseases.
- **Medical Treatment:** Recommendations for lifestyle changes, exercise, and pharmacological therapy.
- **Interventional Treatment:** Guidelines for revascularization and surgical interventions.
- **Follow-up:** Recommendations for follow-up after treatment of aortic aneurysms and acute aortic syndromes.
- **Genetic Diseases:** Specific recommendations for managing genetic and congenital diseases of the aorta.

ANALYSIS OF EVIDENCE

Shared Findings ^(2,7,8):

- All three guidelines emphasize the importance of accurate diagnosis and comprehensive management of cardiovascular diseases, including the use of advanced imaging techniques and multidisciplinary teams.
- They all provide specific recommendations for managing cardiovascular conditions in pregnant patients, highlighting the need for special considerations in this population.
- The guidelines stress the importance of long-term management and follow-up to prevent recurrence and manage chronic conditions.

Conclusion ^(2,7,8):

In summary, while all three guidelines share common themes of diagnosis, management, and long-term care, they each have a unique focus and provide specific recommendations tailored to their respective areas of cardiovascular disease.

POLICY HISTORY

Date	Summary
June 2025	● Guideline number changed from 022-1 to 2020 ● Guideline name changed from Chest CTA to Chest Computed Tomography Angiography (CTA) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Updated Pulmonary Embolism and Thoracic Aortic Disease sections ● Broke down Suspected Thoracic Aortic Disease section into screening criteria and abnormal imaging result or signs/symptoms ● Added Takayasu's Arteritis and Non-Central Horner's Syndrome indications in the Vascular Disease and Combination Studies sections ● Moved fibromuscular dysplasia (FMD) indication from Imaging in Known Genetic Condition section to Non-Aortic Vascular Disease section ● Standardized Preoperative and Postoperative Assessment section ● Separated combination studies section for Genetic and Nongenetic conditions and updated accordingly ● Edited text for clarity and consistency ● Updated Background section and references ● Added a Summary of Evidence and Analysis of Evidence
May 2024	● Updated references ● Added Genetics and Rare Diseases, Evaluation of Tumor, Contraindications and Preferred Studies sections ● Reorganized section Thoracic Aortic Disease

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2019 for Chest Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2019	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Chest Magnetic Resonance Imaging (MRI) generates images of the organs and structures within the chest (thorax) without the use of ionizing radiation. Chest MRI images are affected by motion artifact from respiration, thus is generally not used for evaluation of the lung parenchyma.

INDICATIONS FOR CHEST MRI

Chest Wall Pain and Injuries

- Non-traumatic chest wall pain with normal chest x-ray or rib x-ray with any **ONE** of the following and CT is contraindicated or cannot be performed ⁽¹⁾
 - Signs and symptoms of infection, such as fever, elevated inflammatory markers, known infection at other sites
 - History of chest radiation or chest surgery
- Suspected chest wall injuries (such as musculotendinous, costochondral cartilage, sternoclavicular joint, and manubriosternal joint injuries) after non-diagnostic or indeterminate prior imaging (such as x-ray or ultrasound) when imaging will potentially alter management

Brachial Plexopathy ^(2–5)

- **Traumatic** Brachial Plexopathy: If mechanism of injury is highly suspicious for brachial plexopathy (such as birth trauma, mid-clavicular fracture, shoulder dislocation, contact injury to the neck (burner or stinger syndrome) or penetrating injury) ⁽⁶⁾

- **Non-traumatic** Brachial Plexopathy (including neurogenic thoracic outlet syndrome) when Electromyography/Nerve Conduction Velocity (EMG/NCV) studies are suggestive of brachial plexopathy

NOTE: Either Neck MRI, Shoulder MRI or Chest MRI may be appropriate depending on the location of the injury/plexopathy. Only **ONE** of these three studies is needed to appropriately image the brachial plexus.

Vascular Disease

- Superior vena cava (SVC) syndrome when CTA/MRA are contraindicated or cannot be performed ⁽⁷⁾
- Subclavian Steal Syndrome after positive or inconclusive ultrasound when CTA/MRA are contraindicated or cannot be performed ⁽⁸⁾
- Neurogenic or venous thoracic outlet syndrome ⁽⁹⁾
- Arterial thoracic outlet syndrome when CTA and MRA are contraindicated or cannot be performed ⁽⁹⁾
- Pulmonary hypertension when other testing (echocardiogram or right heart catheterization) is suggestive of the diagnosis ^(10,11)

Thoracic Aortic Disease ^(12–14)

Acute Aortic Syndromes (AAS)

- For **suspected** acute aortic syndrome (AAS) (such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) with any **ONE** of the following:
 - Prior imaging (such as echocardiogram) is suggestive of AAS
 - **High risk** patient for AAS and **one** sign/symptom concerning for AAS:
 - **High risk** conditions for AAS:
 - Marfan's syndrome or other connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation and/or known thoracic aortic aneurysm
 - **Signs and symptoms** concerning for AAS:
 - Chest, back or abdominal pain described as abrupt onset, severe in intensity and/or ripping or tearing in quality
 - Pulse deficit or systolic blood pressure differential
 - Focal neurologic deficit with pain
 - New heart murmur with pain
 - Hypotension or shock
 - **Non-high-risk** patient and **two** or more signs/symptoms concerning for AAS (see above)

- For follow-up of **known** aortic syndromes, including aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer: frequency for follow up is as clinically indicated
- Suspected vascular cause of dysphagia (from vascular compression of the esophagus) or expiratory wheezing (from vascular compression of the trachea/bronchus) with prior imaging that is indeterminate or abnormal.

Postoperative Follow-up of Aortic Repair

- Follow-up thoracic endovascular aortic repair (TEVAR) at the following intervals ^(12,14):
 - Baseline study at 1 month post-EVAR
 - Annually thereafter if stable
 - More frequent imaging (as clinically indicated) may be needed if there are complications or abnormal findings on surveillance imaging
 - After 5 post-operative years without complications, continuing follow-up every 5 years should be considered
- Follow up after thoracic aorta open repair at the following intervals:
 - At one year post-repair
 - Every 5 years thereafter
- If abnormal findings are seen on any surveillance imaging study, imaging is then done annually

Congenital Malformations

- Congenital heart disease with pulmonary hypertension ⁽¹⁵⁾
- Known or suspected pulmonary sequestration ⁽¹⁶⁾
- Congenital non-cardiac non-vascular thoracic malformation on other imaging (such as chest x-ray, echocardiogram, gastrointestinal study or CT) ^(16,17)
- Chest wall malformations (such as pectus excavatum, pectus carinatum, scoliosis) in patients with cardiorespiratory symptoms for whom treatment is being considered ⁽¹⁸⁾

Evaluation of Tumor

- Mediastinum
 - Evaluation for suspected thymoma in Myasthenia Gravis patients ⁽¹⁹⁾
 - For further evaluation of mediastinal masses on prior imaging ⁽²⁰⁾
- Chest Wall ^(21,22)
 - For further evaluation of chest wall mass after prior indeterminate imaging
- Other Chest Masses ⁽²²⁾

- For further evaluation of chest mass when prior imaging suggests MRI as the next step rather than CT

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to catheter ablation in patients with atrial fibrillation ⁽²³⁾
- Imaging of the area is needed to develop a surgical plan

Postoperative Evaluation

- After catheter ablation in patients with atrial fibrillation if complications are suspected ⁽²³⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- ADPKD (Autosomal Dominant Polycystic Kidney Disease) **AND** family history of thoracic aortic dissection: every 2 years (including at diagnosis) ⁽²⁴⁾

NOTE: either cardiac MRI or Chest MRI is indicated for surveillance, not both

- BAP1-TPDS (BAP-1 tumor predisposition syndrome): with clinical concerns for malignant mesothelioma ⁽²⁵⁾
- Cystic Fibrosis - chest MRI (or CT) every 2 years and as needed to assess for bronchiectasis ⁽²⁶⁾
- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1): annually starting at age 8 ^(27,28)

- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Abdomen/Pelvis MRI and Chest CT

- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1) ^(27,28):
 - Annually starting at age 8
 - **NOTE:** Every 3 years include Brain MRI

OTHER COMBINATION STUDIES WITH CHEST MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest MRA (or CTA) and Chest MRI

- When needed for clarification of vascular involvement from tumor

Sinus/Face/Neck/Chest/Abdomen MRI

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) is indicated with any **ONE** of the following ⁽²⁹⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

71550, 71551, 71552, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Nontraumatic Chest Wall Pain ⁽¹⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for Nontraumatic Chest Wall Pain, developed by a multidisciplinary expert panel. It includes an extensive analysis of current medical literature from peer-reviewed journals.

Target Population: Patients presenting with nontraumatic chest wall pain, including those with no history of malignancy, known or suspected malignancy, suspected infectious or inflammatory conditions, and history of prior chest intervention.

Key Factors: Recommendations for initial and secondary imaging strategies, including radiography, CT, MRI, ultrasound, bone scan, and PET/CT. Specific guidelines for different clinical scenarios such as chest wall pain with no history of malignancy, known or suspected

malignancy, and suspected infectious or inflammatory conditions. Evaluation of the diagnostic performance of various imaging modalities in detecting chest wall pain.

ACR Appropriateness Criteria® Plexopathy: 2021 Update ⁽⁴⁾

Study Design: This document is an update of the ACR Appropriateness Criteria for Plexopathy, developed by a multidisciplinary expert panel. It includes an extensive analysis of current medical literature from peer-reviewed journals.

Target Population: Patients presenting with brachial or lumbosacral plexopathy due to various pathologies such as trauma, nerve entrapment, neoplasm, inflammation, infection, autoimmune disease, hereditary disease, and idiopathic etiologies.

Key Factors: Recommendations for initial imaging strategies, including MRI, CT, ultrasound, and PET/CT. Specific guidelines for different clinical scenarios such as nontraumatic plexopathy, traumatic plexopathy, and plexopathy in the context of known malignancy or post-treatment syndrome. Evaluation of the diagnostic performance of various imaging modalities in detecting plexopathy.

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽¹²⁾

Study Design: This document is a clinical practice guideline developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It is based on a comprehensive literature review conducted from January 2021 to April 2021, including studies, reviews, and other evidence published in English.

Target Population: The guideline is intended for clinicians managing patients with aortic disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors: Recommendations for diagnosis, genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance of patients with aortic disease. Detailed guidelines on imaging techniques such as computed tomography, magnetic resonance imaging, echocardiography, and ultrasound. Emphasis on the role of multidisciplinary aortic teams and shared decision-making.

ANALYSIS OF EVIDENCE

Analysis ^(1,4,12):

In summary, while all three articles highlight the importance and diagnostic accuracy of MRI, they differ in their specific focus areas, imaging techniques, and clinical scenarios. The shared conclusions emphasize MRI's non-invasive nature and its critical role in providing detailed anatomical and pathological information. The differing conclusions reflect the unique considerations and recommendations for using MRI in diagnosing aortic disease, plexopathy, and chest wall pain.

Shared Conclusions

- **Importance of MRI:** All three articles emphasize the importance of MRI in diagnosing various conditions. MRI is highlighted for its superior soft-tissue contrast and ability to provide detailed anatomical and pathological information.
- **Non-invasive Nature:** MRI is consistently noted for being a non-invasive imaging modality, making it a preferred choice for patients who need detailed imaging without the risks associated with invasive procedures.
- **Diagnostic Accuracy:** The articles agree on the high diagnostic accuracy of MRI in identifying and characterizing lesions, whether they are related to aortic disease, plexopathy, or chest wall pain.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This guideline replaces Evolent Clinical Guideline 021 for Chest (Thorax) MRI ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Updated Vascular Disease section with neurogenic or venous thoracic outlet syndrome and arterial thoracic outlet syndrome indications ● Acute Aortic Syndromes section: ○ Added non-high risk ○ Added suspected vascular cause of dysphagia ● Updated language in the preoperative/postoperative section ● Adjusted surveillance for MEN-1 in genetics section ● Added combinations section for genetics ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Added Sinus/Face/Neck/Chest/Abdomen MRI combo ● Applicable Line of Business adjusted – Medicare checked ● Reduced background section
June 2024	● Brachial plexopathy to be consistent with other relevant guidelines ● Acute aortic syndromes aligned with other Guidelines and given more detail ● Added section for Genetic Syndromes ● Added Contraindications and Preferred studies section to the

Date	Summary
	Background Added Combination Studies section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolut Clinical Guideline 2021 for Chest Magnetic Resonance Angiography (MRA)

Guideline Number: Evolut_CG_2021	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) generates images of the blood vessels (arteries and/or veins) in the chest that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. Chest MRA (non-coronary) is used to evaluate the blood vessels outside the heart in the chest (thorax).

NOTE: Authorization for MR Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR CHEST MAGNETIC RESONANCE ANGIOGRAPHY (MRA)

Known or Suspected Pulmonary Embolism (PE) ^(1–5)

- Suspected pulmonary embolism **when CTA is contraindicated or cannot be performed:**
 - **High risk** for PE based on shock or hypotension
 - **Documented** score from a validated clinical scoring system for the prediction of pulmonary embolism indicating **high probability for PE** (See **Clinical Assessment of Pulmonary Embolism**) with any **ONE** of the following:
 - Wells score (original version) ≥ 7
 - Geneva score (original version) ≥ 11
 - Geneva score (simplified version) ≥ 5
 - **Calculated** score (when sufficient clinical data are provided) from a validated

clinical scoring system (See **Clinical Assessment of Pulmonary Embolism**) for the prediction of pulmonary embolism indicating high probability for PE

- **NOTE:** Elevated D-dimer is **NOT** needed for high-risk patients; CTA Chest is indicated for high-risk even with normal D dimer
- Intermediate and Low risk for PE requires an elevated D-dimer
- Follow-up of known pulmonary embolism when CTA is **contraindicated** or cannot be performed with symptoms (such as dyspnea, fatigue, lightheadedness and/or edema) that recur **OR** with symptoms that are persistent at 3 months following initial diagnosis
 - **NOTE:** Follow-up imaging in asymptomatic patients to determine if an embolus has resolved or to determine cessation of anticoagulation is **NOT** indicated as imaging changes may persist and therefore follow-up imaging is not useful to determine the duration of therapy

Thoracic Aortic Disease ^(6–9)

Screening for Possible Thoracic Aortic Aneurysm (TAA)

- Screening in individuals with a personal history of bicuspid aortic valve when prior TTE (Transthoracic Echocardiogram) is indeterminate or abnormal:
 - **NOTE:** Typical TTE follow-up imaging intervals for bicuspid aortic valve patients:
 - Baseline study at initial diagnosis of bicuspid aortic valve
 - Follow-up imaging is based on findings on prior imaging of a dilated aorta of > 40 mm is typically every 2-3 years thereafter
- Screening in individuals at elevated risk due to family history when TTE (Transthoracic Echocardiogram) is inconclusive or insufficient as clinically indicated with any **ONE** of the following ⁽⁸⁾:
 - First-degree relatives of individuals with a known thoracic aortic aneurysm (defined as 1.5 times (> 50%) larger than the predicted aorta size based on age, sex, body size) **OR** known aortic dissection
 - First and/or second-degree relatives of individuals with heritable thoracic aorta disease (HTAD) (HTAD comprises a clinically and genetically heterogeneous group of disorders sharing the common denominator of aneurysm or dissection of the thoracic aorta)
 - **NOTE:** Previous analogous terminology includes familial thoracic aortic aneurysm and dissection (FTAAD) and non-syndromic heritable thoracic aortic disease (NS-TAD))
 - First degree relatives of individuals with a known bicuspid aortic valve
- See **Imaging in Known Genetic Conditions** section for additional indications for screening

Suspected Thoracic Aortic Aneurysm (TAA)

- **Asymptomatic** suspected thoracic aortic aneurysm:

- With prior indeterminate or abnormal imaging (Such as echocardiogram or chest X-ray)
- **Symptomatic** known or suspected thoracic aortic aneurysm:
 - Signs and symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate aneurysm rupture)
 - Asymmetric blood pressure between limbs
 - Acute chest or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, bicuspid aortic valve, and connective tissue disorder (Such as Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome)

Thoracic Aortic Syndromes ^(7,8)

- For **suspected** acute aortic syndrome (AAS) (Such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) with any **ONE** of the following:
 - Prior imaging (such as echocardiogram) is suggestive of AAS
 - **High risk** patient for AAS and **one** sign/symptom concerning for AAS
 - **High risk** conditions for AAS:
 - Marfan's syndrome or other connective tissue disease, family history of aortic disease, known aortic valve disease, recent aortic manipulation and/or known thoracic aortic aneurysm
 - **Signs and symptoms** concerning for AAS:
 - Chest, back or abdominal pain described as abrupt onset, severe in intensity and/or ripping or tearing in quality
 - Pulse deficit or systolic blood pressure differential
 - Focal neurologic deficit with pain
 - New heart murmur with pain
 - Hypotension or shock
 - **Non-high-risk** patient and **two** or more signs/symptoms concerning for AAS (See above)
- For follow-up of **known** aortic syndromes (Such as aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer) as clinically indicated
- Suspected vascular cause of dysphagia (from vascular compression of the esophagus) or expiratory wheezing (from vascular compression of the trachea/bronchus) with prior imaging that is indeterminate or abnormal.

Follow-up of Known Thoracic Aortic Aneurysm ^(7,8)

- Baseline imaging at diagnosis then every 6-24 months
 - If there is a change in clinical status or cardiac exam, then imaging sooner than 6 months is indicated

Post-operative Follow Up of Aortic Repair ^(7,8)

- Follow-up after thoracic endovascular aortic repair (TEVAR) at the following intervals if there is a reason for MRA rather than CT
 - Baseline study at 1-month post-EVAR
 - Annually thereafter if stable
 - More frequent imaging (as clinically indicated) may be needed if there are complications or abnormal findings on surveillance imaging
 - After 5 post-operative years without complications, continuing follow-up every 5 years should be considered
- Follow-up after thoracic aorta open repair at the following intervals if there is a reason for MRA rather than CT
 - At one year post-repair
 - Every 5 years thereafter
 - If abnormal findings are seen on any prior surveillance imaging study, imaging is then done annually

Non-Aortic Vascular Disease

- Suspected or known Superior Vena Cava (SVC) syndrome ⁽¹⁰⁾
 - SVC syndrome is a clinical diagnosis and may be suspected when there are signs of venous congestion in the upper body (such as shortness of breath, distended neck veins and facial/upper extremity edema)
- Subclavian steal syndrome after indeterminate or abnormal ultrasound ⁽⁸⁾
- Suspected or known thoracic outlet syndrome ^(11,12)
- Suspected pulmonary hypertension with suggestive prior testing (Such as echocardiogram or CT chest) ^(7,8)
- For patients with fibromuscular dysplasia (FMD) ^(13,14):
 - Baseline vascular study indicated from brain to pelvis
- Takayasu's Arteritis ⁽¹⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) ^(16,17)
 - **NOTE:** CTA/MRA of the brain and neck may also be indicated

Congenital Vascular Disease of the Chest ^(18–20)

- Suspected thoracic malformation based with suggestive prior imaging (Such as chest X-ray, echocardiogram, gastrointestinal study or chest CT)
- Congenital heart disease with pulmonary hypertension and/or extra-cardiac vascular anomalies (Such as Tetralogy of Fallot, transposition of the great vessels, truncus arteriosus)
- Suspected coarctation of the aorta with suggestive prior testing (Such as disparity in the pulsations and blood pressures in the legs versus the arms)
- Pulmonary sequestration

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to the following procedures:
 - Ablation for atrial fibrillation
 - Endovascular aneurysm repair (EVAR) ⁽⁸⁾
 - Transcatheter Aortic Valve Replacement (TAVR) ⁽²¹⁾
 - Solid organ transplantation
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post-operative complications (Such as pseudoaneurysms) following interventional vascular procedures (Such surgical bypass grafts, vascular stents, and IVC filters) ⁽²²⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos syndrome ^(23,24):
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities
- Marfan Syndrome ⁽²⁵⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Loeys-Dietz ⁽²⁶⁾:
 - Every two years (including at diagnosis) **OR**
 - More frequent if abnormalities are found
- Williams Syndrome ⁽²⁷⁾:
 - Abdominal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- Turner Syndrome ⁽⁷⁾:
 - Screening with no known vascular abnormality at the following intervals:
 - At diagnosis
 - Every 5 years until age 18
 - Every 10 years in adults
 - Prior to pregnancy/pregnancy planning
 - Annually if any one of the following are present: coarctation of the aorta, aortic dilation, bicuspid aortic valve, hypertension
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Vascular Ehlers-Danlos syndrome(vEDS): Every 18 months (including at diagnosis) **OR** as clinically indicated to follow known vascular abnormalities ^(23,24)
- Loeys-Dietz: Every two years (including at diagnosis) **OR** more frequently if abnormalities are found ⁽²⁶⁾

Chest/Abdomen/Pelvis MRA

- Marfan syndrome ⁽²⁵⁾:
 - Every 3 years (including at initial diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Williams Syndrome ⁽²⁷⁾:
 - Abdomen vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

OTHER COMBINATION STUDIES WITH CHEST MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(13,14)
- For assessment in patients with spontaneous coronary artery dissection (SCAD), (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)). ⁽²⁸⁾
 - **NOTE:** Body vascular imaging for SCAD can be performed at the time of coronary angiography
- Takayasu's Arteritis ⁽¹⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Chest/Abdomen/Pelvis/Lower Extremity MRA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease.
 - **NOTE:** Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli.

Chest/Abdomen/Pelvis MRA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present when CTA is contraindicated or cannot be performed
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) when CTA is contraindicated or cannot be performed ⁽²¹⁾
- Acute aortic dissection ⁽²⁹⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Chest MRA and Chest MRI (or CT)

- When needed for clarification of vascular involvement from tumor

Chest MRA and Heart MRI (or CT)

- When medical necessity criteria indications are met for each Chest MRA (see above) and Heart MRI (see Evolent_CG_7297) or Heart CT (see Evolent_CG_7296) (such as for certain congenital malformations when evaluation of extra cardiac and cardiac structures are needed)

Brain/Neck/Chest MRA

- Non-Central Horner's Syndrome (Secondary/preganglionic or tertiary/post-ganglionic) to evaluate for a vascular source (Such as dissection, aneurysm, arteritis) ^(16,17)

CODING AND STANDARDS

Codes

71555

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Clinical Assessment of Pulmonary Embolism

Original Wells Score for Prediction of Pulmonary Embolism ⁽²⁾

Clinical Criteria	Original Version
Clinical Symptoms of DVT (deep vein thrombosis)	3
Other diagnosis (less likely than pulmonary embolism)	3
Heart rate > 100 bpm	1.5
Surgery in previous 4 weeks or Immobilization (≥ 3 days)	1.5
Previous DVT/PE (pulmonary embolism)	1.5
Hemoptysis	1
Malignancy	1
Clinical Probability	
Low probability of pulmonary embolus	0 – 1
Intermediate probability	2 – 6
High probability	≥ 7

Original and Simplified Geneva Score for Prediction of Pulmonary Embolism ^(2,5)

Clinical Criteria	Original Version	Simplified Version
Age $\geq$ 65 years	1	1
Previous DVT (deep vein thrombosis) or PE (pulmonary embolism)	3	1
Recent surgery or fracture (within 1 month)	2	1
Active malignant condition	2	1
Unilateral lower limb pain	3	1
Hemoptysis	2	1
Heart rate 75-94 bpm	3	1
Heart rate $\geq$ 95 bpm	5	2
Unilateral edema of lower limb and pain on deep palpation	4	1
Clinical Probability		
Low probability of Pulmonary Embolus (PE)	0 – 3	0 – 1
Intermediate probability	4 – 10	2 – 4
High probability	$\geq$ 11	$\geq$ 5

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease ⁽⁷⁾

Study Design: This document is a clinical practice guideline developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It includes recommendations based on a comprehensive literature review conducted from January 2021 to April 2021, with additional relevant studies considered through June 2022.

Target Population: The guidelines are intended for clinicians diagnosing and managing patients with aortic disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors:

- **Diagnosis and Management:** Recommendations cover genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance.
- **Imaging Techniques:** Various imaging techniques such as computed tomography, magnetic resonance imaging, echocardiography, and intravascular ultrasound are discussed.
- **Multidisciplinary Teams:** Emphasis on the importance of multidisciplinary aortic teams and shared decision-making.
- **Pregnancy:** Special considerations for managing aortic disease in pregnant patients.

2019 ESC Guidelines for the diagnosis and management of acute pulmonary embolism developed in collaboration with the European Respiratory Society (ERS) ⁽²⁾

Study Design: This document is a guideline developed by the European Society of Cardiology (ESC) in collaboration with the European Respiratory Society (ERS). It includes recommendations based on a thorough review of the literature and expert consensus.

Target Population: The guidelines are aimed at clinicians diagnosing and managing patients with acute pulmonary embolism (PE).

Key Factors:

- **Diagnosis:** Recommendations for various diagnostic tests, including D-dimer testing, computed tomographic pulmonary angiography (CTPA), and echocardiography.
- **Risk Assessment:** Detailed risk assessment strategies, including clinical parameters, imaging, and laboratory biomarkers.
- **Treatment:** Guidelines for acute-phase treatment, including anticoagulation, thrombolysis, and mechanical circulatory support.
- **Pregnancy:** Specific recommendations for managing PE in pregnant patients.
- **Long-term Management:** Strategies for chronic treatment and prevention of recurrence.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽⁸⁾

Study Design: This document is a guideline developed by the European Society of Cardiology (ESC) for the management of peripheral arterial and aortic diseases. It includes recommendations based on a comprehensive review of the literature and expert consensus.

Target Population: The guidelines are intended for clinicians managing patients with peripheral arterial and aortic diseases.

Key Factors:

- **Diagnosis:** Recommendations for various diagnostic tests, including duplex ultrasound, computed tomography angiography (CTA), and magnetic resonance angiography (MRA).
- **Screening:** Guidelines for screening for carotid, peripheral arterial, and aortic diseases.
- **Medical Treatment:** Recommendations for lifestyle changes, exercise, and pharmacological therapy.
- **Interventional Treatment:** Guidelines for revascularization and surgical interventions.
- **Follow-up:** Recommendations for follow-up after treatment of aortic aneurysms and acute aortic syndromes.
- **Genetic Diseases:** Specific recommendations for managing genetic and congenital diseases of the aorta.

ANALYSIS OF EVIDENCE

Shared Findings ^(2,7,8):

- All three guidelines emphasize the importance of accurate diagnosis and comprehensive management of cardiovascular diseases, including the use of advanced imaging techniques and multidisciplinary teams.
- They all provide specific recommendations for managing cardiovascular conditions in pregnant patients, highlighting the need for special considerations in this population.
- The guidelines stress the importance of long-term management and follow-up to prevent recurrence and manage chronic conditions.

Conclusion ^(2,7,8):

In summary, while all three guidelines share common themes of diagnosis, management, and long-term care, they each have a unique focus and provide specific recommendations tailored to their respective areas of cardiovascular disease.

POLICY HISTORY

Date	Summary
June 2025	● Guideline number changed from 022-2 to 2021 ● Guideline name changed from Chest MRA to Chest Magnetic Resonance Angiography (MRA) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Updated Pulmonary Embolism and Thoracic Aortic Disease sections ● Broke down Suspected Thoracic Aortic Disease section into screening criteria and abnormal imaging result or signs/symptoms ● Added Takayasu's Arteritis and Non-Central Horner's Syndrome indications in the Vascular Disease and Combination Studies sections ● Moved fibromuscular dysplasia (FMD) indication from Imaging in Known Genetic Condition section to Non-Aortic Vascular Disease section ● Standardized Preoperative and Postoperative Assessment sections ● Separated combination studies section for Genetic and Nongenetic conditions and updated accordingly ● Edited text for clarity and consistency ● Adjusted applicable lines of business – Medicare Advantage checked ● Updated Background section and references ● Added a Summary of Evidence and Analysis of Evidence
May 2024	● Updated references ● Added Genetics and Rare Diseases, Evaluation of Tumor, and Contraindications and Preferred Studies sections

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2016 for Cervical Spine Computed Tomography (CT)

Guideline Number: Evolent_CG_2016	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography (CT) is performed for the evaluation of the cervical spine. CT may be used as the primary imaging modality, or it may complement other modalities. Primary indications for CT include conditions, e.g., traumatic, neoplastic, and infectious. CT is often used to study the cervical spine for conditions such as degenerative disc disease when MRI is contraindicated. CT provides excellent depiction of bone detail and is used in the evaluation of known fractures of the cervical spine and for evaluation of postoperative patients.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months), one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow-up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR CERVICAL SPINE CT

Evaluation of Neurologic Deficits ^(1,2)

When Cervical Spine MRI is Contraindicated or cannot be performed

- With any of the following new neurological deficits documented on physical exam that localizes to the cervical spine:

- Extremity muscular weakness (not likely caused by plexopathy or peripheral neuropathy)
- Pathologic reflexes (e.g., Babinski, Lhermitte's sign, ⁽³⁾ Chaddock Sign, ⁽⁴⁾ Hoffman's and other upper motor neuron signs); **OR** abnormal deep tendon reflexes (not likely caused by plexopathy, or peripheral neuropathy)
- Absent/decreased sensation along a particular cervical dermatome (nerve distribution): pin prick, touch, vibration, proprioception, or temperature (and not likely caused by plexopathy or peripheral neuropathy)
- Upper or lower extremity increase muscle tone/spasticity
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- Suspected cord compression with any neurological deficits as listed above

Evaluation of Neck Pain ^(5,6)

With any of the Following when Cervical Spine MRI is Contraindicated

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment
Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute "inability to complete" treatment.
- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a cervical radiculopathy. ^(7,8)
- Isolated neck pain in pediatric population when at least **ONE** of the following red flags are present ^(9,10) (Note: conservative care is not required if red flags are present).
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination
 - Early morning stiffness and/or gelling
 - Night pain that prevents or disrupts sleep

- Radicular pain
- Fever, weight loss, or malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Suspected Myelopathy^(11,12)

When Cervical Spine MRI is Contraindicated

- Progressive symptoms including hand clumsiness, worsening handwriting, difficulty with grasping and holding objects, diffuse numbness in the hands, pins and needles sensation, increasing difficulty with balance and ambulation
- Any of the **neurological deficits** as noted above

NOTE: Does **NOT** require conservative care

Evaluation of Trauma or Acute Injury⁽¹³⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment***
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis) (Both MRI and CT are indicated)^(14,15)
- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or MRI) needing further evaluation
- When office notes specify that the C-spine cannot be clinical cleared because of a high-risk feature such as neurological deficit, midline spinal tenderness, altered mental status, high risk mechanism, unable to rotate neck as described in the NEXUS (National Emergency X-Radiography Utilization Study) or CCR (Canadian Cervical Rules) criteria for imaging⁽¹⁶⁾:
 - CT for initial imaging
 - MRI when suspect spinal cord or nerve root injury or when patient is obtunded, and CT is negative
 - CT or MRI for treatment planning of unstable spine⁽¹⁶⁾

Evaluation of Compression Fractures⁽¹⁷⁾

- To assess union of a fracture when physical examination, plain radiographs, or prior imaging suggest delayed or non-healing
- To determine the position of fracture fragments
- With history of malignancy
- Fracture on initial imaging in a young patient (<50) with no history of trauma and concern

for pathologic fracture

- Fracture with imaging characteristics concerning underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the CT will change management

CT Myelogram ^(1,18)

When MRI cannot be Performed/Contraindicated/Surgeon Preference

- When signs and symptoms inconsistent or not explained by the MRI findings
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁸⁾
- Surgical planning, especially regarding to the nerve roots or evaluation of dural sac
- Evaluation of suspected brachial plexus or nerve root injury in the neonate

Evaluation of Tumor, Cancer, or Metastasis

With any of the Following:

- **Primary tumor** ⁽¹⁹⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer
 - Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
 - With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ^(6,20)
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam
 - With an associated new focal **neurologic deficit** as above
 - Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or neck pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽²¹⁾

Evaluation of Known or Suspected Infection ⁽²²⁾

When Cervical Spine MRI is Contraindicated

E.g. Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or x-ray findings

Evaluation of Known or Suspected Inflammatory Disease or Atlantoaxial Instability ⁽²³⁾

When MRI is Contraindicated or for Surgical Treatment Planning

- Rheumatoid arthritis with neurologic signs/symptoms, or evidence of subluxation on x-ray (lateral x-ray in flexion and neutral should be the initial study) ^(24,25)
 - Patients with negative x-ray but symptoms suggestive of cervical instability or in patients with neurologic deficits
- High-risk disorders affecting the atlantoaxial articulation, (i.e. Down syndrome, Marfan syndrome with neurological signs/symptoms, abnormal neurological exam, or evidence of abnormal or inconclusive x-ray of the cervical spine ⁽²⁶⁾
- Spondyloarthropathies, known or suspected
 - Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms OR
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽²²⁾

When Cervical Spine MRI is Contraindicated

E.g., HIV, chemotherapy, leukemia, or lymphoma

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

When MRI is Contraindicated or Cannot be Performed

Note: See combination requests, below, for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected), based on preliminary

imaging, neurological exam, and/or high-risk cutaneous stigmata ^(27,28)

- Known Arnold-Chiari syndrome (For **initial imaging** (one-time initial assessment) see combination below)
- Known Chiari I malformation without syrinx or hydrocephalus, follow-up imaging after initial diagnosis with new or changing signs/symptoms or exam findings consistent with spinal cord pathology ⁽²⁹⁾
- Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation
- Syrinx or syringomyelia (known or suspected) ⁽³⁰⁾
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis)
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
- Toe walking in a child with signs/symptoms of myelopathy (upper motor neuron signs/hyperreflexia) localized to the Cervical Spine ⁽³¹⁾
- Initial evaluation of trigeminal neuralgia not explained on recent Brain imaging
- Horner's syndrome with symptoms localizing the lesion to the cervical spine (radicular signs) ^(32,33)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- CT discogram
- Imaging of area requested is needed to develop a surgical plan (no contraindication to MRI required if ordered by a neurosurgeon or orthopedic surgeon)

Postoperative Evaluation:

- Evaluation of post operative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays (a contraindication to MRI is not needed)
NOTE: CT for this indication, advanced imaging should not occur until > 6 months after surgery
- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings when MRI is contraindicated or cannot be performed
- New or changing neurological deficits or symptoms post-operatively ⁽³⁴⁾ (see **neurological deficit** section above) when MRI is contraindicated or cannot be performed
- Known or suspected complications

- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification. When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding.
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam). When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding.

IMAGING IN KNOWN GENETIC CONDITIONS

- Down Syndrome ⁽³⁵⁾:
 - With signs or symptoms suggestive of possible atlantoaxial instability (such as neck pain, neck stiffness, head tilt, gait changes, radicular pain or a new onset neurologic deficit)

OTHER COMBINATION STUDIES WITH CERVICAL SPINE CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Cervical Spine MRI and Cervical Spine CT

- OPLL (Ossification of posterior longitudinal ligament) ⁽³⁶⁾
- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Unstable craniocervical junction
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Cervical Spine/Thoracic Spine CT

When MRI is contraindicated or CANNOT be performed or surgeon preference

- Initial evaluation of known or suspected syrinx or syringomyelia ⁽³⁰⁾
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis)
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or CANNOT be performed or surgeon preference

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ⁽³²⁾
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁹⁾
 - Drop metastasis from brain or spine (CT spine imaging in this scenario is usually CT myelogram) see background
 - Suspected leptomeningeal carcinomatosis (see background)
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁸⁾

Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or CANNOT be performed or surgeon preference

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(37,38) (e.g., congenital scoliosis, idiopathic scoliosis, scoliosis with vertebral anomalies)
- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(39,40)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(39,41):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)

- Early onset
- Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)
- Pre-operative planning
- When office notes clearly document how imaging will change management
- Arnold-Chiari malformations ^(28,42)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ^(29,43)
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽⁴³⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ^(27,28,43) when anesthesia required for imaging ⁽⁴⁴⁾ (e.g., meningocele, lipomeningocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁹⁾
 - Drop metastasis from brain or spine (imaging also includes brain; CT spine imaging in this scenario is usually CT myelogram)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽⁴⁵⁾
 - Any combination of these for spinal survey in patient with metastases
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁸⁾
- CT myelogram when meets above guidelines and MRI is contraindicated or for surgical planning
- Post-procedure (discogram) CT

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine

CODING AND STANDARDS

Codes

72125, 72126, 72127, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region.

Active Modalities

- Physical therapy
- Physician-supervised home exercise program**
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections (e.g., epidural injection, selective nerve root block)
- Medical Devices (e.g., TENS unit, bracing)

**Home Exercise Program

The following two elements are required to meet conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g.,

increased pain or inability to physically perform exercises).

Cervical Myelopathy

Symptom severity varies, and a high index of suspicion is essential for making the proper diagnosis in early cases. Symptoms of pain and radiculopathy may not be present. The natural history of myelopathy is characterized by neurological deterioration. The most frequently encountered symptom is gait abnormality (86%) followed by increased muscular reflexes (79.1%), pathological reflexes (65.1%), paresthesia of upper limb (69.8%) and pain (67.4%). ⁽¹¹⁾

NEXUS Criteria for C-Spine Imaging ⁽⁴⁶⁾

Clears patients from cervical spine fracture clinically, without imaging when none of the following are present

- Focal neurologic deficit present
- Midline spinal tenderness present
- Altered level of consciousness present
- Intoxication present
- Distracting injury present

Canadian C-Spine Rule ⁽⁴⁷⁾

Clinically clears cervical spine fracture without imaging in alert, stable trauma patients.

With all of the following:

- Low risk factor present
 - Sitting position in the ED, ambulatory at any time, delayed (not immediate onset) neck pain, no midline tenderness. Simple rear-end motor vehicle collision (MVC) (not simple if pushed into traffic, hit by bus/large truck, rollover, hit by high-speed vehicle)**AND**
- Able to actively rotate neck 45° left and right **AND**
- None of the following high-risk factors
 - Age ≥65 years
 - Extremity paresthesia's
 - Dangerous mechanism (e.g., fall from ≥3 ft (0.9 m) / 5 stairs, axial load injury, high speed MVC/rollover/ejection, bicycle collision, motorized recreational vehicle)

Gait and Spine Imaging

Table 1 ^(48–51)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging

Gait	Characteristic	Work up/Imaging
		based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines
Sensory ataxic	Cautious, stomping, worsening without visual input (ie + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

CT Myelogram

Myelography is the instillation of intrathecal contrast media under fluoroscopy. Patients are then imaged with CT to evaluate for spinal canal pathology. Although this technique has diminished greatly due to the advent of MRI due to its non-invasiveness and superior soft-tissue contrast, myelography is still a useful technique for conventional indications, such as spinal stenosis, when MRI is contraindicated or nondiagnostic or surgeon preference (see guidelines above), brachial plexus injury in neonates, radiation therapy treatment planning, and cerebrospinal fluid (CSF) leak. ⁽⁵²⁾

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Diagnosis and Treatment of Cervical Radiculopathy from Degenerative Disorders ⁽¹⁾

Study Design: The document outlines the development of clinical guidelines by the North American Spine Society (NASS) for the diagnosis and treatment of cervical radiculopathy from degenerative disorders. The guidelines were developed through a systematic review of the literature and expert consensus. The methodology included a comprehensive literature search, evidence analysis, and formulation of evidence-based recommendations.

Target Population: The guidelines are intended for adult patients (18 years or older) with a chief complaint of pain in a radicular pattern in one or both upper extremities related to compression and/or irritation of one or more cervical nerve roots. The target population includes patients with varying degrees of sensory, motor, and reflex changes, as well as dysesthesias and paresthesias related to nerve root(s) without evidence of spinal cord dysfunction (myelopathy).

Key Factors:

1. **Objective:** To provide evidence-based recommendations for the diagnosis and treatment of cervical radiculopathy from degenerative disorders.
2. **Scope and Purpose:** The guidelines aim to assist practitioners in improving the quality and efficiency of care delivered to patients with cervical radiculopathy from degenerative disorders.
3. **Methodology:** The guidelines were developed through multidisciplinary collaboration, evidence analysis training, disclosure of potential conflicts of interest, and standardized levels of evidence and grades of recommendation.
4. **Recommendations:**
 - **Diagnosis/Imaging:** Suggested diagnostic tests include MRI, CT, and CT myelography. Provocative tests such as the shoulder abduction and Spurling's tests may be considered.
 - **Outcome Measures:** Recommended outcome measures include the Neck Disability Index (NDI), SF-36, SF-12, and Visual Analog Scale (VAS).
 - **Medical/Interventional Treatment:** The role of pharmacological treatment, physical therapy/exercise, manipulation/chiropractics, epidural steroid injections,

and ancillary treatments such as bracing, traction, electrical stimulation, acupuncture, and TENS are discussed.

- **Surgical Treatment:** Various surgical options are compared, including anterior cervical decompression with fusion (ACDF), anterior cervical decompression alone (ACD), anterior cervical decompression and fusion with instrumentation (ACDFI), and posterior decompression with or without fusion.

ACR Appropriateness Criteria® Cervical Pain or Cervical Radiculopathy ⁽⁶⁾

Study Design: The study design involves a systematic review of literature and expert panel recommendations to establish guidelines for imaging procedures in various clinical scenarios related to cervical pain and radiculopathy. The criteria are revised periodically to incorporate new evidence and advancements in imaging technology.

Target Population: The target population includes adults experiencing cervical pain or cervical radiculopathy. The document addresses different clinical scenarios such as acute or increasing cervical pain without radiculopathy, acute or increasing cervical pain with radiculopathy, prior cervical spine surgery, suspected or known infection, diagnosis of malignancy, suspected cervicogenic headache, chronic cervical pain without radiculopathy, and chronic cervical pain with radiculopathy.

Key Factors

Imaging Procedures: The document categorizes imaging procedures based on their appropriateness for different clinical scenarios. Procedures include radiography, MRI, CT, CT myelography, MRA, bone scan, FDG-PET/CT, and others.

Relative Radiation Levels: Each imaging procedure is assessed for its relative radiation level, indicating the potential adverse health effects associated with radiation exposure.

Clinical Scenarios: The criteria provide specific recommendations for initial imaging based on the presence or absence of trauma, "red flag" symptoms, and other clinical indicators.

Expert Panel: The guidelines are developed by an expert panel consisting of radiologists, neurologists, orthopedic surgeons, and other specialists from various institutions.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽¹³⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ANALYSIS OF EVIDENCE

Shared Findings:

Diagnosis and Imaging: All three articles emphasize the importance of imaging in diagnosing cervical spine conditions. "Bono et al 2010" discusses the use of MRI and CT for diagnosing cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" provides detailed appropriateness criteria for various imaging modalities in different scenarios of cervical pain and radiculopathy. ⁽⁶⁾ "Hassankhani et al 2024" highlights the role of CT and MRI in acute spinal trauma. ⁽¹³⁾

Clinical Guidelines: The articles stress the need for evidence-based clinical guidelines. "Bono et al 2010" outlines the North American Spine Society's guidelines for diagnosing and treating cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" presents the American College of Radiology's appropriateness criteria for imaging cervical pain and radiculopathy. ⁽⁶⁾ "Hassankhani et al 2024" discusses the ACR's guidelines for imaging acute spinal trauma. ⁽¹³⁾

Role of MRI: MRI is consistently recommended across all articles for its superior ability to visualize soft tissue abnormalities. "Bono et al 2010" mentions MRI's role in diagnosing cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" lists MRI as appropriate for various cervical pain scenarios. ⁽⁶⁾ "Hassankhani et al 2024" emphasizes MRI's importance in detecting ligamentous, spinal cord, or nerve root injuries. ⁽¹³⁾

POLICY HISTORY

Date	Summary
June 2025	- Guideline name changed from Cervical Spine CT to Cervical Spine Computed Tomography (CT) - Guideline number changed from Evolent CG 041 to Evolent

Date	Summary
	CG 2016 • Added new bullet-point to the General Statement section • Checked the Medicare Advantage box in the Applicable Lines of Business table • Added a Summary of Evidence and Analysis of Evidence • Updated references and background • Clarified trauma imaging criteria • Evaluation of Compression Fractures ○ Added ■ Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture ■ Fracture with imaging characteristics concerning for underlying malignancy • Clarified Horner's syndrome
June 2024	• Aligned Combinations Studies across guidelines • Added Contraindications and Preferred Studies section • Reduced background section • Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2056 for Thoracic Spine Computed Tomography (CT)

Guideline Number: Evolent_CG_2056	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography is used for the evaluation, assessment of severity, and follow-up of diseases of the spine. CT may be used for conditions, e.g., degenerative changes, infection, and immune suppression, when magnetic resonance imaging (MRI) is contraindicated. It may also be used in the evaluation of tumors, cancer, or metastasis in the thoracic spine, and it may be used for preoperative and post-surgical evaluations. CT is fast and is often performed in acute settings and provides good visualization of cortical bone.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months), one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow-up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient (the entire spinal cord and/or autonomic postganglionic chain must be assessed).

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR THORACIC SPINE CT

Evaluation of Neurologic Deficits ⁽¹⁾

When Thoracic Spine MRI is Contraindicated or cannot be performed

- With any of the following new neurological deficits documented on physical exam that

localizes to the thoracic spine

- Extremity muscular weakness (and not likely caused by plexopathy or peripheral neuropathy)
- Pathologic reflexes (e.g., Babinski, Lhermitte's sign, ⁽²⁾ Chaddock Sign, ⁽³⁾ Hoffman's and other upper motor neuron signs); **OR** abnormal deep tendon reflexes (and not likely caused by plexopathy, or peripheral neuropathy)
- Absent/decreased sensation along a particular thoracic dermatome (nerve distribution): pin prick, touch, vibration, proprioception, or temperature (and not likely caused by plexopathy, or peripheral neuropathy)
- Upper or lower extremity increase muscle tone/spasticity
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- Suspected thoracic cord compression with any neurological deficits as listed above

Evaluation of Back Pain ⁽¹⁾

With any of the following when Thoracic Spine MRI is Contraindicated

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment

Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute "inability to complete" treatment.

- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a thoracic radiculopathy. ^(4,5)
- Isolated back pain in pediatric population when at least ONE of the following red flags are present ^(6,7) (Note: conservative care not required if red flags are present)
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination
 - Early morning stiffness and/or gelling

- Night pain that prevents or disrupts sleep
- Radicular pain
- Fever, weight loss, malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Suspected Myelopathy ^(8,9)

When Thoracic Spine MRI is Contraindicated

- Progressive symptoms including unsteadiness; broad-based gait; increased muscle tone; pins and needles sensation; weakness and wasting of the lower limbs; diminished sensation to light touch, temperature, proprioception, and vibration; limb hyperreflexia and pathologic reflexes; bowel and bladder dysfunction in more severe cases
- Any of the **neurological deficits** as noted above

NOTE: Does **NOT** require conservative care

Evaluation of Trauma or Acute Injury ⁽¹⁰⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment***
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis) (Both MRI and CT are approvable) ^(11–13)
- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or MRI) needing further evaluation

Evaluation of Compression Fractures ⁽¹⁴⁾

- To assess union of a fracture when physical examination, plain radiographs, or prior imaging suggest delayed or non-healing
- To determine the position of fracture fragments
- With history of malignancy
- Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture
- Fracture with imaging characteristics concerning underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the CT will change management

CT Myelogram ⁽¹⁵⁾

When MRI cannot be Performed/Contraindicated/Surgeon Preference

- When signs and symptoms inconsistent or not explained by the MRI findings
- CSF leak highly suspected and supported by patient history exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁵⁾
- Surgical planning, especially regarding to the nerve roots or evaluation of dural sac

Evaluation of Tumor, Cancer, or Metastasis

With any of the Following:

- **Primary tumor** ⁽¹⁶⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer
 - Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
 - With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ⁽¹⁷⁾
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam
 - With an associated new focal **neurologic deficit** as above
 - Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or back pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽¹⁸⁾

Evaluation of Known or Suspected Infection ⁽¹⁹⁾

When Thoracic Spine MRI is Contraindicated or cannot be performed

E.g., Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or radiographic findings

Evaluation of Known or Suspected Inflammatory Disease

- Spondyloarthropathies, known or suspected
 - Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms OR
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽¹⁹⁾

E.g., HIV, chemotherapy, leukemia, or lymphoma

When Thoracic Spine MRI is Contraindicated

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

When MRI is Contraindicated or Cannot be Performed

Note: See **combination requests** below for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata ^(20,21)
- Known Arnold-Chiari syndrome (For **initial imaging** (one-time initial assessment) see **combination** below)
 - Known Chiari I malformation without syrinx or hydrocephalus, follow-up imaging after initial diagnosis with new or changing signs/symptoms or exam findings consistent with spinal cord pathology ⁽²²⁾
 - Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation
- Syrinx or syringomyelia (known or suspected) ⁽²³⁾
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis)
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
- Toe walking in a child with signs/symptoms of myelopathy (upper motor neuron signs/hyperreflexia) localized to the thoracic spine

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT ⁽¹⁾

When not otherwise specified in the guideline:

Preoperative Evaluation:

- CT discogram
- Prior to spinal cord stimulator to exclude canal stenosis if no prior imaging of the thoracic spine has been done recently and MRI is contraindicated or cannot be performed
- Imaging of the area requested is needed to develop a surgical plan (no contraindication to MRI required if ordered by a neurosurgeon or orthopedic surgeon)

Postoperative Evaluation:

- Evaluation of post operative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays (a contraindication to MRI is not needed)
 - **NOTE:** for this indication, advanced imaging should not occur until > 6 months after surgery
- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings and MRI is contraindicated or cannot be performed
- New or changing neurological deficits or symptoms post-operatively ⁽¹¹⁾ (see **neurological deficit** section above) and MRI is contraindicated or cannot be performed
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification. When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding.
- One follow-up exam of a prior indeterminate MRI/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam). (When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding).

OTHER COMBINATION STUDIES WITH THORACIC SPINE CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Thoracic Spine MRI and Thoracic Spine CT

- OPLL (Ossification of posterior longitudinal ligament) ⁽²⁴⁾
- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Unstable craniocervical junction
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Cervical Spine/Thoracic Spine CT

When MRI is Contraindicated or CANNOT be performed or surgeon preference

- Initial evaluation of known or suspected syrinx or syringomyelia
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis) ⁽²³⁾
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or CANNOT be performed or surgeon preference

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(20,25–27)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁶⁾
 - Drop metastasis from brain or spine (CT spine imaging in this scenario is usually CT myelogram) see background
 - Suspected leptomeningeal carcinomatosis (see background) ⁽²⁸⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁵⁾

Cervical Spine/Thoracic Spine/Lumbar Spine CTs

When MRI is contraindicated or CANNOT be performed or surgeon preference

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(29,30) (e.g., congenital scoliosis, idiopathic scoliosis, scoliosis with vertebral anomalies)
- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(31,32)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(32,33):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)
 - Early onset
 - Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)
 - Pre-operative planning
 - When office notes clearly document how imaging will change management
- Arnold-Chiari malformations ^(20,34)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ^(22,35)
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽³⁵⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ^(20,21,35) when anesthesia required for imaging ⁽³⁶⁾ (e.g., meningocele, lipomenocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁶⁾
 - Drop metastasis from brain or spine (imaging also includes brain; CT spine imaging in this scenario is usually CT myelogram)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽³⁷⁾
 - Any combination of these for spinal survey in patient with metastases
 - Known tumor evaluation and monitoring in neurocutaneous syndromes

- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁵⁾
- CT myelogram when meets above guidelines and MRI is contraindicated or for surgical planning
- Post-procedure (discogram) CT

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72128, 72129, 72130, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region.

Active Modalities

- Physical therapy
- Physician-supervised home exercise program**
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections (e.g., epidural injection, selective nerve root block)
- Medical Devices (e.g., TENS unit, bracing)

****Home Exercise Program**

The following two elements are required to meet conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g., increased pain or inability to physically perform exercises).

Gait and Spine Imaging

Table 1 ^(38–41)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines

Gait	Characteristic	Work up/Imaging
Sensory ataxic	Cautious, stomping, worsening without visual input (ie + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Thoracic Back Pain ⁽¹⁾

Study Design: The document is a guideline developed by the ACR Expert Panel on Neurological Imaging. It reviews the appropriateness of various imaging procedures for different clinical scenarios involving thoracic back pain (TBP). The guidelines are based on a thorough literature review and expert consensus.

Target Population: The target population includes adults with thoracic back pain, categorized into several variants:

1. Acute thoracic back pain without myelopathy or radiculopathy and no red flags.
2. Subacute or chronic thoracic back pain without myelopathy or radiculopathy and no red flags.
3. Thoracic back pain with myelopathy or radiculopathy.
4. Thoracic back pain with one or more of the following: low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.
5. Thoracic back pain with suspicion of cancer, infection, or immunosuppression.

6. Thoracic back pain with radiographic evidence of bone destruction, fracture, or spinal deformity.
7. Thoracic back pain post-thoracic spine surgery.

Key Factors

- **Imaging Procedures:** The document evaluates the appropriateness of various imaging modalities such as radiography, MRI, CT, bone scans, and FDG-PET/CT for each clinical scenario.
- **Radiation Levels:** It provides relative radiation levels for each imaging procedure to help assess the risk-benefit ratio.
- **Clinical Scenarios:** Each variant is discussed in detail, providing recommendations for initial imaging and follow-up based on the presence of specific clinical features and risk factors.
- **Expert Consensus:** The guidelines are developed through collaboration with various experts and organizations, ensuring a comprehensive and balanced approach.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽¹⁰⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ACR Appropriateness Criteria® Management of Vertebral Compression Fractures: 2022 Update ⁽¹⁴⁾

Study Design: The study design involves the development and revision of the ACR Appropriateness Criteria, which are evidence-based guidelines for specific clinical conditions. These guidelines are reviewed annually by a multidisciplinary expert panel. The guideline development includes an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies such as the RAND/UCLA Appropriateness Method and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population for this study includes individuals with vertebral compression fractures, which can be caused by various etiologies such as trauma, osteoporosis, or neoplastic infiltration. Osteoporosis-related fractures are the most common cause of VCFs and have a high prevalence among postmenopausal women and similarly aged men. The study also addresses VCFs caused by trauma and malignancies, including primary bone tumors and metastatic cancers.

Key factors:

- The prevalence and causes of VCFs, highlighting the high incidence among postmenopausal women and the increasing incidence in men.
- The importance of diagnostic imaging in characterizing VCFs and guiding treatment decisions.
- The use of various imaging modalities such as MRI, CT, FDG-PET/CT, and bone scans to evaluate VCFs.
- The management of both osteoporotic and pathologic VCFs, including medical management, percutaneous vertebral augmentation, and surgical consultation.
- The role of minimally invasive percutaneous image-guided techniques for treating spine tumors and the potential benefits of vertebral augmentation procedures.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,10,14):

Imaging Techniques: All three articles emphasize the importance of imaging techniques in diagnosing and managing spinal conditions. They discuss various imaging modalities such as MRI, CT, and bone scans. MRI is frequently highlighted as the preferred imaging modality due to its ability to provide detailed soft tissue resolution and assess spinal canal patency.

Role of MRI: MRI is recommended for evaluating spinal conditions, particularly for identifying marrow replacing lesions, osseous destruction, canal compromise, and cord signal abnormalities. MRI with and without IV contrast is suggested for cases with suspected neoplasm, infection, or inflammation.

CT Imaging: CT is recognized for its high-resolution depiction of osseous structures and is useful for preoperative planning and assessing hardware integrity. CT myelography is mentioned as a complementary imaging technique, particularly for presurgical or preradiation treatment planning.

POLICY HISTORY

Date	Summary
June 2025	● Guideline name changed from Thoracic Spine CT to Thoracic Spine Computed Tomography (CT) ● Guideline number changed from Evolent CG 043 to Evolent CG 2056 ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references and background ● Updated the Genetics and Rare Diseases section ● Added ○ Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture ○ Fracture with imaging characteristics concerning for underlying malignancy
June 2024	● Aligned Combination Studies across guidelines ● Added Contraindications and Preferred Studies section ● Reduced Background Section ● Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2036 for Lumbar Spine Computed Tomography (CT)

Guideline Number: Evolent_CG_2036	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography is used for the evaluation, assessment of severity, and follow-up of diseases of the spine. CT is often used to study the lumbar spine for conditions such as degenerative disc disease when MRI is contraindicated. CT provides excellent depiction of bone detail and is used in the evaluation of known fractures of the lumbar spine and for evaluation of postoperative patients.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR LUMBAR SPINE CT

Evaluation of Neurologic Deficits ⁽¹⁾

When Lumbar Spine MRI is Contraindicated or Cannot be performed

- With any of the following new neurological deficits documented on physical exam that localizes to the lumbar spine

- Extremity muscular weakness (not likely caused by plexopathy, peripheral neuropathy or neuromuscular disease)
- Pathologic abnormal reflexes (not likely caused by plexopathy, peripheral neuropathy, or neuromuscular disease)
- Absent/decreased sensation along a particular lumbar dermatome (nerve distribution): pin prick, touch, vibration, proprioception, or temperature (and not likely caused by plexopathy, or peripheral neuropathy)
- Lower extremity decreased muscle tone (not likely caused by plexopathy, peripheral neuropathy or neuromuscular disease)
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- New onset foot drop (not related to a peripheral nerve injury, e.g., peroneal nerve)
- Cauda Equina Syndrome as evidence by severe back pain/sciatica along with one of the defined symptoms (see **Cauda Equina Syndrome** section)

Evaluation of Back Pain ⁽¹⁾

With any of the following when Lumbar Spine MRI is Contraindicated

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment

Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute “inability to complete” treatment.

- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a lumbar radiculopathy. ^(2,3)
- Isolated back pain in pediatric population when at least ONE of the following red flags are present ^(4,5) (Note: conservative care not required if red flags are present).
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination

- Early morning stiffness and/or gelling
- Night pain that prevents or disrupts sleep
- Radicular pain
- Fever, weight loss, or malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Trauma or Acute Injury ⁽⁶⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment**
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis or diffuse idiopathic skeletal hyperostosis) (Both MRI and CT are approvable) ⁽⁷⁾
- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or MRI) needing further evaluation

Pars Defect (Spondylolysis) or Spondylolisthesis

- Pars defect (spondylolysis) or spondylolisthesis in adults when Flexion/Extension x-rays show instability ⁽⁸⁾
- Clinically suspected pars defect (spondylolysis) after plain films (flexion extension instability not required) in pediatric population (< 18 yr.), or athletes and imaging would change treatment ⁽⁴⁾ when MRI is contraindicated/cannot be performed or surgeon preference

Evaluation of Compression Fractures ⁽⁹⁾

- To assess union of a fracture when physical examination, plain radiographs, or prior imaging suggest delayed or non-healing
- To determine the position of fracture fragments
- With history of malignancy
- Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture
- Fracture with imaging characteristics concerning for underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the CT will change management

CT Myelogram (10,11)

When MRI cannot be Performed/Contraindicated/Surgeon Preference

- When signs and symptoms are inconsistent or not explained by the MRI findings
- Demonstration of the site of a CSF leak (known or suspected spontaneous (idiopathic) intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula)
- Surgical planning, especially regarding the nerve roots or evaluation of dural sac

Evaluation of Tumor, Cancer, or Metastasis

With any of the Following:

- **Primary tumor** ⁽¹²⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer
 - Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
 - With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ⁽¹³⁾
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam
 - With an associated new focal **neurologic deficit**
 - Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or back pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽¹⁴⁾

Evaluation of Known or Suspected Infection ⁽¹⁵⁾

When Lumbar Spine MRI is contraindicated

E.g. Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or x-ray findings

Evaluation of Known or Suspected Inflammatory Disease

- Spondyloarthropathies, known or suspected

- Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms OR
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽¹⁵⁾

When Lumbar Spine MRI is Contraindicated or Cannot be performed

E.g., HIV, chemotherapy, leukemia, or lymphoma

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

When MRI is Contraindicated or Cannot be Performed

Note: See combination requests, below, for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected), based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata ^(16,17)
- Known anorectal malformations ⁽¹⁸⁾
- Suspicious sacral dimple (those that are deep, larger than 0.5 cm, located within the superior portion of the gluteal crease or above the gluteal crease, multiple dimples, or associated with other cutaneous markers) or duplicated or deviated gluteal cleft ⁽¹⁹⁾
 - Patients ≤ 3 months should have ultrasound
- Toe walking in a child when associated with upper motor neuron signs, including hyperreflexia, spasticity; or orthopedic deformity with concern for tethered cord (e.g., pes cavus, clawed toes, leg, or foot length deformity (excluding tight heel cords)) ⁽²⁰⁾
- Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation ⁽¹⁷⁾
- For follow-up/repeat evaluation of Arnold-Chiari I with new signs or symptoms suggesting recurrent spinal cord tethering (For initial diagnosis see Combinations section below)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative evaluation:

- CT discogram
- Imaging of the area requested is needed to develop a surgical plan (no contraindication to MRI required if ordered by a neurosurgeon or orthopedic surgeon)

Postoperative Evaluation:

- Evaluation of post operative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays (a contraindication to MRI is not needed)

NOTE: For this indication, advanced imaging should not occur until > 6 months after surgery

- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings when MRI is contraindicated or cannot be performed
- New or changing neurological deficits or symptoms post-operatively ⁽²¹⁾ (see **neurological deficit** section above) when MRI is contraindicated or cannot be performed
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification. When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding.
- One follow-up exam of a prior indeterminate MRI/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam). (When MRI cannot be performed, is contraindicated, or CT is preferred to characterize the finding).

OTHER COMBINATION STUDIES WITH LUMBAR SPINE CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Lumbar Spine MRI and Lumbar Spine CT

- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or cannot be performed or surgeon preference:

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(17,22–24)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹²⁾
 - Drop metastasis from brain or spine (CT spine imaging in this scenario is usually CT myelogram) see **Background**
 - Suspected leptomeningeal carcinomatosis ⁽²⁵⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁰⁾

Cervical Spine/Thoracic Spine/Lumbar Spine CT

When MRI is contraindicated or cannot be performed or surgeon preference:

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(26,27) (e.g., congenital scoliosis, idiopathic scoliosis, scoliosis with vertebral anomalies)
- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(28,29)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(29,30):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)
 - Early onset
 - Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)

- Pre-operative planning
- When office notes clearly document how imaging will change management
- Arnold-Chiari malformations ^(17,31)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ^(32,33)
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽³³⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ^(16,17,33) when anesthesia required for imaging ⁽³⁴⁾ (e.g., meningocele, lipomeningocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹²⁾
 - Drop metastasis from brain or spine (imaging also includes brain; CT spine imaging in this scenario is usually CT myelogram)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽³⁵⁾
 - Any combination of these for spinal survey in patient with metastases
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽¹⁰⁾
- CT myelogram when meets above guidelines and MRI is contraindicated or for surgical planning
- Post-procedure (discogram) CT

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72131, 72132, 72133, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region.

- **Active Modalities**
 - Physical therapy
 - Physician-supervised home exercise program**
 - Chiropractic care
- **Inactive Modalities**
 - Medications (e.g., NSAIDs, steroids, analgesics)
 - Injections (e.g., epidural injection, selective nerve root block)
 - Medical Devices (e.g., TENS unit, bracing)

**Home Exercise Program

The following elements are required to meet for conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g., increased pain or inability to physically perform exercises).

Gait and Spine Imaging

Table 1 (36–39)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines
Sensory ataxic	Cautious, stomping, worsening without visual input (ie + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

CT Myelogram

Myelography is the instillation of intrathecal contrast media under fluoroscopy. Patients are then imaged with CT to evaluate for spinal canal pathology. Although this technique has diminished greatly due to the advent of MRI due to its non-invasiveness and superior soft-tissue contrast, myelography is still a useful technique for conventional indications, such as spinal stenosis,

when MRI is contraindicated, nondiagnostic, or surgeon preference (see guidelines above), brachial plexus injury in neonates, radiation therapy treatment planning, and cerebrospinal fluid (CSF) leak.

Cauda Equina Syndrome

- Symptoms include severe back pain or sciatica along with one or more of the following:
 - Saddle anesthesia — loss of sensation restricted to the area of the buttocks, perineum and inner surfaces of the thighs (areas that would sit on a saddle).
 - Recent bladder/bowel dysfunction
 - Achilles reflex absent on both sides
 - Sexual dysfunction that can come on suddenly
 - Absent anal reflex and bulbocavernosus reflex
- This is a “Red Flag” situation and Lumbar Spine MRI is approvable.

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Low Back Pain: 2021 Update ⁽¹⁾

Study Design: The study is an update of the ACR Appropriateness Criteria for low back pain, developed by the Expert Panel on Neurological Imaging. The criteria are evidence-based guidelines for specific clinical conditions, reviewed annually by a multidisciplinary expert panel. The guideline development and revision include an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies (RAND/UCLA Appropriateness Method and Grading of Recommendations Assessment, Development, and Evaluation or GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population includes patients in the United States with acute low back pain, with or without radiculopathy. Acute low back pain is the leading cause of years lived with disability and the third-ranking cause of disability-adjusted life-years in the United States. The criteria address various scenarios, including uncomplicated acute low back pain, subacute or chronic low back pain, low back pain with suspected cauda equina syndrome, low back pain with a history of prior lumbar surgery, and low back pain with one or more risk factors such as low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.

Key Factors

Imaging Recommendations: The criteria provide detailed recommendations on the appropriateness of various imaging procedures for different clinical scenarios. For example, imaging is typically not warranted for acute uncomplicated low back pain, while MRI is recommended for patients with suspected cauda equina syndrome or those who are candidates for surgery or intervention with persistent or progressive symptoms.

Clinical Scenarios: The document outlines seven variants of low back pain and provides specific imaging recommendations for each variant. These include acute low back pain with or without radiculopathy, subacute or chronic low back pain, low back pain with suspected cauda equina syndrome, low back pain with a history of prior lumbar surgery, and low back pain with risk factors such as low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.

Radiation Levels: The criteria also include relative radiation level designations for each imaging examination, providing information on potential adverse health effects associated with radiation exposure.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽⁶⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ACR Appropriateness Criteria® Management of Vertebral Compression Fractures: 2022 Update ⁽⁹⁾

Study Design: The study design involves the development and revision of the ACR

Appropriateness Criteria, which are evidence-based guidelines for specific clinical conditions. These guidelines are reviewed annually by a multidisciplinary expert panel. The guideline development includes an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies such as the RAND/UCLA Appropriateness Method and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population for this study includes individuals with vertebral compression fractures, which can be caused by various etiologies such as trauma, osteoporosis, or neoplastic infiltration. Osteoporosis-related fractures are the most common cause of VCFs and have a high prevalence among postmenopausal women and similarly aged men. The study also addresses VCFs caused by trauma and malignancies, including primary bone tumors and metastatic cancers.

Key factors:

- The prevalence and causes of VCFs, highlighting the high incidence among postmenopausal women and the increasing incidence in men.
- The importance of diagnostic imaging in characterizing VCFs and guiding treatment decisions.
- The use of various imaging modalities such as MRI, CT, FDG-PET/CT, and bone scans to evaluate VCFs.
- The management of both osteoporotic and pathologic VCFs, including medical management, percutaneous vertebral augmentation, and surgical consultation.
- The role of minimally invasive percutaneous image-guided techniques for treating spine tumors and the potential benefits of vertebral augmentation procedures.

ANALYSIS OF EVIDENCE

Shared Findings

Imaging Recommendations: All three articles emphasize the importance of imaging in diagnosing and managing spinal conditions. They recommend using MRI and CT scans as primary imaging modalities due to their high sensitivity and specificity in detecting spinal injuries and abnormalities. For instance, "Hassankhani et al 2024 ACR Acute Spinal Trauma" highlights the use of CT and MRI for acute spinal trauma, while "Hutchins et al 2021 JACR Low Back Pain" and "Khan et al 2023 JACR Management of Vertebral Compression Fractures" also stress the importance of these imaging techniques for low back pain and vertebral compression fractures, respectively. ^(1,6,9)

Clinical Criteria and Guidelines: The articles provide evidence-based guidelines and criteria for managing spinal conditions. "Hassankhani et al 2024 ACR Acute Spinal Trauma" discusses the use of the National Emergency X-Radiography Utilization Study (NEXUS) and the Canadian C-Spine Rule (CCR) for cervical spine injuries. ⁽⁶⁾ Similarly, "Hutchins et al 2021 JACR Low Back Pain" outlines the American College of Radiology Appropriateness Criteria for low back pain management. ⁽¹⁾ "Khan et al 2023 JACR

Management of Vertebral Compression Fractures" provides guidelines for managing vertebral compression fractures, including the use of the Spinal Instability Neoplastic Score (SINS) for evaluating spinal stability. ⁽⁹⁾

Non-Surgical Management: All three articles emphasize the importance of non-surgical management as the first line of treatment. They recommend conservative therapies such as pain management, physical therapy, and bracing before considering surgical interventions. For example, "Hutchins et al 2021 JACR Low Back Pain" and "Khan et al 2023 JACR Management of Vertebral Compression Fractures" both highlight the role of conservative management in treating low back pain and vertebral compression fractures. ^(1,9)

POLICY HISTORY

Date	Summary
June 2025	- Guideline name changed from Lumbar Spine CT to Lumbar Computed Tomography (CT) - Guideline number changed from Evolent CG 045 to Evolent CG 2036 - Added new bullet-point to the General Statement section - Checked the Medicare Advantage box in the Applicable Lines of Business table - Added a Summary of Evidence and Analysis of Evidence - Updated references and background - Clarified neurological deficit - Evaluation of Compression Fractures Added - Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture - Fracture with imaging characteristics concerning for underlying malignancy
June 2024	- Aligned Combination Studies across guidelines - Added Contraindications and Preferred Studies section - Reduced background - Updated References

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2017 for Cervical Spine Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2017	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance imaging (MRI) produces high quality multiplanar images of organs and structures within the body without radiation. It is the preferred modality for evaluating the internal structure of the spinal cord, providing assessment of conditions such as degenerative disc pathology, osteomyelitis, and discitis.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months), one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow-up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR CERVICAL SPINE MRI

Evaluation of Neurologic Deficits ^(1,2)

- With any of the following new neurological deficits documented on physical exam that localizes to the cervical spine:
 - Extremity muscular weakness (not likely caused by plexopathy or peripheral

neuropathy)

- Pathologic reflexes (e.g., Babinski, Lhermitte's sign, ⁽³⁾ Chaddock Sign, ⁽⁴⁾ Hoffman's and other upper motor neuron signs); **OR** abnormal deep tendon reflexes (not likely caused by plexopathy, or peripheral neuropathy)
- Absent/decreased sensation along a particular cervical dermatome (nerve distribution): pin prick, touch, vibration, proprioception, or temperature (and not likely caused by plexopathy or peripheral neuropathy)
- Upper or lower extremity increase muscle tone/spasticity
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- Suspected cervical cord compression with any neurological deficits as listed above

Evaluation of Neck Pain ^(5,6)

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment
Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute "inability to complete" treatment.
- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a cervical radiculopathy. ^(7,8)
- Isolated neck pain in pediatric population when at least **ONE** of the following red flags are present ^(9,10) (Note: conservative care is not required if red flags are present).
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination
 - Early morning stiffness and/or gelling
 - Night pain that prevents or disrupts sleep

- Radicular pain
- Fever, weight loss, or malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Suspected Myelopathy ^(11,12)

- Progressive symptoms including hand clumsiness, worsening handwriting, difficulty with grasping and holding objects, diffuse numbness in the hands, pins and needles sensation, increasing difficulty with balance and ambulation
- Any of the **neurological deficits** as noted above

NOTE: Does **NOT** require conservative care

Evaluation of Known or Suspected Multiple Sclerosis (MS) ^(12,13)

- Evidence of MS on recent baseline Brain MRI
- Suspected or known MS with new or changing symptoms consistent with cervical spinal cord disease (focal **neurologic deficit** or clinical sign, e.g., Lhermitte sign) ⁽³⁾
- Suspected or known pediatric demyelinating diseases (MS/ADEM)
- For evaluation of neuromyelitis optica spectrum disorders (recurrent or bilateral optic neuritis; recurrent transverse myelitis) ⁽¹⁴⁾
- For known MS, prior to the initiation or change of disease modification treatments and assess disease burden (to establish a new baseline) ⁽¹⁵⁾
- Follow-up scans, including brain and spine imaging, if patients have known cervical spine disease:
 - 3-6 months after starting/changing treatment
 - Every 6-12 months until stable on disease modifying treatment
 - Once stable on disease modifying treatment, every 1-2 years to assess for subclinical disease activity, less frequently when stable for 2-3 years

Evaluation of Trauma or Acute Injury ⁽¹⁶⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment***
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis) (Both MRI and CT are indicated) ^(17,18)

- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or CT) needing further evaluation
- When office notes specify that the C-spine cannot be clinical cleared because of a high-risk feature such as neurological deficit, midline spinal tenderness, altered mental status, high risk mechanism, unable to rotate neck as described in the NEXUS (National Emergency X-Radiography Utilization Study) or CCR (Canadian Cervical Rules) criteria for imaging:
 - CT for initial imaging
 - MRI when suspect spinal cord or nerve root injury or when patient is obtunded, and CT is negative
 - CT or MRI for treatment planning of unstable spine

Evaluation of Compression Fractures ⁽¹⁹⁾

- With history of malignancy
 - To aid in differentiation of benign osteoporotic fractures from metastatic disease
 - A follow-up MRI in 6-8 weeks after initial MRI when initial imaging cannot decipher (indeterminate) benign osteoporotic fracture from metastatic disease ⁽²⁰⁾
- Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture
- Fracture with imaging characteristics concerning for underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the MRI will change management

Evaluation of Tumor, Cancer, or Metastasis

With any of the Following:

- **Primary tumor** ⁽²¹⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer
 - Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
 - With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ^(6,22)
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam

- With an associated new focal **neurologic deficit**
- Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or neck pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽²³⁾

Evaluation of Known or Suspected Infection ⁽²⁴⁾

E.g., Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or x-ray findings

Evaluation of Known or Suspected Inflammatory Disease or Atlantoaxial Instability ⁽²⁵⁾

- Rheumatoid arthritis with neurologic signs/symptoms, or evidence of subluxation on x-ray (lateral x-ray in flexion and neutral should be the initial study) ^(26,27)
 - Patients with negative x-ray but symptoms suggestive of cervical instability or in patients with neurologic deficits ⁽²⁸⁾
- High-risk disorders affecting the atlantoaxial articulation (i.e. Down syndrome, Marfan syndrome) with neurological signs/symptoms, abnormal neurological exam, or evidence of abnormal or inconclusive x-ray of the cervical spine ⁽²⁹⁾
- Spondyloarthropathies, known or suspected
 - Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms OR
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽²⁴⁾

E.g. HIV, chemotherapy, leukemia, or lymphoma

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

Note: See combination requests, below, for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected), based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata ^(30,31)
- Known Arnold-Chiari syndrome (For initial imaging (one-time initial assessment) see Combinations below)
- Known Chiari I malformation without syrinx or hydrocephalus, follow-up imaging after initial diagnosis with new or changing signs/symptoms or exam findings consistent with spinal cord pathology ⁽³²⁾
- Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation
- Syrinx or syringomyelia (known or suspected) ⁽³³⁾
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis)
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
- Toe walking in a child with signs/symptoms of myelopathy (upper motor neuron signs/hyperreflexia) localized to the Cervical Spine ⁽³⁴⁾
- Initial evaluation of trigeminal neuralgia ⁽³⁵⁾ not explained on recent Brain imaging
- Horner's syndrome with symptoms localizing the lesion to the cervical spine (radicular signs) ^(36,37)
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽³⁸⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post operative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays

NOTE: for this indication, advanced imaging should not occur until > 6 months after surgery

- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings
- New or changing neurological deficits or symptoms post-operatively ⁽³⁹⁾ (see neurological deficit section above)
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification.
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- Down Syndrome ⁽⁴⁰⁾:
 - With signs or symptoms suggestive of possible atlantoaxial instability (such as neck pain, neck stiffness, head tilt, gait changes, radicular pain or a new onset neurologic deficit)
- LZTR1-related Schwannomatosis ⁽⁴¹⁾:
 - Every two years starting at age 12
- Neurofibromatosis 1 (NF1) ^(42,43):
 - Signs and symptoms concerning for spinal tumor

- NF2-Related Schwannomatosis ⁽⁴⁴⁾:
 - Prior to cranial surgery OR
 - Signs and symptoms concerning for spinal tumor
- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(41,45):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5
- Von Hippel-Lindau (VHL) ⁽⁴⁶⁾:
 - Annually (including at diagnosis) starting at age 11
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance.

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Marfan Syndrome ⁽⁴⁷⁾:
 - For low back pain, proximal leg pain, genital/rectal pain OR weakness and numbness above knee
- NF2-Related Schwannomatosis ⁽⁴⁴⁾:
 - Signs and symptoms concerning for spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- LZTR1-related Schwannomatosis ⁽⁴¹⁾:
 - Every two years starting at age 12
- Neurofibromatosis 1 (NF1) ^(42,43):
 - Signs and symptoms concerning for spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Abdomen MRI

- Von Hippel-Lindau (VHL) ⁽⁴⁶⁾:

- Annually (including at diagnosis) starting at age 11

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Whole Body MRI

- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(41,45):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5

OTHER COMBINATION STUDIES WITH CERVICAL SPINE MRI

Note: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Cervical Spine MRI and Cervical Spine CT

- OPLL (Ossification of posterior longitudinal ligament) ⁽⁴⁸⁾
- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Unstable craniocervical junction
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Brain/Cervical Spine MRI

- Horner's syndrome with symptoms localizing the lesion to the brain and cervical spine (vertigo, altered facial sensation, contralateral CN IV palsy, crossed motor/sensory signs, radicular signs) ^(36,37)

Brain/Cervical Spine/Thoracic Spine MRI

- Combination studies for MS: These body regions might be evaluated separately or in combination as guided by physical examination findings (e.g., localization to a particular segment of the spinal cord), patient history (e.g., symptom(s), time course, and where in the CNS the likely localization(s) is/are), and other available information, including prior

imaging.

- For evaluation of neuromyelitis optica spectrum disorders (recurrent or bilateral optic neuritis; recurrent transverse myelitis) ⁽⁴⁹⁾
- For known MS, prior to the initiation or change of disease modification treatments and assess disease burden (to establish a new baseline) ^(13,15)
- Follow-up scans, including brain and spine imaging, if patients have known spine disease:
 - 3-6 months after starting/changing treatment
 - Every 6-12 months until stable on disease modifying treatment
 - Once stable on disease modifying treatment, every 1-2 years to assess for subclinical disease activity, less frequently when stable for 2-3 years

Brain/Cervical Spine/ Thoracic Spine/Lumbar Spine MRI

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(31,50–52)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽²¹⁾
 - Drop metastasis from brain or spine
 - Suspected leptomeningeal carcinomatosis ⁽⁵³⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽³⁸⁾
- Tumor evaluation and monitoring in cancer predisposition syndromes

Cervical Spine/Thoracic Spine MRI

- Initial evaluation of known or suspected syrinx or syringomyelia
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis) ⁽³³⁾
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
- For evaluation of highly suspected multiple sclerosis (MS) when Brain MRI has indeterminate findings and/or does not fulfill the McDonald criteria for the diagnosis of MS
- With suspected transverse myelitis - with appropriate clinical symptoms (e.g., bilateral

weakness, sensory disturbance, and autonomic dysfunction which typically evolve over hours or days)

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(54,55) (e.g., congenital scoliosis, idiopathic scoliosis, scoliosis with vertebral anomalies)
- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(56,57)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(57,58):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)
 - Early onset
 - Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)
 - Pre-operative planning
 - When office notes clearly document how imaging will change management
- Arnold-Chiari malformations ^(31,59)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ⁽⁵⁵⁾
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽⁶⁰⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ^(30,31,60) when anesthesia required for imaging ⁽⁶¹⁾ (e.g., meningocele, lipomenocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽²¹⁾
 - Drop metastasis from brain or spine (imaging also includes brain)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽⁶²⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes

- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽³⁸⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72141, 72142, 72156, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region

Active Modalities

- Physical therapy

- Physician-supervised home exercise program**
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections (e.g., epidural injection, selective nerve root block)
- Medical Devices (e.g., TENS unit, bracing)

****Home Exercise Program**

The following two elements are required to meet conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g., increased pain or inability to physically perform exercises).

Cervical Myelopathy

Symptom severity varies, and a high index of suspicion is essential for making the proper diagnosis in early cases. Symptoms of pain and radiculopathy may not be present. The natural history of myelopathy is characterized by neurological deterioration. The most frequently encountered symptom is gait abnormality (86%) followed by increased muscular reflexes (79.1%), pathological reflexes (65.1%), paresthesia of upper limb (69.8%) and pain (67.4%). ⁽¹¹⁾

NEXUS Criteria for C-Spine Imaging ⁽⁶³⁾

Clears patients from cervical spine fracture clinically, without imaging when none of the following are present

- Focal neurologic deficit present
- Midline spinal tenderness present
- Altered level of consciousness present
- Intoxication present
- Distracting injury present

Canadian C-Spine Rule ⁽⁶⁴⁾

Clinically clears cervical spine fracture without imaging in alert, stable trauma patients.

With all of the following:

- Low risk factor present
 - Sitting position in the ED, ambulatory at any time, delayed (not immediate onset)

neck pain, no midline tenderness. Simple rear-end motor vehicle collision (MVC) (not simple if pushed into traffic, hit by bus/large truck, rollover, hit by high-speed vehicle)
AND

- Able to actively rotate neck 45° left and right **AND**
- None of the following high-risk factors
 - Age ≥65 years
 - Extremity paresthesia's
 - Dangerous mechanism (e.g., fall from ≥3 ft (0.9 m) / 5 stairs, axial load injury, high speed MVC/rollover/ejection, bicycle collision, motorized recreational vehicle)

Gait and Spine Imaging

Table 1 (65–68)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines
Sensory ataxic	Cautious, stomping, worsening without visual input (ie + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar

Gait	Characteristic	Work up/Imaging
		spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Diagnosis and Treatment of Cervical Radiculopathy from Degenerative Disorders ⁽¹⁾

Study Design: The document outlines the development of clinical guidelines by the North American Spine Society (NASS) for the diagnosis and treatment of cervical radiculopathy from degenerative disorders. The guidelines were developed through a systematic review of the literature and expert consensus. The methodology included a comprehensive literature search, evidence analysis, and formulation of evidence-based recommendations.

Target Population: The guidelines are intended for adult patients (18 years or older) with a chief complaint of pain in a radicular pattern in one or both upper extremities related to compression and/or irritation of one or more cervical nerve roots. The target population includes patients with varying degrees of sensory, motor, and reflex changes, as well as dysesthesias and paresthesias related to nerve root(s) without evidence of spinal cord dysfunction (myelopathy).

Key Factors:

1. **Objective:** To provide evidence-based recommendations for the diagnosis and treatment of cervical radiculopathy from degenerative disorders.
2. **Scope and Purpose:** The guidelines aim to assist practitioners in improving the quality and efficiency of care delivered to patients with cervical radiculopathy from degenerative disorders.

3. **Methodology:** The guidelines were developed through multidisciplinary collaboration, evidence analysis training, disclosure of potential conflicts of interest, and standardized levels of evidence and grades of recommendation.
4. **Recommendations:**
 - **Diagnosis/Imaging:** Suggested diagnostic tests include MRI, CT, and CT myelography. Provocative tests such as the shoulder abduction and Spurling's tests may be considered.
 - **Outcome Measures:** Recommended outcome measures include the Neck Disability Index (NDI), SF-36, SF-12, and Visual Analog Scale (VAS).
 - **Medical/Interventional Treatment:** The role of pharmacological treatment, physical therapy/exercise, manipulation/chiropractics, epidural steroid injections, and ancillary treatments such as bracing, traction, electrical stimulation, acupuncture, and TENS are discussed.
 - **Surgical Treatment:** Various surgical options are compared, including anterior cervical decompression with fusion (ACDF), anterior cervical decompression alone (ACD), anterior cervical decompression and fusion with instrumentation (ACDFI), and posterior decompression with or without fusion.

ACR Appropriateness Criteria® Cervical Pain or Cervical Radiculopathy ⁽⁶⁾

Study Design: The study design involves a systematic review of literature and expert panel recommendations to establish guidelines for imaging procedures in various clinical scenarios related to cervical pain and radiculopathy. The criteria are revised periodically to incorporate new evidence and advancements in imaging technology.

Target Population: The target population includes adults experiencing cervical pain or cervical radiculopathy. The document addresses different clinical scenarios such as acute or increasing cervical pain without radiculopathy, acute or increasing cervical pain with radiculopathy, prior cervical spine surgery, suspected or known infection, diagnosis of malignancy, suspected cervicogenic headache, chronic cervical pain without radiculopathy, and chronic cervical pain with radiculopathy.

Key Factors

Imaging Procedures: The document categorizes imaging procedures based on their appropriateness for different clinical scenarios. Procedures include radiography, MRI, CT, CT myelography, MRA, bone scan, FDG-PET/CT, and others.

Relative Radiation Levels: Each imaging procedure is assessed for its relative radiation level, indicating the potential adverse health effects associated with radiation exposure.

Clinical Scenarios: The criteria provide specific recommendations for initial imaging based on the presence or absence of trauma, "red flag" symptoms, and other clinical indicators.

Expert Panel: The guidelines are developed by an expert panel consisting of radiologists, neurologists, orthopedic surgeons, and other specialists from various institutions.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽¹⁶⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ANALYSIS OF EVIDENCE

Shared Findings:

Diagnosis and Imaging: All three articles emphasize the importance of imaging in diagnosing cervical spine conditions. "Bono et al 2010" discusses the use of MRI and CT for diagnosing cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" provides detailed appropriateness criteria for various imaging modalities in different scenarios of cervical pain and radiculopathy. ⁽⁶⁾ "Hassankhani et al 2024" highlights the role of CT and MRI in acute spinal trauma. ⁽¹⁶⁾

Clinical Guidelines: The articles stress the need for evidence-based clinical guidelines. "Bono et al 2010" outlines the North American Spine Society's guidelines for diagnosing and treating cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" presents the American College of Radiology's appropriateness criteria for imaging cervical pain and radiculopathy. ⁽⁶⁾

"Hassankhani et al 2024" discusses the ACR's guidelines for imaging acute spinal trauma. ⁽¹⁶⁾

Role of MRI: MRI is consistently recommended across all articles for its superior ability to visualize soft tissue abnormalities. "Bono et al 2010" mentions MRI's role in diagnosing cervical radiculopathy. ⁽¹⁾ "Eldaya et al 2024" lists MRI as appropriate for various cervical pain scenarios. ⁽⁶⁾ "Hassankhani et al 2024" emphasizes MRI's importance in detecting ligamentous, spinal cord, or nerve root injuries. ⁽¹⁶⁾

POLICY HISTORY

Date	Summary
June 2025	● Guideline name changed from Cervical Spine MRI to Cervical Spine Magnetic Resonance Imaging (MRI) ● Guideline number changed from Evolent CG 040 to Evolent CG 2017 ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references and background ● MS ○ Moved combo section down ○ Changed follow up of known MS after changing or starting treatment to 3-6 months from 6-12 months ● Evaluation Compression Fractures ○ Added ■ Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture ■ Fracture with imaging characteristics concerning for underlying malignancy ● Clarified trauma imaging criteria ● Updated the Genetics and Rare Diseases section ○ Clarified Horner's syndrome
June 2024	● Aligned Combinations Studies across guidelines

Date	Summary
	• Added Contraindications and Preferred Studies section • Reduced background section • Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2057 for Thoracic Spine Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2057	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance imaging (MRI) produces high quality multiplanar images of organs and structures within the body without using ionizing radiation. It is the preferred modality for evaluating the internal structure of the spinal cord, providing assessment of conditions such as degenerative disc pathology, osteomyelitis, and discitis.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months), one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow-up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient (the entire spinal cord and/or autonomic postganglionic chain must be assessed).

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR THORACIC SPINE MRI

Evaluation of Neurologic Deficits ⁽¹⁾

- With any of the following new neurological deficits documented on physical exam that localizes to the thoracic spine
 - Extremity muscular weakness (not likely caused by plexopathy or peripheral neuropathy)

- Pathologic reflexes (e.g., Babinski, Lhermitte's sign ⁽²⁾, Chaddock Sign ⁽³⁾, Hoffman's and other upper motor neuron signs); **OR** abnormal deep tendon reflexes (not likely caused by plexopathy, or peripheral neuropathy)
- Absent/decreased sensation along a particular thoracic dermatome (nerve distribution): pin prick, touch, vibration, proprioception, or temperature (and not likely caused by plexopathy, or peripheral neuropathy)
- Upper or lower extremity increase muscle tone/spasticity
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- Suspected thoracic cord compression with any neurological deficits as listed above

Evaluation of Back Pain ⁽¹⁾

With any of the following:

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment
Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute "inability to complete" treatment.
- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a thoracic radiculopathy ^(4,5)
- Isolated back pain in pediatric population when at least ONE of the following red flags are present ^(6,7) (Note: conservative care not required if red flags are present).
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination
 - Early morning stiffness and/or gelling
 - Night pain that prevents or disrupts sleep
 - Radicular pain

- Fever, weight loss, or malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Suspected Myelopathy ^(8,9)

- Progressive symptoms including unsteadiness, broad-based gait, increased muscle tone, pins and needles sensation, weakness and wasting of the lower limbs, diminished sensation to light touch, temperature, proprioception, and vibration; limb hyperreflexia and pathologic reflexes; bowel and bladder dysfunction in more severe cases
- Any of the **neurological deficits** as noted above

NOTE: Does **NOT** require conservative care

Evaluation of Known or Suspected Multiple Sclerosis ^(9,10)

- Suspected or known multiple sclerosis (MS) with new or changing symptoms suggesting underlying thoracic spinal cord disease (i.e., transverse myelitis, progressive myelopathy)
- Suspected or known pediatric demyelinating diseases (MS/ADEM)
- For evaluation of neuromyelitis optica spectrum disorders (recurrent or bilateral optic neuritis; recurrent transverse myelitis) ⁽¹¹⁾
- For known MS, prior to the initiation or change of disease modification treatments and assess disease burden (to establish a new baseline) ^(10,12)
- Follow-up scans, including brain and spine imaging, if patients have known thoracic spine disease:
 - 3-6 months after starting/changing treatment
 - Every 6-12 months until stable on disease modifying treatment
 - Once stable on disease modifying treatment, every 1-2 years to assess for subclinical disease activity, less frequently when stable for 2-3 years

Evaluation of Trauma or Acute Injury ⁽¹³⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment***
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis, diffuse idiopathic skeletal hyperostosis) (Both MRI and CT are approvable) ^(14,15)
- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or CT) needing further evaluation

Evaluation of Compression Fractures ⁽¹⁶⁾

- With history of malignancy
 - To aid in differentiation of benign osteoporotic fractures from metastatic disease
 - A follow-up MRI in 6-8 weeks after initial MRI when initial imaging cannot decipher (indeterminate) benign osteoporotic fracture from metastatic disease
- Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture
- Fracture with imaging characteristics concerning for underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the MRI will change management

Evaluation of Tumor, Cancer, or Metastasis

With any of the following:

- **Primary tumor** ⁽¹⁷⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the past year or as per surveillance imaging guidance for that cancer
 - Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
 - With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ⁽¹⁸⁾
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam
 - With an associated new focal **neurologic deficit** as above
 - Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or back pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽¹⁹⁾

Evaluation of Known or Suspected Infection ⁽²⁰⁾

E.g., Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP)

or radiographic findings

Evaluation of Known or Suspected Inflammatory Disease ⁽²⁰⁾

- Spondyloarthropathies, known or suspected
 - Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms OR
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽²⁰⁾

E.g., HIV, chemotherapy, leukemia, or lymphoma

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

Note: See **combination requests**, below, for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected), based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata ^(21–23)
- Known Arnold-Chiari syndrome (For **initial imaging** (one-time initial assessment) see **combination** below)
 - Known Chiari I malformation without syrinx or hydrocephalus, follow-up imaging after initial diagnosis with new or changing signs/symptoms or exam findings consistent with spinal cord pathology ⁽²⁴⁾
 - Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation
- Syrinx or syringomyelia (known or suspected)
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis) ⁽²⁵⁾
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
- Toe walking in a child with signs/symptoms of myelopathy (upper motor neuron signs/hyperreflexia) localized to the thoracic spine ⁽²⁶⁾
- CSF leak highly suspected and supported by patient history and/or physical exam

findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁷⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to spinal cord stimulator to exclude canal stenosis if no prior MRI imaging of the thoracic spine has been done recently ⁽²⁸⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post operative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays

NOTE: for this indication, advanced imaging should not occur until > 6 months after surgery

- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings
- New or changing neurological deficits or symptoms post-operatively ⁽²⁹⁾ (see **neurological deficit** section above).
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification.
- One follow-up exam of a prior indeterminate MRI/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- LZTR1-related Schwannomatosis ⁽³⁰⁾:

- Every 2 years starting at age 12
- Neurofibromatosis 1 (NF1) ^(31,32):
 - Signs and symptoms concerning for spinal tumor
- NF2-Related Schwannomatosis ⁽³³⁾:
 - Signs and symptoms concerning for spinal tumor
- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(30,34):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5
- Von Hippel-Lindau (VHL) ⁽³⁵⁾:
 - Annually (including at diagnosis) starting at age 11
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance.

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- LZTR1-related Schwannomatosis ⁽³⁰⁾:
 - Every 2 years starting at age 12
- Marfan Syndrome ⁽³⁶⁾:
 - For low back pain, proximal leg pain, genital/rectal pain OR
 - Weakness and numbness above knee
- NF2-Related Schwannomatosis ⁽³³⁾:
 - Signs and symptoms concerning for spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Neurofibromatosis 1 (NF1) ^(31,32):
 - Signs and symptoms concerning for brain or spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Abdomen MRI

- Von Hippel-Lindau (VHL) ⁽³⁵⁾:
 - Annually (including at diagnosis) starting at age 11

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Whole Body MRI

- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(30,34):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5

OTHER COMBINATION STUDIES WITH THORACIC SPINE MRI

Note: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Thoracic Spine MRI and Thoracic Spine CT

- OPLL (Ossification of posterior longitudinal ligament) ⁽³⁷⁾
- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Unstable craniocervical junction
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Brain/Cervical Spine/Thoracic Spine MRI

- Combination studies for MS: These body regions might be evaluated separately or in combination as guided by physical examination findings (e.g., localization to a particular segment of the spinal cord), patient history (e.g., symptom(s), time course, and where in the CNS the likely localization(s) is/are), and other available information, including prior imaging.
 - For evaluation of neuromyelitis optica spectrum disorders (recurrent or bilateral optic neuritis; recurrent transverse myelitis) ⁽¹¹⁾
 - For known MS, prior to the initiation or change of disease modification treatments

and assess disease burden (to establish a new baseline) ^(10,12)

- Follow-up scans, including brain and spine imaging, if patients have known spine disease:
 - 3-6 months after starting/changing treatment
 - Every 6-12 months until stable on disease modifying treatment
 - Once stable on disease modifying treatment, every 1-2 to assess for subclinical disease activity, less frequently when stable for 2-3 years

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(21,38–40)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁷⁾
 - Drop metastasis from brain or spine
 - Suspected leptomeningeal carcinomatosis ⁽⁴¹⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁷⁾
- Tumor evaluation and monitoring in cancer predisposition syndromes

Cervical Spine/Thoracic Spine MRI

- Initial evaluation of known or suspected syrinx or syringomyelia
 - With neurologic findings and/or predisposing conditions (e.g., Chiari malformation, prior trauma, neoplasm, arachnoiditis, severe spondylosis) ⁽²⁵⁾
 - To further characterize a suspicious abnormality seen on prior imaging
 - Known syrinx with new/worsening symptoms
 - For evaluation of highly suspected multiple sclerosis (MS) when Brain MRI has indeterminate findings and/or does not fulfill the McDonald criteria for the diagnosis of MS
 - With suspected transverse myelitis - with appropriate clinical symptoms (e.g., bilateral weakness, sensory disturbance, and autonomic dysfunction which typically evolve over hours or days)

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(42,43) (e.g., congenital scoliosis, idiopathic

scoliosis, scoliosis with vertebral anomalies)

- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(44,45)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(45,46):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)
 - Early onset
 - Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)
 - Pre-operative planning
 - When office notes clearly document how imaging will change management
- Arnold-Chiari malformations ^(21,47)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ⁽⁴³⁾
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽²³⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ⁽²¹⁻²³⁾ when anesthesia required for imaging ⁽⁴⁸⁾ (e.g., meningocele, lipomenocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹⁷⁾
 - Drop metastasis from brain or spine (imaging also includes brain)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽⁴⁹⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁷⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72146, 72147, 72157, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region.

Active Modalities

- Physical therapy
- Physician-supervised home exercise program**
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections (e.g., epidural injection, selective nerve root block)

- Medical Devices (e.g., TENS unit, bracing)

****Home Exercise Program**

The following two elements are required to meet conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g., increased pain or inability to physically perform exercises).

Myelopathy

Symptom severity varies, and a high index of suspicion is essential for making the proper diagnosis in early cases. Symptoms of pain and radiculopathy may not be present. The natural history of myelopathy is characterized by neurological deterioration. The most frequently encountered symptom is gait abnormality (86%), followed by increased muscular reflexes (79.1%), pathological reflexes (65.1%), paresthesia of upper limb (69.8%), and pain (67.4%) ⁽⁸⁾

Gait and Spine Imaging

Table 1 ^(50–53)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines

Gait	Characteristic	Work up/Imaging
Sensory ataxic	Cautious, stomping, worsening without visual input (i.e. + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Thoracic Back Pain ⁽¹⁾

Study Design: The document is a guideline developed by the ACR Expert Panel on Neurological Imaging. It reviews the appropriateness of various imaging procedures for different clinical scenarios involving thoracic back pain (TBP). The guidelines are based on a thorough literature review and expert consensus.

Target Population: The target population includes adults with thoracic back pain, categorized into several variants:

1. Acute thoracic back pain without myelopathy or radiculopathy and no red flags.
2. Subacute or chronic thoracic back pain without myelopathy or radiculopathy and no red flags.
3. Thoracic back pain with myelopathy or radiculopathy.
4. Thoracic back pain with one or more of the following: low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.
5. Thoracic back pain with suspicion of cancer, infection, or immunosuppression.

6. Thoracic back pain with radiographic evidence of bone destruction, fracture, or spinal deformity.
7. Thoracic back pain post-thoracic spine surgery.

Key Factors

- **Imaging Procedures:** The document evaluates the appropriateness of various imaging modalities such as radiography, MRI, CT, bone scans, and FDG-PET/CT for each clinical scenario.
- **Radiation Levels:** It provides relative radiation levels for each imaging procedure to help assess the risk-benefit ratio.
- **Clinical Scenarios:** Each variant is discussed in detail, providing recommendations for initial imaging and follow-up based on the presence of specific clinical features and risk factors.
- **Expert Consensus:** The guidelines are developed through collaboration with various experts and organizations, ensuring a comprehensive and balanced approach.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽¹³⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ACR Appropriateness Criteria® Management of Vertebral Compression Fractures: 2022 Update ⁽¹⁶⁾

Study Design: The study design involves the development and revision of the ACR

Appropriateness Criteria, which are evidence-based guidelines for specific clinical conditions. These guidelines are reviewed annually by a multidisciplinary expert panel. The guideline development includes an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies such as the RAND/UCLA Appropriateness Method and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population for this study includes individuals with vertebral compression fractures, which can be caused by various etiologies such as trauma, osteoporosis, or neoplastic infiltration. Osteoporosis-related fractures are the most common cause of VCFs and have a high prevalence among postmenopausal women and similarly aged men. The study also addresses VCFs caused by trauma and malignancies, including primary bone tumors and metastatic cancers.

Key factors:

- The prevalence and causes of VCFs, highlighting the high incidence among postmenopausal women and the increasing incidence in men.
- The importance of diagnostic imaging in characterizing VCFs and guiding treatment decisions.
- The use of various imaging modalities such as MRI, CT, FDG-PET/CT, and bone scans to evaluate VCFs.
- The management of both osteoporotic and pathologic VCFs, including medical management, percutaneous vertebral augmentation, and surgical consultation.
- The role of minimally invasive percutaneous image-guided techniques for treating spine tumors and the potential benefits of vertebral augmentation procedures.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,13,16):

Imaging Techniques: All three articles emphasize the importance of imaging techniques in diagnosing and managing spinal conditions. They discuss various imaging modalities such as MRI, CT, and bone scans. MRI is frequently highlighted as the preferred imaging modality due to its ability to provide detailed soft tissue resolution and assess spinal canal patency.

Role of MRI: MRI is recommended for evaluating spinal conditions, particularly for identifying marrow replacing lesions, osseous destruction, canal compromise, and cord signal abnormalities. MRI with and without IV contrast is suggested for cases with suspected neoplasm, infection, or inflammation.

CT Imaging: CT is recognized for its high-resolution depiction of osseous structures and is useful for preoperative planning and assessing hardware integrity. CT myelography is mentioned as a complementary imaging technique, particularly for presurgical or preradiation treatment planning.

POLICY HISTORY

Date	Summary
June 2025	● Guideline name changed from Thoracic Spine MRI to Thoracic Spine Magnetic Resonance Imaging (MRI) ● Guideline number changed from Evolent CG 042 to Evolent CG 2057 ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references and background ● MS ○ Moved combo section down ○ Changed follow up of known MS after changing or starting treatment to 3-6 months from 6-12 months ● Evaluation Compression Fractures ○ Added ■ Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture ■ Fracture with imaging characteristics concerning for underlying malignancy ● Updated the Genetics and Rare Diseases section
June 2024	● Aligned combination studies across guidelines ● Added contraindications and preferred studies section ● Added Genetics and Rare Diseases section ● Reduced background section ● Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2037 for Lumbar Spine Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2037	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance imaging (MRI) is used in the evaluation, diagnosis, and management of spine-related conditions, e.g., degenerative disc disease, cauda equina compression, radiculopathy, infections, or cancer in the lumbar spine.

Special Note

If there is a combination request* for an overlapping body part, either requested at the same time or sequentially (within the past 3 months) one of the following must be demonstrated:

- The results of the prior study should be inconclusive or show a need for additional or follow-up imaging evaluation
- The office notes should clearly document an indication why overlapping imaging is needed and how it will change management for the patient.

(*Unless approvable in the **combination section** as noted in the guidelines)

INDICATIONS FOR LUMBAR SPINE MRI

Evaluation of Neurologic Deficits ⁽¹⁾

- With any of the following new neurological deficits documented on physical exam that localizes to the lumbar spine
 - Extremity muscular weakness (not likely caused by plexopathy, peripheral neuropathy or neuromuscular disease)
 - Pathologic abnormal reflexes (not likely caused by plexopathy, peripheral neuropathy or neuromuscular disease)

- Absent/decreased sensation along a particular lumbar dermatome (nerve distribution): pin prick, touch, vibration, proprioception or temperature (and not likely caused by plexopathy, or peripheral neuropathy)
- Lower extremity decreased muscle tone (not likely caused by plexopathy, peripheral neuropathy or neuromuscular disease)
- New onset bowel or bladder dysfunction (e.g., retention or incontinence)—not related to an inherent bowel or bladder process
- Gait abnormalities (see **Table 1** below for more details)
- New onset foot drop (not related to a peripheral nerve injury, e.g., peroneal nerve)
- Cauda Equina Syndrome as evidence by severe back pain/sciatica along with one of the defined symptoms (see **Cauda Equina Syndrome** section)

Evaluation of Back Pain ⁽¹⁾

With any of the Following:

- With new or worsening objective **neurologic deficits** on exam, as above
- Failure of **conservative treatment*** for a minimum of six (6) weeks within the last six (6) months:

NOTE - Failure of conservative treatment is defined as one of the following:

- Lack of meaningful improvement after a full course of treatment; **OR**
- Progression or worsening of symptoms during treatment; **OR**
- Documentation of a medical reason the member is unable to participate in treatment

Closure of medical or therapy offices, patient inconvenience, or noncompliance without explanation does not constitute “inability to complete” treatment.

- With progression or worsening of symptoms during the course of **conservative treatment***
- With an abnormal electromyography (EMG) or nerve conduction study (if performed) indicating a lumbar radiculopathy. ^(2,3)
- Isolated back pain in pediatric population when at least ONE of the following red flags are present ^(4,5) (Note: conservative care not required if red flags are present).
 - Age 5 or younger
 - Constant pain
 - Pain lasting > 4 weeks
 - Abnormal neurologic examination
 - Early morning stiffness and/or gelling
 - Night pain that prevents or disrupts sleep
 - Radicular pain

- Fever, weight loss, or malaise
- Postural changes (e.g., kyphosis or scoliosis)
- Limp (or refusal to walk in a younger child)

Evaluation of Trauma or Acute Injury ⁽⁶⁾

- Presents with any of the following **neurological deficits** as above
- With progression or worsening of symptoms during the course of **conservative treatment**
- History of underlying spinal abnormalities (i.e., ankylosing spondylitis or diffuse idiopathic skeletal hyperostosis) (Both MRI and CT are approvable) ^(7,8)
- When the patient is clinically unevaluable or there are preliminary imaging findings (x-ray or CT) needing further evaluation

Pars Defect (Spondylolysis) or Spondylolisthesis

- Pars defect (spondylolysis) or spondylolisthesis in adults when Flexion/Extension x-rays show instability ⁽⁹⁾
- Clinically suspected pars defect (spondylolysis) after plain films (flexion extension instability not required) in pediatric population (< 18 yr.) or athletes and imaging would change treatment ⁽⁴⁾

Evaluation of Compression Fractures ⁽¹⁰⁾

- With history of malignancy
 - To aid in differentiation of benign osteoporotic fractures from metastatic disease
 - A follow-up MRI in 6-8 weeks after initial MRI when initial imaging cannot decipher (indeterminate) benign osteoporotic fracture from metastatic disease
- Fracture on initial imaging in a young patient (< 50) with no history of trauma and concern for pathologic fracture
- Fracture with imaging characteristics concerning for underlying malignancy
- With an associated new focal **neurologic deficit** as above
- Prior to a planned surgery/intervention or if the results of the MRI will change management

Evaluation of Tumor, Cancer, or Metastasis

With any of the Following:

- **Primary tumor** ⁽¹¹⁾
 - Initial staging primary spinal tumor
 - Follow-up of known primary cancer of patient undergoing active treatment within the

- past year or as per surveillance imaging guidance for that cancer
- Known spinal tumor with new signs or symptoms (e.g., new or increasing nontraumatic pain, physical, laboratory, and/or imaging findings)
- With an associated new focal **neurologic deficit** as above
- **Metastatic tumor** ⁽¹²⁾
 - With evidence of metastasis on bone scan needing further clarification **OR** inconclusive findings on a prior imaging exam
 - With an associated new focal **neurologic deficit**
 - Known malignancy with new signs or symptoms (e.g., new or increasing nontraumatic pain, radiculopathy or back pain that occurs at night and wakes the patient from sleep with known active cancer, physical, laboratory, and/or imaging findings) in a tumor that tends to metastasize to the spine ⁽¹³⁾

Evaluation of Known or Suspected Infection ⁽¹⁴⁾

E.g. Osteomyelitis or abscess

- As evidenced by signs and/or symptoms, laboratory (i.e., abnormal white blood cell count, ESR and/or CRP) or prior imaging findings
- Follow-up imaging of infection
 - With worsening symptoms/laboratory values (i.e., white blood cell count, ESR/CRP) or x-ray findings

Evaluation of Known or Suspected Inflammatory Disease

- Spondyloarthropathies, known or suspected
 - Ankylosing Spondylitis/Spondyloarthropathies with non-diagnostic or indeterminate x-ray and appropriate rheumatology workup
- Known and suspected neuroinflammatory conditions (such as sarcoidosis, Bechet's)
 - Initial evaluation of suspected neuroinflammatory conditions after initial workup and detailed neurological examination
 - Follow-up of known neuroinflammatory conditions when there are either:
 - New or worsening signs or symptoms **OR**
 - To evaluate treatment response

Evaluation of Spine Abnormalities Related to Immune System Suppression ⁽¹⁴⁾

E.g., HIV, chemotherapy, leukemia, or lymphoma

- As evidenced by signs/symptoms, laboratory, or prior imaging findings

Other Indications

Note: See **combination requests**, below, for initial advanced imaging assessment and pre-operatively

- Tethered cord or spinal dysraphism (known or suspected), based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata ^(15,16)
- Known anorectal malformations ⁽¹⁷⁾
- Suspicious sacral dimple (those that are deep, larger than 0.5 cm, located within the superior portion of the gluteal crease or above the gluteal crease, multiple dimples, or associated with other cutaneous markers) or duplicated or deviated gluteal cleft ⁽¹⁸⁾
 - Patients ≤ 3 months should have ultrasound
- Toe walking in a child when associated with upper motor neuron signs, including hyperreflexia, spasticity; or orthopedic deformity with concern for tethered cord (e.g., pes cavus, clawed toes, leg or foot length deformity (excluding tight heel cords)) ⁽¹⁹⁾
- Known Chiari II (Arnold-Chiari syndrome), III, or IV malformation ⁽¹⁵⁾
- For follow-up/repeat evaluation of Arnold-Chiari I with new signs or symptoms suggesting recurrent spinal cord tethering (For initial diagnosis see Combinations section below)
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g., known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁰⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT ⁽¹⁾

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of postoperative pseudarthrosis, hardware complication and/or extent of fusion after initial x-rays

NOTE: for this indication, advanced imaging should not occur until > 6 months after surgery

- Surgical infection as evidenced by signs/symptoms, laboratory, or prior imaging findings
- New or changing neurological deficits or symptoms post-operatively ⁽²¹⁾ (see **neurological deficit** section above)
- Known or suspected complications

- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery unless otherwise specified

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification.
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- LZTR1-related Schwannomatosis ⁽²²⁾:
 - Every 2 years starting at age 12
- Neurofibromatosis 1 (NF1) ^(23,24):
 - Signs and symptoms concerning for spinal tumor
- NF2-Related Schwannomatosis ⁽²⁵⁾:
 - Prior to regional anesthesia OR
 - Signs and symptoms concerning for spinal tumor
- SMARCA4 and SMARCB1 (includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(22,26):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5
- Von Hippel-Lindau (VHL) ⁽²⁷⁾:
 - Annually (including at diagnosis) starting at age 11
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance.

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Marfan Syndrome ⁽²⁸⁾:
 - For low back pain, proximal leg pain, genital/rectal pain OR weakness and numbness above knee
- NF2-Related Schwannomatosis ⁽²⁵⁾:
 - Signs and symptoms concerning for spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- LZTR1-related Schwannomatosis ⁽²²⁾:
 - Every 2 years starting at age 12
- Neurofibromatosis 1 (NF1) ^(23,24):
 - Signs and symptoms concerning for spinal tumor

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Abdomen MRI

- Von Hippel-Lindau (VHL) ⁽²⁷⁾:
 - Annually (including at diagnosis) starting at age 11

Brain/Cervical Spine/Thoracic Spine/Lumbar Spine/Whole Body MRI

- SMARCA4 and SMARCB1 (includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(22,26):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months from age 19 months – 5 years
 - Annually after age 5

OTHER COMBINATION STUDIES WITH LUMBAR SPINE MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated

Lumbar Spine MRI and Lumbar Spine CT

- Pathologic or complex fractures
- Malignant process of spine with both bony and soft tissue involvement
- Clearly documented indication for bony and soft tissue abnormality where assessment will change management for the patient

Brain/Cervical Spine/ Thoracic Spine/Lumbar Spine MRI

- For initial evaluation of a suspected Arnold Chiari malformation
- Follow-up imaging of a known type II or type III Arnold Chiari malformation. For Arnold Chiari type I, follow-up imaging only if new or changing signs/symptoms ^(15,29–31)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹¹⁾
 - Drop metastasis from brain or spine
 - Suspected leptomeningeal carcinomatosis ⁽³²⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g. known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁰⁾

Cervical Spine/Thoracic Spine/Lumbar Spine MRI

- Survey/complete initial assessment of infant/child with congenital scoliosis or juvenile idiopathic scoliosis under the age of 10 ^(33,34) (e.g., congenital scoliosis, idiopathic scoliosis, scoliosis with vertebral anomalies)
- In the presence of neurological deficit, progressive spinal deformity, or for preoperative planning ^(35,36)
- Back pain with known vertebral anomalies (hemivertebrae, hypoplasia, agenesis, butterfly, segmentation defect, bars, or congenital wedging) in a child on preliminary imaging
- Scoliosis with any of the following ^(36,37):
 - Progressive spinal deformity
 - Neurologic deficit (new or unexplained)
 - Early onset
 - Atypical curve (e.g., short segment, >30° kyphosis, left thoracic curve, associated organ anomalies)
 - Pre-operative planning
 - When office notes clearly document how imaging will change management

- Arnold-Chiari malformations ^(15,38)
 - Arnold-Chiari I
 - For evaluation of spinal abnormalities associated with initial diagnosis of Arnold-Chiari Malformation. (C/T/L spine due to association with tethered cord and syringomyelia), and initial imaging has not been completed ⁽³⁴⁾
 - Arnold-Chiari II-IV - For initial evaluation and follow-up as appropriate
 - Usually associated with open and closed spinal dysraphism, particularly meningocele ⁽³⁹⁾
- Tethered cord, or spinal dysraphism (known or suspected) based on preliminary imaging, neurological exam, and/or high-risk cutaneous stigmata, ^(15,16,39) when anesthesia required for imaging ⁽⁴⁰⁾ (e.g., meningocele, lipomenocele, diastematomyelia, fatty/thickened filum terminale, and other spinal cord malformations)
- Oncological Applications (e.g., primary nervous system, metastatic) ⁽¹¹⁾
 - Drop metastasis from brain or spine (imaging also includes brain)
 - Suspected leptomeningeal carcinomatosis (LC) ⁽⁴¹⁾
 - Known tumor evaluation and monitoring in neurocutaneous syndromes
- CSF leak highly suspected and supported by patient history and/or physical exam findings (e.g. known or suspected spontaneous intracranial hypotension (SIH), post lumbar puncture headache, post spinal surgery headache, orthostatic headache, rhinorrhea or otorrhea, or cerebrospinal-venous fistula) ⁽²⁰⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72148, 72149, 72158, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Treatment

Non-operative conservative treatment should include a multimodality approach consisting of at least one (1) active and one (1) inactive component targeting the affected region.

Active Modalities

- Physical therapy
- Physician-supervised home exercise program**
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections (e.g., epidural injection, selective nerve root block)
- Medical Devices (e.g., TENS unit, bracing)

**Home Exercise Program

The following two elements are required to meet conservative therapy guidelines for HEP ⁽¹⁾:

- Documentation of an exercise prescription/plan provided by a physician, physical therapist, or chiropractor; **AND**
- Follow-up documentation regarding completion of HEP after the required 6-week timeframe or inability to complete HEP due to a documented medical reason (e.g., increased pain or inability to physically perform exercises).

Gait and Spine Imaging

Table 1 (42–45)

Gait	Characteristic	Work up/Imaging
Hemiparetic	Spastic unilateral, circumduction	Brain and/or, Cervical spine imaging based on associated symptoms
Diplegic	Spastic bilateral, circumduction	Brain, Cervical and Thoracic Spine imaging
Myelopathic	Wide based, stiff, unsteady	Cervical and/or Thoracic spine MRI based on associated symptoms
Cerebellar Ataxic	Broad based, clumsy, staggering, lack of coordination, usually also with limb ataxia	Brain imaging
Apraxic	Magnetic, shuffling, difficulty initiating	Brain imaging
Parkinsonian	Stooped, small steps, rigid, turning en bloc, decreased arm swing	Brain Imaging
Choreiform	Irregular, jerky, involuntary movements	Medication review, consider brain imaging as per movement disorder Brain MR guidelines
Sensory ataxic	Cautious, stomping, worsening without visual input (ie + Romberg)	EMG, blood work, consider spinal (cervical or thoracic cord imaging) imaging based on EMG
Neuropathic	Steppage, dragging of toes	EMG initial testing; BUT if there is a foot drop, lumbar spine MRI is appropriate without EMG Pelvis MR if there is evidence of plexopathy
Vestibular	Insecure, veer to one side, worse when eyes closed, vertigo	Consider Brain/IAC MRI

Cauda Equina Syndrome

- Symptoms include severe back pain or sciatica along with one or more of the following:
 - Saddle anesthesia - loss of sensation restricted to the area of the buttocks, perineum, and inner surfaces of the thighs (areas that would sit on a saddle)

- Recent bladder/bowel dysfunction
- Achilles reflex absent on both sides
- Sexual dysfunction that can come on suddenly
- Absent anal reflex and bulbocavernosus reflex

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Low Back Pain: 2021 Update ⁽¹⁾

Study Design: The study is an update of the ACR Appropriateness Criteria for low back pain, developed by the Expert Panel on Neurological Imaging. The criteria are evidence-based guidelines for specific clinical conditions, reviewed annually by a multidisciplinary expert panel. The guideline development and revision include an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies (RAND/UCLA Appropriateness Method and Grading of Recommendations Assessment, Development, and Evaluation or GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population includes patients in the United States with acute low back pain, with or without radiculopathy. Acute low back pain is the leading cause of years lived with disability and the third-ranking cause of disability-adjusted life-years in the United States. The criteria address various scenarios, including uncomplicated acute low back pain, subacute or chronic low back pain, low back pain with suspected cauda equina syndrome, low back pain with a history of prior lumbar surgery, and low back pain with one or more risk factors such as low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.

Key Factors

Imaging Recommendations: The criteria provide detailed recommendations on the appropriateness of various imaging procedures for different clinical scenarios. For example, imaging is typically not warranted for acute uncomplicated low back pain, while MRI is recommended for patients with suspected cauda equina syndrome or those who are candidates for surgery or intervention with persistent or progressive symptoms.

Clinical Scenarios: The document outlines seven variants of low back pain and provides specific imaging recommendations for each variant. These include acute low back pain with or without radiculopathy, subacute or chronic low back pain, low back pain with suspected cauda equina syndrome, low back pain with a history of prior lumbar

surgery, and low back pain with risk factors such as low-velocity trauma, osteoporosis, elderly individuals, or chronic steroid use.

Radiation Levels: The criteria also include relative radiation level designations for each imaging examination, providing information on potential adverse health effects associated with radiation exposure.

ACR Appropriateness Criteria® Acute Spinal Trauma ⁽⁶⁾

Study Design: The document is a revised guideline by the American College of Radiology (ACR) for the appropriateness of imaging procedures in acute spinal trauma. It includes a summary of literature reviews, expert panel recommendations, and evidence-based criteria for various clinical scenarios.

Target Population: The guidelines focus on patients aged 16 years and older who have experienced acute blunt trauma to the cervical, thoracic, or lumbar spine. Specific criteria are provided for different age groups and clinical conditions, including low-risk patients, those with suspected arterial injury, and obtunded patients.

Key Factors:

Imaging Procedures: The document outlines the appropriateness of various imaging modalities such as CT, MRI, MRA, and radiography for different clinical scenarios. It emphasizes the use of CT without IV contrast as the initial imaging modality for most cases.

Clinical Criteria: The guidelines incorporate the NEXUS and Canadian C-Spine Rule (CCR) criteria for determining the need for cervical spine imaging. These criteria are based on factors such as age, mechanism of injury, and clinical symptoms.

Radiation Levels: The document includes relative radiation level designations for each imaging procedure, highlighting the importance of minimizing radiation exposure.

Expert Panel: The guidelines were developed by an expert panel on neurological imaging, including specialists from various institutions and organizations.

ACR Appropriateness Criteria® Management of Vertebral Compression Fractures: 2022 Update ⁽¹⁰⁾

Study Design: The study design involves the development and revision of the ACR Appropriateness Criteria, which are evidence-based guidelines for specific clinical conditions. These guidelines are reviewed annually by a multidisciplinary expert panel. The guideline development includes an extensive analysis of current medical literature from peer-reviewed journals and the application of well-established methodologies such as the RAND/UCLA Appropriateness Method and the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) to rate the appropriateness of imaging and treatment procedures for specific clinical scenarios.

Target Population: The target population for this study includes individuals with vertebral compression fractures, which can be caused by various etiologies such as trauma, osteoporosis, or neoplastic infiltration. Osteoporosis-related fractures are the most common cause of VCFs and have a high prevalence among postmenopausal women and similarly aged

men. The study also addresses VCFs caused by trauma and malignancies, including primary bone tumors and metastatic cancers.

Key factors:

- The prevalence and causes of VCFs, highlighting the high incidence among postmenopausal women and the increasing incidence in men.
- The importance of diagnostic imaging in characterizing VCFs and guiding treatment decisions.
- The use of various imaging modalities such as MRI, CT, FDG-PET/CT, and bone scans to evaluate VCFs.
- The management of both osteoporotic and pathologic VCFs, including medical management, percutaneous vertebral augmentation, and surgical consultation.
- The role of minimally invasive percutaneous image-guided techniques for treating spine tumors and the potential benefits of vertebral augmentation procedures.

ANALYSIS OF EVIDENCE

Shared Findings

Imaging Recommendations: All three articles emphasize the importance of imaging in diagnosing and managing spinal conditions. They recommend using MRI and CT scans as primary imaging modalities due to their high sensitivity and specificity in detecting spinal injuries and abnormalities. For instance, "Hassankhani et al 2024 ACR Acute Spinal Trauma" highlights the use of CT and MRI for acute spinal trauma, while "Hutchins et al 2021 JACR Low Back Pain" and "Khan et al 2023 JACR Management of Vertebral Compression Fractures" also stress the importance of these imaging techniques for low back pain and vertebral compression fractures, respectively. ^(1,6,10)

Clinical Criteria and Guidelines: The articles provide evidence-based guidelines and criteria for managing spinal conditions. "Hassankhani et al 2024 ACR Acute Spinal Trauma" discusses the use of the National Emergency X-Radiography Utilization Study (NEXUS) and the Canadian C-Spine Rule (CCR) for cervical spine injuries. ⁽⁶⁾ Similarly, "Hutchins et al 2021 JACR Low Back Pain" outlines the American College of Radiology Appropriateness Criteria for low back pain management. ⁽¹⁾ "Khan et al 2023 JACR Management of Vertebral Compression Fractures" provides guidelines for managing vertebral compression fractures, including the use of the Spinal Instability Neoplastic Score (SINS) for evaluating spinal stability. ⁽¹⁰⁾

Non-Surgical Management: All three articles emphasize the importance of non-surgical management as the first line of treatment. They recommend conservative therapies such as pain management, physical therapy, and bracing before considering surgical interventions. For example, "Hutchins et al 2021 JACR Low Back Pain" and "Khan et al 2023 JACR Management of Vertebral Compression Fractures" both highlight the role of conservative management in treating low back pain and vertebral compression fractures. ^(1,10)

POLICY HISTORY

Date	Summary
June 2025	- Guideline name changed from Lumbar Spine MRI to Lumbar Spine Magnetic Resonance Imaging (MRI) - Guideline number changed from Evolent CG 044 to Evolent CG 2037 - Added new bullet-point to the General Statement section - Checked the Medicare Advantage box in the Applicable Lines of Business table - Added a Summary of Evidence and Analysis of Evidence - Updated references and background - Updated the Genetics and Rare Diseases section and renamed to Imaging in Known Genetic Conditions - Clarified neurological deficit - Evaluation of Compression Fractures Added - Fracture on initial imaging in a young patient (<50) with no history of trauma and concern for pathologic fracture - Fracture with imaging characteristics concerning for underlying malignancy
June 2024	- Combination Studies made uniform across Guidelines - Added Contraindications and Preferred studies section - Reduced Background - Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2053 for Spinal Canal Magnetic Resonance Angiography (MRA)

Guideline Number: Evolent_CG_2053	<u>Applicable Codes</u>	
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Original Date: May 2008	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) generates images of the blood vessels (both arteries and veins) that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. It can be used to evaluate the blood vessels of the spinal canal and allows for more effective and noninvasive screening for vascular lesions than spinal magnetic resonance imaging (MRI) alone. Spinal Canal MRA may be used for the evaluation of spinal arteriovenous malformations, as well as injuries to blood vessels supplying the spine and cord.

INDICATIONS FOR SPINAL CANAL MR ANGIOGRAPHY (MRA)

- Evaluation of spinal arteriovenous malformation (AVM) ^(1,2)
- Myelopathy when the suspected etiology is a compromise of blood flow or drainage to the spinal cord ⁽³⁾
- Evaluation of a known disc herniation, fracture of the cervical spine, infection, or venous thrombosis where there is concern for vascular pathology (compression or thrombosis) compromising spinal cord blood flow or venous drainage ⁽⁴⁾
- Evaluation of known or suspected vertebral artery injury when there is also concern for vascular compromise to the spinal canal and its contents (otherwise neck MRA or CTA is sufficient to evaluate vertebral artery injury) ⁽⁵⁾



- Preoperative evaluation (e.g., localization of the spinal arteries prior to complex spinal surgery, aortic aneurysm repair, or characterization of suspected vascular lesion of the spinal canal and its contents) ^(6,7)
- Follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested. ⁽⁸⁾

Further Evaluation of Indeterminate Findings on Prior Imaging

Unless follow up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

CODING AND STANDARDS

Codes

72159

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Spinal Arteriovenous Malformations (AVMs)

Spinal dural arteriovenous (AV) fistulas are the most encountered vascular malformation of the spinal cord and are a treatable cause of progressive paraparesis. MR angiography (MRA) can record the pattern and velocity of blood flow through vascular lesions as well as the flow of cerebrospinal fluid throughout the spinal cord. ⁽⁹⁾

Spinal Arteries/Veins

Vascular malformations, trauma, disc herniations, neoplasms, and coagulopathies or infection causing thrombosis can compromise the spinal cord blood supply and drainage.

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

First-Pass Contrast-Enhanced MRA for Pretherapeutic Diagnosis of Spinal Epidural Arteriovenous Fistulas with Intradural Venous Reflux ⁽¹⁾

Study Design: This study was a retrospective analysis conducted at St. Michael's Hospital, University of Toronto, involving 42 consecutive patients with clinical and/or radiologic suspicion of spinal AVF (arteriovenous fistula) from 2000 to 2015.

Target Population: The study included patients with progressive myelopathy and suggestive MR imaging features such as nonresolving or progressive cord edema, cord enhancement, and intradural serpentine flow voids.

Key Factors: The study evaluated the performance of first-pass contrast-enhanced MRA (magnetic resonance angiography) in diagnosing and localizing spinal epidural AVFs with intradural venous reflux. The findings indicated that MRA is a reliable technique for initial diagnosis and localization of these lesions, distinguishing them from other spinal AVFs.



Spinal Cord Infarction Because of Spontaneous Vertebral Artery Dissection ⁽⁵⁾

Study Design: This case study involved a 62-year-old man with a history of hypertension and hyperlipidemia who presented with acute onset of transient flaccid quadriplegia.

Target Population: The patient had severe neck pain radiating down both arms, elevated blood pressure, transient agonal breathing, complete flaccid quadriplegia, areflexia, and bowel/bladder incontinence.

Key Factors: The study discussed the rarity of spinal cord ischemia (SCI), accounting for 1% of all strokes, and highlighted the importance of MRI (magnetic resonance imaging) in diagnosing SCI. It emphasized the role of vertebral artery dissection in causing mid-cervical cord stroke and the utility of MRI in identifying compressive lesions and flow voids.

Spinal Cord Ischemia: Practical Imaging Tips, Pearls, and Pitfalls ⁽⁴⁾

Study Design: This review article provided practical imaging tips, pearls, and pitfalls for diagnosing spinal cord ischemia.

Target Population: The study covered both pediatric and adult populations, discussing various causes of spinal cord ischemia such as cardiac malformations, trauma, atheromatosis, thoracoabdominal aneurysms, embolic disease, dissection, systemic hypotension, spinal arteriovenous malformations, and idiopathic causes.

Key Factors: The article highlighted the clinical presentation of spinal cord infarction, the importance of diffusion imaging, and the role of MR angiography in visualizing the artery of Adamkiewicz. It also discussed the pathophysiologic mechanisms of spinal cord ischemia and the differential diagnosis.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,4,5):

- All three studies emphasize the importance of advanced imaging techniques, such as MRA and MRI, in diagnosing spinal canal conditions.
- They highlight the rarity and complexity of spinal vascular conditions, such as spinal AVFs and spinal cord ischemia.
- The studies underscore the need for accurate and timely diagnosis to facilitate appropriate treatment and improve patient outcomes.

Summary ^(1,4,5):

In summary, these articles collectively provide valuable insights into the use of MRA and MRI for diagnosing spinal canal conditions, highlighting both the shared importance of advanced imaging techniques and the unique contributions of each study to the understanding of spinal vascular pathologies.



POLICY HISTORY

Date	Summary
June 2025	• Updated references and background • This guideline replaces Evolent Clinical Guideline 046 for Spinal Canal MRA/MRV • Guideline renamed Spinal Canal Magnetic Resonance Angiography (MRA) • Added third bullet to General Information • Added Summary of Evidence and Analysis of Evidence
May 2024	• Updated references and background • Contraindications and preferred studies section added to the background

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.



Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2043 for Pelvis Computed Tomography Angiography (CTA)

Guideline Number: Evolut_CG_2043	<u>Applicable Codes</u>	
<i>"Evolut" refers to Evolut Health LLC and Evolut Specialty Services, Inc.</i> <i>© 2008 – 2026 Evolut. All rights Reserved</i>		
Original Date: July 2008	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the arteries that can be evaluated for evidence of stenosis, occlusion, or aneurysms. It is used to evaluate the arteries of the abdominal aorta and the renal arteries. CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function. It is not appropriate as a screening tool for asymptomatic patients without a previous diagnosis.

Special Note

- **NOTE:** For conditions where both abdomen and pelvis imaging are needed and/or the disease process is reasonably expected to involve both the abdomen and pelvis, requests should be resubmitted as CPT 74174 (CTA Abdomen Pelvis). See Evolent Clinical Guideline 2005 for Abdomen Pelvis CTA for coverage indications.
- **NOTE:** When vascular imaging of the aorta and both legs is requested (sometimes incorrectly requested as Abd/Pelvis CTA & Lower Extremity CTA), only **ONE** authorization request is required, using CPT Code 75635 (CTA Abdominal Aorta with Lower Extremity Runoff). This study provides for imaging of the abdomen, pelvis, and both legs. A separate authorization for Lower Extremity CTA is **NOT** needed.

INDICATIONS FOR PELVIS CTA

Venous Disease

- Suspected pelvic congestive syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminate with NO CONTRAINDICATIONS TO

CT ⁽¹⁾

- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US ⁽²⁾
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause ⁽²⁾
- Evaluation of venous thrombosis in the inferior vena cava ⁽³⁾
- Venous thrombosis if previous studies (such as ultrasound) have not resulted in a clear diagnosis ⁽⁴⁾
- Other Vascular Abnormalities of the Pelvis Initial evaluation of inconclusive pelvic vascular findings on prior imaging
- For evaluation or monitoring of non-aortic large vessel pelvic vascular disease (e.g., aneurysm, dissection, arteriovenous malformations (AVM), vascular fistula, intramural hematoma, compression syndromes and vasculitis) and the findings are reasonably expected to be limited to the pelvis ⁽⁵⁻⁷⁾
- Suspected complications of known aneurysm of the pelvis as evidenced by clinical findings such as new onset of pelvic pain (prior ultrasound is **NOT** required)

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor ⁽⁸⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation ^(9,10):

- Evaluation of interventional vascular procedures prior to endovascular aneurysm repair (EVAR), or for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- For imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery and only pelvic imaging is needed (i.e. Abdomen CTA not requested)
- Prior to uterine artery embolization for fibroids (MRA preferred) ⁽¹¹⁾
- Evaluation of vascular anatomy prior to solid organ transplantation
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation

- Follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.
- Evaluation of endovascular/interventional vascular procedures for luminal patency

versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia

- Evaluation of post-operative complications, e.g., pseudoaneurysms related to surgical bypass grafts, vascular stents, and stent-grafts in the pelvis
- Evaluation of post-operative complications of renal transplant allograft ⁽¹¹⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

Note: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless Follow-up is Otherwise Specified within the Guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Marfan Syndrome ⁽¹²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on Transthoracic Echocardiogram (TTE) (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Vascular Ehlers-Danlos (vEDS) Syndrome ⁽¹³⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis CTA

- Vascular Ehlers-Danlos (vEDS) Syndrome ⁽¹³⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities

Chest/Abdomen/Pelvis CTA

- Marfan Syndrome ⁽¹²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond the aortic root **OR** aortic root/ascending aorta are not adequately visualized on Transesophageal Echocardiogram (TEE) (i.e., advanced imaging is needed to monitor the thoracic aorta)

OTHER COMBINATION STUDIES WITH PELVIS CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Pelvis CTA/Pelvis CT:

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽¹⁴⁾
- Prior to uterine artery embolization for fibroids ⁽¹⁵⁾

CODING AND STANDARDS

Codes

72191

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid

☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

Insights into pelvic venous disorders ⁽¹⁾

Study Design: This is a review article that focuses on pelvic venous disorders (PeVD), also known as pelvic congestion syndrome (PCS).

Target Population: Mainly young women between the ages of 20 and 50 years, who experience chronic pelvic pain (CPP) due to venous-related symptoms.

Key Factors: The article discusses the multifactorial etiology of PeVD, including genetic predisposition, anatomical abnormalities, and hormonal factors. It emphasizes the importance of imaging in diagnosing PeVD and proposes a new classification scheme to assist clinical decision-making. The review also covers various therapeutic approaches, including minimally invasive techniques, and highlights the need for standardized guidelines for treatment.

Diagnostic approach to lower limb edema ⁽²⁾

Study Design: This is a review article that proposes a diagnostic algorithm for lower limb edema.

Target Population: Patients with lower limb edema, often referred to vascular specialists for evaluation.

Key Factors: The article emphasizes the importance of a thorough history, physical examination, and laboratory and imaging evaluations to differentiate the causes of lower limb edema. It highlights the multifactorial etiology of edema, including venous disease, lymphatic dysfunction, and systemic disorders. The proposed diagnostic approach aims to accurately identify the causes of chronic edema and institute appropriate therapy.

ACR Appropriateness Criteria® Radiologic Management of Mesenteric Ischemia: 2022 Update ⁽⁶⁾

Study Design: This is an update on the ACR Appropriateness Criteria for the radiologic management of mesenteric ischemia.

Target Population: Patients with mesenteric ischemia, including acute and chronic cases.

Key Factors: The article discusses various endovascular and surgical interventions for mesenteric ischemia, including embolectomy, thrombolysis, angioplasty, and stent placement. It provides evidence-based guidelines for the appropriate use of these interventions based on the clinical scenario, such as the presence of embolus, atherosclerotic plaque, or venous mesenteric ischemia. The guidelines aim to improve patient outcomes by recommending the most suitable imaging and treatment procedures

ANALYSIS OF EVIDENCE

Analysis ^(1,2,6):

In summary, while all three articles highlight the importance of diagnostic imaging and clinical evaluation in managing vascular conditions, they differ in their focus on specific conditions, etiologies, treatment approaches, and prognostic factors. Each article contributes valuable insights into the role of CTA and other imaging modalities in diagnosing and managing these conditions.

Shared Findings:

- **Diagnostic Imaging Techniques:** All three articles emphasize the importance of diagnostic imaging techniques in evaluating pelvic conditions. Discusses the use of Duplex ultrasound (DUS) and contrast-enhanced venous phase computed tomography (CT) for evaluating lower limb edema, highlights the role of CT angiography (CTA) in diagnosing mesenteric ischemia, and focuses on various imaging modalities, including ultrasound, CT, and MRI, for diagnosing pelvic venous disorders (PeVD).
- **Role of CTA:** Discuss the role of CTA in diagnosing vascular conditions and emphasizes CTA's importance in identifying mesenteric ischemia and evaluating the extent of vascular compromise, and mentions CTA's utility in assessing pelvic venous congestion and identifying anatomical abnormalities.
- **Clinical Presentation and Symptoms:** All three articles discuss the clinical presentation and symptoms associated with the conditions they cover.

POLICY HISTORY

Date	Summary
July 2025	• Adjusted guideline title to spell out CT acronym • Added a Summary of Evidence and Analysis of Evidence

Date	Summary
June 2025	• This guideline replaces Evolent Clinical Guideline 038 for Pelvis CTA • Updated language in the Venous disease section for pelvic congestion syndrome (includes May-Thurner and nutcracker syndrome) • Updated language in the Venous disease section for acute and chronic unilateral or asymmetric lower extremity edema • Updated the language in Other Vascular Abnormalities section • Updated language in the preoperative/postoperative section • Added combination studies for known genetic conditions section • Segment added to the combination's studies about if the required use of conscious sedation is needed the entire combination is indicated • Background section reduced
June 2024	• Updated references • Clarified language on combining abdomen and pelvis CTA • Updated Combination studies to align across guidelines

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2042 for Pelvis Computed Tomography (CT)

Guideline Number: Evolent_CG_2042	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Pelvis Computed Tomography (CT) uses radiation to generate images of the organs and structures in the pelvis. Pelvic imaging begins at the umbilicus or iliac crests and extends to the level of the lesser trochanters.

Special Note

Note: PELVIS CT is used for diseases suspected to be limited to the pelvis. CT Abdomen/Pelvis Combo (CPT Codes: 74176, 74177, 74178) is the correct study when the indication(s) include both the abdomen **AND** pelvis, such as CTU (CT Urography), CTE (CT Enterography), acute abdominal pain, widespread inflammatory disease or neoplasm.

When separate requests for CT abdomen and CT Pelvis are encountered for processes involving both the abdomen and pelvis, they need to be resubmitted as a single Evolent Clinical Guideline 2001 for Abdomen CT/Evolent Clinical Guideline 2042 for Pelvis CT (to avoid unbundling).

INDICATIONS FOR PELVIS CT

Pelvic Pain for Unknown Etiology

- CT allowed after initial workup is inconclusive and must include results of the following ⁽¹⁾:
 - Initial imaging, such as ultrasound, scope study, or x-ray **AND**
 - Appropriate laboratory testing (chemistry profile, complete blood count, and urinalysis)

- For acute pelvic pain in a patient over the age of 65 ⁽²⁾

Inflammation and Infection ^(3,4)

- Fistula
 - Suspected perianal fistula or occult anorectal abscess ⁽⁵⁾
 - For patients with recurrent fistula in anal or perianal Crohn's disease when MRI is contraindicated or cannot be performed ⁽⁶⁾
 - Any history of fistula limited to the pelvis that requires re-evaluation or is suspected to have recurred
- Infection
 - Suspected infection in the pelvis (based on elevated WBC, fever, anorexia, or nausea and vomiting)
 - Complications of diverticulitis limited to the pelvis (prior imaging study is not required for diverticulitis diagnosis) with severe abdominal pain or severe tenderness or mass, not responding to antibiotic treatment
 - Any known infection to have created an abscess in the pelvis that requires re-evaluation
- Stricture
 - Suspected urethral stricture or periurethral pathology after initial evaluation with cystoscopy or urethroscopy and additional imaging is needed (such as for suspected malignancy, diverticula, fistula or extensive fibrosis **OR** for preoperative planning)
- Fluid Collection
 - Abnormal fluid collection seen on prior imaging that needs follow-up evaluation and limited to the pelvis

Hernia ⁽⁷⁾

- Suspected hernia and one of the following:
 - Deep pelvic hernia (obturator, sciatic or perineal)
 - Recurrent groin hernia **AND** exam and ultrasound are non-diagnostic or equivocal
- Known or suspected inguinal, obturator, sciatic perineal hernia with suspected complications based on one or more of the following:
 - Symptoms such as severe pain, vomiting, diarrhea or blood in stool
 - Exam findings such as inability to reduce hernia, severe tenderness, guarding, rebound
 - Complication is suggested on prior imaging
- Known pelvic or groin hernia and imaging is needed for surgical planning

Musculoskeletal Indications

When MRI is Contraindicated or Cannot Be Performed

- Known or suspected aseptic/avascular necrosis of hip(s) after completion of initial x-ray ⁽⁸⁾ (CT or MRI can be approved for surgical planning)
- Sacroiliitis (infectious or inflammatory, such as Ankylosing Spondylitis/Spondyloarthropathies) after completion of x-ray and rheumatology workup ⁽⁹⁾
- Persistent musculoskeletal pelvic pain (including sacroiliac joint dysfunction and piriformis syndrome) with **ALL** of the following ^(10,11):
 - Initial x-ray completed
 - Pain is unresponsive to four (4) weeks of active conservative treatment received within the past six (6) months (physical therapy, chiropractic care or physician supervised home exercise plan (HEP))
- Evaluation of both hips when the patient meets hip CT guidelines (x-ray + persistent pain unresponsive to conservative treatment) for both the right and left hip, Pelvis CT is the preferred study
 - If labral tear is suspected due to a positive anterior impingement sign or posterior impingement sign, then bilateral hip CTs are the preferred studies (not Pelvis CT)
 - If bilateral hip arthrograms are requested and otherwise meet guidelines, bilateral hip MRIs are the preferred studies (not Pelvis CT)
- When non-diagnostic imaging is requested for anatomic guidance for hip surgery, a CT Pelvis is approvable since measurements of both hips may be needed (only one non-diagnostic request can be approved and should include the surgical site)
- Further evaluation of congenital anomalies of the sacrum and pelvis after initial imaging has been performed
- Evaluation of physical or radiological evidence of complex or occult pelvic fracture or for pre-operative planning of complex pelvic fractures

Other Indications

- Diffuse, unexplained lower extremity edema with negative or inconclusive ultrasound ⁽¹²⁾
- Further evaluation of a new onset or non-reducible varicocele ⁽¹³⁾
- Suspected pelvic congestion syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminate ⁽¹⁴⁾
- To locate an intrauterine device after ultrasound and plain x-ray are equivocal or non-diagnostic (imaging of the abdomen may also be indicated) ⁽¹⁵⁾
- Diagnosis or to guide treatment of urachal anomalies when ultrasound is non-diagnostic ⁽¹⁶⁾
- Prior to solid organ transplantation

When MRI is Contraindicated or Cannot Be Performed

- Follow-up of an indeterminate or inconclusive finding on ultrasound limited to the pelvis
- Evaluation of undescended testes in adults and in children, including determination of location of testes, if ordered by a specialist ⁽¹⁷⁾
- Evaluation and characterization of uterine and adnexal masses, (e.g., fibroids, ovaries, tubes, and uterine ligaments) or congenital uterine or renal abnormality where ultrasound has been done previously ⁽¹⁾
- Evaluation of abnormal uterine bleeding when ultrasound findings are indeterminate ⁽¹⁸⁾
 - Age ≤ 50 – Vascular stalk or focal doppler signal on US
 - Age > 50 – Thickened endometrium, vascular stalk or focal doppler signal on US
- Evaluation of uterus prior to and after embolization (CTA may be approved in addition to CT for preprocedural planning) ⁽¹⁹⁾
- Evaluation of endometriosis when preliminary imaging has been completed or to follow up known endometriosis ⁽²⁰⁾
- Further evaluation of suspected adenomyosis when ultrasound is inconclusive, such as the following ⁽²¹⁾:
 - Uterine abnormality on US
 - Anechoic spaces/cysts in myometrium
 - Heterogeneous echotexture
 - Obscured endometrial/myometrial border
 - Sub-endometrial echogenic linear striations
 - Thickening of the transition zone
 - Uterine wall thickening
- Prior to uterine surgery if there is an abnormality suspected on prior ultrasound
- Suspected placenta accreta or percreta when ultrasound is indeterminate ⁽²²⁾
- Further assessment of a scrotal or penile mass when ultrasound is inconclusive ⁽²³⁾
- Investigation of a malfunctioning penile prosthesis
- Suspected urethral diverticula and other imaging is inconclusive ^(24,25)
- Suspected patent urachus or other urachal abnormalities when ultrasound is non-diagnostic ⁽¹⁶⁾
- Transient or episodic hematospermia and age ≥ 40 with negative or inconclusive ultrasound ^(26,27)
- Persistent hematospermia (duration > 1 month, any age) with negative or inconclusive ultrasound ⁽²⁷⁾

Evaluation of Known or Suspected Non-Aortic Vascular Disease

- Follow-up for post-endovascular repair (EVAR) or open repair of iliac artery aneurysms ^(28–30)
 - Routine, baseline study (post-op/intervention) after EVAR:
 - Within the first month of the procedure
 - Continued follow-up at the following intervals:
 - If no endoleak or sac enlargement is seen:
 - ◆ Annually monitor with ultrasound
 - ◇ When US is abnormal or insufficient CT/MR can be used to monitor annually
 - ◆ Every 5 years monitor with CT/MR
 - If type II endoleak is seen at any point in time:
 - ◆ Every 6 months x 2 years, then annually (does not require US)
- If symptomatic or imaging shows increasing, or new findings related to stent graft – more frequent imaging may be needed

Suspected Malignancy

- Initial evaluation of suspicious pelvic masses/tumors found only in the pelvis by physical exam and ultrasound has been performed

Known Malignancy

- Surveillance: One follow-up exam to ensure no suspicious change has occurred in a tumor in the pelvis. No further surveillance CT unless tumor(s) are specified as highly suspicious, or change was found on exam or last follow-up imaging
- For abnormal incidental pelvic lymph nodes when follow-up is recommended based on prior imaging (initial 3-month follow-up) ⁽³¹⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

COMBINATION STUDIES FOR KNOWN GENETIC CONDITIONS

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest/Abdomen/Pelvis CT

- Multiple Endocrine Neoplasia type 1 (MEN1): Annually starting at age 8 ^(32,33)

NOTE: Every 3 years include Brain MRI

OTHER COMBINATION STUDIES WITH PELVIS CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Pelvis CTA (or MRA) and Pelvis CT

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽³⁴⁾
- Prior to uterine artery embolization for fibroids ⁽³⁵⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72192, 72193, 72194, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

*Conservative Therapy

This should include a multimodality approach consisting of a combination of active and inactive components. Inactive components, such as rest, ice, heat, modified activities, medical devices, acupuncture and/or stimulators, medications, injections (epidural, facet, bursal, and/or joint, not including trigger point), and diathermy can be utilized. Active modalities may consist of physical therapy, a physician-supervised home exercise program**, and/or chiropractic care.

**Home Exercise Program (HEP)

The following elements are required to meet guidelines for completion of conservative therapy:

- Information provided on exercise prescription/plan **AND**
- Follow-up with member with documentation provided regarding lack of improvement

(failed) after completion of HEP (after suitable 4-week period), or inability to complete HEP due to physical reason - i.e., increased pain, inability to physically perform exercises. (Patient inconvenience or noncompliance without explanation does not constitute “inability to complete” HEP).

- Dates and duration of failed PT, physician-supervised HEP, or chiropractic treatment should be documented in the original office notes or an addendum to the notes.

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Acute Pelvic Pain in the Reproductive Age Group: 2023 Update ⁽¹⁾

Study Design: This document is a guideline update by the American College of Radiology (ACR) focusing on the initial imaging in the reproductive age adult population with acute pelvic pain.

Target Population: The target population includes patients with acute pelvic pain, both with positive and negative beta-human chorionic gonadotropin (b-hCG) levels, and suspected gynecological and non-gynecological etiologies.

Key Factors: The guideline emphasizes the use of transabdominal and transvaginal pelvic ultrasound with Doppler as initial imaging. It also discusses the appropriateness of CT and MRI in different scenarios based on the suspected etiology.

Diagnostic imaging of acute abdominal pain in adults ⁽³⁾

Study Design: This document is a review article that provides evidence-based guidelines for the diagnostic imaging of acute abdominal pain in adults.

Target Population: The target population includes adults presenting with acute abdominal pain in both outpatient and emergency settings.

Key Factors: The article outlines the appropriate imaging modalities based on the location of pain and clinical presentation. It highlights the use of ultrasonography for right upper quadrant pain, CT for right or left lower quadrant pain, and the limited diagnostic value of conventional radiography.

ACR Appropriateness Criteria® Hernia ⁽⁷⁾

Study Design: This document is a guideline by the ACR focusing on the initial imaging of suspected abdominopelvic hernias.

Target Population: The target population includes adults with signs or symptoms prompting suspicion of abdominopelvic hernia.

Key Factors: The guideline discusses the use of CT, ultrasound, and MRI as first-line imaging modalities for evaluating hernias. It also addresses the appropriateness of different imaging techniques based on the type of hernia suspected.

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽²⁹⁾

Study Design: This document is a comprehensive guideline by the American College of Cardiology (ACC) and American Heart Association (AHA) for the diagnosis and management of aortic disease.

Target Population: The target population includes patients with aortic disease across multiple clinical presentation subsets (asymptomatic, stable symptomatic, and acute aortic syndromes).

Key Factors: The guideline covers various aspects such as genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance. It emphasizes the role of multidisciplinary aortic teams and shared decision-making in the management of aortic disease.

ANALYSIS OF EVIDENCE

Analysis ^(1,3,7,29):

In summary, CT with contrast is widely recognized for its diagnostic accuracy and detailed anatomical assessment in various conditions affecting the pelvis. However, considerations such as radiation exposure and the specific clinical context (e.g., pregnancy, type of condition) influence the choice of imaging modality.

Shared Conclusions:

- **CT with Contrast:** All articles agree that CT with contrast is highly valuable for detailed anatomical assessment and is appropriate for evaluating various conditions, including acute pelvic pain, hernias, and aortic disease.
- **Sensitivity and Specificity:** CT is consistently noted for its high sensitivity and specificity in diagnosing conditions such as appendicitis, diverticulitis, and hernias.
- **Radiation Exposure:** There is a shared concern about radiation exposure, particularly in reproductive-age women and pregnant patients.

POLICY HISTORY

Date	Summary
July 2025	Added a Summary of Evidence and Analysis of Evidence
June 2025	- This guideline replaces Evolent Clinical Guideline 036 for Pelvis CT - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Revised purpose - Hernia and musculoskeletal pelvic pain sections revised - Genetics imaging and malignancy sections revised - Updated language in the preoperative/postoperative section - Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated - Applicable Line of Business adjusted – Medicare checked - References updated
June 2024	- Revised the purpose - Clarified contraindications vs MRI and CT use - Combination studies were aligned across other guidelines

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2045 for Pelvis Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2045	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Pelvis Magnetic Resonance Imaging (MRI) generates images of the organs and structures within the pelvis without the use of ionizing radiation.

Special Note

- There is not an Abdomen Pelvis MRI combo (comparable to a CT Abdomen/Pelvis). If imaging of both the abdomen and pelvis are indicated, two separate exams (and authorization) are required (i.e., MRI Abdomen and MRI Pelvis)
- For evaluating the placenta or imaging the maternal pelvis without need for fetal assessment, use the Pelvic MRI guideline. When assessment of the fetus is needed, see Evolent Clinical Guideline 2027 for Fetal MRI for indications.

INDICATIONS FOR PELVIC MRI

Inflammation and Infection

- For evaluation of Inflammatory Bowel Disease (IBD) such as Crohn's or Ulcerative Colitis (includes MR Enterography) ^(1,2)
 - For suspected inflammatory bowel disease after complete work up including physical exam, labs, and recent colonoscopy
 - Known inflammatory bowel disease with recurrence or worsening signs/symptoms requiring re-evaluation or for monitoring therapy
- Perianal disease ^(3–5)

- Suspected perianal fistula or occult anorectal abscess ⁽⁶⁾
- For patients with recurrent fistula in anal or perianal Crohn's disease ⁽⁷⁾
- Any history of fistula limited to the pelvis that requires re-evaluation or is suspected to have recurred
- Infection
 - Suspected infection in the pelvis (based on elevated WBC, fever, anorexia, or nausea and vomiting)
 - Complications of diverticulitis limited to the pelvis (prior imaging study is not required for diverticulitis diagnosis) with severe abdominal pain or severe tenderness or mass, not responding to antibiotic treatment
 - Any known infection to have created an abscess in the pelvis that requires re-evaluation
- Stricture
 - Suspected urethral stricture or periurethral pathology after initial evaluation with cystoscopy or urethroscopy and additional imaging is needed (such as for suspected malignancy, diverticula, fistula or extensive fibrosis **OR** for preoperative planning) ⁽⁸⁾

For Inflammation and Infection When CT is Contraindicated or Cannot Be Performed

- Any known infection that is clinically suspected to have created an abscess in the pelvis
- Abnormal fluid collection limited to the abdomen seen on prior imaging that needs follow-up evaluation
- Suspected peritonitis when abdominal pain and tenderness to palpation are present, and at **LEAST** one of the following ⁽⁵⁾:
 - Rebound, guarding or rigid abdomen, **OR**
 - Severe tenderness to palpation over the entire abdomen
- Complications of diverticulitis (diagnosed either clinically or by imaging) with severe abdominal pain, severe tenderness, or mass that is not responding to antibiotic treatment)

Hernia ⁽⁹⁾

- Suspected athletic pubalgia (sports hernia) in a patient with persistent groin pain that occurs with exertion, who has not responded to active conservative treatment for four weeks, when prior imaging (ultrasound or CT) is inconclusive
- Suspected hernia and CT is inconclusive, contraindicated or cannot be performed and one of the following:
 - Deep pelvic hernia (obturator, sciatic or perineal)
 - Groin (e.g. inguinal or femoral), occult or incisional hernia **AND** exam and ultrasound are non-diagnostic or equivocal

- Known or suspected inguinal, obturator, sciatic perineal hernia with suspected complications based on one or more of the following:
 - Symptoms such as severe pain, vomiting, diarrhea or blood in stool
 - Exam findings such as inability to reduce hernia, severe tenderness, guarding, rebound
 - Complication is suggested on prior imaging
- Known pelvic or groin hernia, imaging is needed for surgical planning and clinical reason MRI is being requested rather than CT

Musculoskeletal Indications

- Initial evaluation of suspicious mass/tumor of the bones, muscles or soft tissues of the pelvis found on an imaging study, and needing clarification, or found by physical exam and after x-ray or ultrasound is completed
- Evaluation of suspected fracture and/or injury when initial imaging is completed or for confirmed stress (fatigue) fracture for 'return to play' evaluation ⁽¹⁰⁾
- For evaluation of known or suspected aseptic/avascular necrosis of hip(s) after completion of initial x-ray ⁽¹¹⁾
- Known or suspected sacroiliitis (infectious or inflammatory) after completion of x-ray and rheumatologic workup ⁽¹²⁾
- For evaluating the lumbosacral plexus ⁽¹³⁾ with any **ONE** of the following:
 - Confirm involvement in symptomatic patients with known tumor
 - Assess extent of injuries in the setting of pelvic trauma
 - Exclude the presence of masses in patients with unilateral changes, or inconclusive or abnormal findings on EMG when there are persistent symptoms
 - Evaluation when lumbar spine MRI is suspicious or indeterminate
- Suspicion of pudendal neuralgia in the setting of chronic pelvic pain with genital numbness and erectile dysfunction when other causes have been ruled out (see Background regarding diagnosis) ⁽¹⁴⁾
- Suspicion of meralgia paresthetica when prior testing is inconclusive (diagnostic nerve block; electrodiagnostic testing; **AND** somatosensory evoked potentials) ⁽¹⁵⁾
- Persistent musculoskeletal pelvic pain (including sacroiliac joint dysfunction and piriformis syndrome) with **ALL** of the following ^(16,17):
 - Initial x-ray completed
 - Pain is unresponsive to four (4) weeks of active conservative treatment received within the past six (6) months (physical therapy, chiropractic care or physician supervised home exercise plan (HEP))
- Evaluation of both hips when the patient meets hip MRI guidelines (x-ray + persistent pain unresponsive to conservative treatment) for both the right and left hip, Pelvis MRI is

the preferred study.

- If labral tear is suspected due to a positive anterior impingement sign or posterior impingement sign, then bilateral hip MRIs are the preferred studies (not Pelvis MRI)
- If bilateral hip arthrograms are requested and otherwise meet guidelines, bilateral hip MRIs are the preferred studies (not Pelvis MRI)
- For further evaluation of congenital anomalies of the sacrum and pelvis and initial imaging has been performed

Other Indications

- Chronic pelvic pain syndrome once after initial workup including imaging (such as ultrasound and endoscopy) and laboratory evaluation does not reveal a clear cause
- Evaluation of undescended testes in adults and in children, including determination of location of testes, if ordered by a specialist ⁽¹⁸⁾
- Evaluation and characterization of uterine and adnexal masses, (e.g., fibroids, ovaries, tubes, and uterine ligaments) or congenital uterine or renal abnormality where ultrasound has been done previously ⁽¹⁹⁾
- Evaluation of abnormal uterine bleeding when ultrasound findings are indeterminate ⁽²⁰⁾
 - Age ≤ 50 – Vascular stalk or focal doppler signal on US
 - Age > 50 – Thickened endometrium, vascular stalk or focal doppler signal on US
- Evaluation of uterus prior to and after embolization ⁽²¹⁾
- Evaluation of endometriosis when preliminary imaging has been completed or to follow up known endometriosis ⁽²²⁾
- Further evaluation of suspected adenomyosis when ultrasound is inconclusive, such as the following ⁽²³⁾:
 - Uterine abnormality on US
 - Anechoic spaces/cysts in myometrium
 - Heterogeneous echotexture
 - Obscured endometrial/myometrial border
 - Sub-endometrial echogenic linear striations
 - Thickening of the transition zone
 - Uterine enlargement
 - Uterine wall thickening
- Prior to uterine surgery if there is an abnormality suspected on prior ultrasound
- Suspected placenta accreta or percreta when ultrasound is indeterminate ⁽²⁴⁾
- Elevated CA-125 with abnormal or indeterminate ultrasound ⁽²⁵⁾
- Further assessment of a scrotal or penile mass when ultrasound is inconclusive ⁽²⁶⁾

- Investigation of a malfunctioning penile prosthesis
- Suspected urethral diverticulum and other imaging (ultrasound) is inconclusive **OR** for surgical planning **OR** with findings on exam or cystoscopy that are highly suggestive of urethral diverticulum (i.e., ostia on cystoscopy or tender cystic lesion on anterior vaginal wall overlying the urethra) ^(27,28)
- Suspected pelvic congestion syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminate ⁽²⁹⁾
- Pelvic pain when a gynecologic cause is suspected after initial imaging (ultrasound and/or CT) and laboratory evaluation has been completed ⁽¹⁹⁾
- Suspected patent urachus or other urachal abnormalities when ultrasound is non-diagnostic ⁽³⁰⁾
- MR defecography for suspected structural cause of defecatory outlet obstruction to confirm diagnosis if other testing is equivocal (anorectal manometry and balloon expulsion testing) ⁽³¹⁾
- Transient or episodic hematospermia and age ≥ 40 with negative or inconclusive ultrasound ^(32,33)
- Persistent hematospermia (duration > 1 month, any age) with negative or inconclusive ultrasound ⁽³³⁾

When CT is Contraindicated or Cannot be Performed

- Persistent abdominal/pelvic pain after initial laboratory evaluation and either ultrasound and/or scope has been completed and does not reveal a cause
- Fever of unknown origin (temperature of ≥ 101 degrees for a minimum of 3 weeks) after **ALL** of the following have been completed and a source is not identified: complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, serologic testing (EBV, EMV, HIV and hepatitis), tuberculin test
- Any B-symptoms of fevers more than 101° F, drenching night sweats, or unexplained weight loss of more than 10% of body weight over 6 months with documented concern for lymphoma/malignancy ⁽³⁴⁾
- Weight loss: **ONE** of the following:
 - Clinically significant unintentional weight loss i.e., $\geq 5\%$ of body weight in less than 12 months (or $\geq 2\%$ in one month), with signs or symptoms suggestive of an abdominal cause
- Ongoing unexplained clinically significant weight loss i.e., $\geq 5\%$ of body weight in less than 12 months (or $\geq 2\%$ in one month) ⁽³⁵⁾ after initial workup (chest x-ray, age appropriate cancer screening (such as colonoscopy and mammography) and labs (including CBC, CMP, HbA1C, TSH, stool hemoccult, ESR/CRP, HIV, Hepatitis C)) has been completed, no cause identified, and second visit documenting further decline in weight. ⁽³⁶⁾ Suspected or known retroperitoneal fibrosis after workup complete workup and ultrasound to determine extent of disease. ^(37,38)

- Suspected paraneoplastic syndrome (including dermatomyositis) with high suspicion of abdominal malignancy and appropriate workup has been done ⁽³⁹⁾
- Suspected Pheochromocytoma/Paraganglioma with elevated plasma or urine metanephrines and/or normetanephrines
- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause ⁽⁴⁰⁾
- Further evaluation of a new onset or non-reducible varicocele ⁽⁴¹⁾
- Prior to Bone Marrow Transplant (BMT) ^(42,43)
- Follow-up of abnormal lymph nodes with no prior history of malignancy
 - Follow-up imaging at 3 months ⁽⁴⁴⁾

Suspected Malignancy

Suspected Prostate Cancer ^(45,46)

- Prior to prostate biopsy when notes indicate that biopsy is planned ⁽⁴⁷⁾
- In individuals with previous negative biopsy and ongoing concerns of increased risk of prostate cancer (i.e., rising or persistently elevated PSA **OR** suspicious digital rectal exam (DRE))
- For evaluation of elevated PSA (on two separate levels) when PI-RADS classification needed to make decision on whether or not to perform a biopsy when **ALL** of the following has been provided ⁽⁴⁶⁾:
 - Digital rectal examination (DRE) findings
 - PSA elevation not attributed to benign disease
 - Biopsy has been discussed with the patient (Typically, this request would be from the person performing the biopsy (i.e., urologist) and imaging done at the facility where the fusion biopsy would be performed should a higher risk lesion be identified.)
- For evaluation of a very suspicious prostate nodule on exam when biopsy is under consideration ⁽⁴⁶⁾
- Follow up MRI can be approved at the following intervals ^(48,49):
 - PI-RADS 3-5 lesions: 12-month interval
 - PI-RADS 1-2 lesions: 24-month interval
 - Earlier for PI-RADS 1-2 if biopsy is clearly planned, progressive rise in PSA or other risk factors exist

Known Malignancy

NOTE: For malignancies in the pelvis, pelvis MRI is appropriate in addition to other systemic imaging (CT or PET) in the situations described below

Initial Staging or Recurrence

- Pelvis MRI is indicated (if not previously done) for the following malignancies:
 - Anal Carcinoma ⁽⁵⁰⁾
 - Cervical Cancer ⁽⁵¹⁾
 - Colon or Rectal Cancer ⁽⁵²⁾
 - Gestational Trophoblastic Neoplasia ⁽⁵³⁾
 - Ovarian Cancer ⁽⁵⁴⁾
 - Pediatric Solid Tumors ⁽⁵⁵⁾
 - Penile Cancer ⁽⁵⁶⁾
 - Prostate Cancer ⁽⁴⁶⁾
 - Sarcoma in the pelvis (soft tissue or bone) ⁽⁵⁷⁾
 - Uterine Neoplasms ⁽⁵¹⁾
 - Vulvar Cancer ⁽⁵⁸⁾
- For all other malignancies, Pelvis MRI is indicated for surgical or radiation planning or to clarify indeterminate findings on CT

Restaging

- Pelvis MRI is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the following malignancies:
 - Anal Carcinoma ⁽⁵⁰⁾
 - Colon or Rectal Cancer ⁽⁵²⁾
 - Ovarian Cancer ⁽⁵⁴⁾
 - Pediatric Solid Tumors ⁽⁵⁵⁾
 - Prostate Cancer ⁽⁴⁶⁾:
 - When recurrence is suspected
 - Sarcoma in the pelvis (soft tissue or bone) ⁽⁵⁷⁾
 - Uterine Cancer ⁽⁵¹⁾
 - Vulvar Cancer ⁽⁵⁸⁾
- For all other malignancies, Pelvis MRI is indicated for surgical or radiation planning or to clarify indeterminate findings on CT

Surveillance

- Cervical cancer: as clinically indicated ⁽⁵¹⁾
- Ovarian Cancer: every 3-6 months for 2 years then every 6-12 months for 3 years ⁽⁵⁴⁾
- Pediatric solid tumors: as clinically indicated (frequent imaging is appropriate) ⁽⁵⁵⁾
- Prostate Cancer: Annually if on active surveillance ⁽⁴⁶⁾
- Rectal Cancer: every 3-6 months for 2 years, every 6-12 months for 5 years ⁽⁵⁹⁾
- Sarcoma in the pelvis (soft tissue or bone): Every 3-6 months for 5 years, then annually for 5 years ⁽⁵⁷⁾
- For other cancers not listed above, Pelvis MRI is not typically used during surveillance, however, can be considered on a case to case basis

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- BHDS (Birt-Hogg-Dube): annually starting at age 20 (or earlier with family history of

renal tumors diagnosed before age 30) ^(60,61)

- FAP (Familial Adenomatous Polyposis): annual ⁽⁶²⁾
- Multiple Endocrine Neoplasia type 1 (MEN1): annually starting at age 8 ^(63,64)
- STK11 (Peutz-Jeghers Syndrome): at diagnosis, annually starting at age 8 ⁽⁶⁵⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination studies for known genetic conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Chest/Abdomen/Pelvis MRI ^(63,64)

- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1)
 - Annually starting at age 8
 - Every 3 years include Brain MRI

OTHER COMBINATION STUDIES WITH PELVIS MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen/Pelvis MRI

- As a dedicated CPT code does not exist for Abdomen and Pelvis MRI (unlike CT), when a disease process is reasonably expected to involve both the abdomen and pelvis **AND** the guideline criteria have been met, two separate authorizations are required: Abdomen MRI (CPT 74181, 74182, 74183) and Pelvis MRI (CPT 72195, 72196, 72197).

Pelvis MRI and Pelvis MRA

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽⁶⁶⁾
- Prior to uterine artery embolization for fibroids ⁽⁶⁷⁾

Pelvis MRI and Fetal MRI

- When medical necessity has been met for Pelvis MRI (such as for suspected placenta accreta or percreta when ultrasound is indeterminate ⁽²⁴⁾ **AND** medical necessity has been met for Fetal MRI (such as suspected fetal abnormality after ultrasound has been performed), two separate authorizations are required: Pelvis MRI (CPT 72195) and Fetal

MRI (CPT 74712).

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

72195, 72196, 72197, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

PI-RADS Assessment Categories for Prostate Cancer

The assignment of a PI-RADS category is based on MRI findings only and does not incorporate other factors, including PSA testing, DRE (digital rectal exam), or clinical history.

- PI-RADS 1 – Very low (clinically significant cancer is highly unlikely to be present)
- PI-RADS 2 – Low (clinically significant cancer is unlikely to be present)
- PI-RADS 3 – Intermediate (the presence of clinically significant cancer is equivocal)
- PI-RADS 4 – High (clinically significant cancer is likely to be present)
- PI-RADS 5 – Very high (clinically significant cancer is highly likely to be present)

Conservative Therapy

Conservative therapy should include a multimodality approach consisting of a combination of active and inactive components. Completion of at least one active modality for 4 weeks in the past 6 months is required:

Active Modalities

- Physical therapy
- Physician-supervised home exercise program (HEP) (See Below)
- Chiropractic care

Inactive Modalities

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections
- Medical Devices (e.g., TENS unit, bracing)

Home Exercise Program (HEP)

The following two elements are required to meet guidelines for completion of conservative therapy:

- Information provided on exercise prescription/plan AND
- Follow-up with patient with documentation provided regarding completion of HEP over at least a 4-week period **OR** documented inability to complete HEP due to increased pain with inability to physically perform the prescribed exercises.

NOTE: Patient inconvenience or noncompliance without explanation does not meet the “inability to complete HEP” criterium

MRI and Lumbosacral Plexopathy

Complete lumbar (L1-L4) or sacral plexopathy (L5-S3) may present with weakness, sensory loss, and flaccid loss of tendon reflexes. Clinical diagnosis is confirmed by EMG. Acute and chronic plexopathies may be caused by nerve sheath tumors; infectious, autoimmune, hereditary, or idiopathic neuropathies; extrinsic compression; or trauma. There is no CPT® code specifically for imaging of the LS plexus.

Pudendal neuralgia may be considered in chronic pain patients who meet the Nantes criteria: pain in the area innervated by the pudendal nerve, pain more severe with sitting, pain that does not awaken the patient from sleep, pain with no objective sensory impairment, and pain relieved by pudendal block. All five criteria must be met for diagnosis.

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on

trimester)

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Diagnostic imaging of acute abdominal pain in adults ⁽³⁾

- **Study Design:** This document is a review article that provides evidence-based guidelines for the diagnostic imaging of acute abdominal pain in adults.
- **Target Population:** The target population includes adults presenting with acute abdominal pain in both outpatient and emergency settings.
- **Key Factors:** The article outlines the appropriate imaging modalities based on the location of pain and clinical presentation. It highlights the use of ultrasonography for right upper quadrant pain, CT for right or left lower quadrant pain, and the limited diagnostic value of conventional radiography.

ACR Appropriateness Criteria® Hernia ⁽⁹⁾

- **Study Design:** This document is a guideline by the ACR focusing on the initial imaging of suspected abdominopelvic hernias.
- **Target Population:** The target population includes adults with signs or symptoms prompting suspicion of abdominopelvic hernia.
- **Key Factors:** The guideline discusses the use of CT, ultrasound, and MRI as first-line imaging modalities for evaluating hernias. It also addresses the appropriateness of different imaging techniques based on the type of hernia suspected.

ACR Appropriateness Criteria® Acute Pelvic Pain in the Reproductive Age Group: 2023 Update ⁽¹⁹⁾

- **Study Design:** This document is a guideline update by the American College of Radiology (ACR) focusing on the initial imaging in the reproductive age adult population with acute pelvic pain.
- **Target Population:** The target population includes patients with acute pelvic pain, both with positive and negative beta-human chorionic gonadotropin (b-hCG) levels, and suspected gynecological and non-gynecological etiologies.
- **Key Factors:** The guideline emphasizes the use of transabdominal and transvaginal pelvic ultrasound with Doppler as initial imaging. It also discusses the appropriateness of CT and MRI in different scenarios based on the suspected etiology.

ANALYSIS OF EVIDENCE

Analysis ^(3,9,19):

In summary, while there is consensus on the utility of MRI in specific scenarios, the recommendations vary based on the clinical context and the specific condition being evaluated. MRI is generally considered a valuable imaging modality, particularly when other methods are inconclusive or not suitable.

Shared Conclusions

- **MRI as a Secondary Option:** All three articles agree that MRI is often a secondary option when other imaging modalities (like ultrasound or CT) are inconclusive or not feasible.
- **Use of Contrast:** The use of IV contrast in MRI is a common consideration across the articles, with specific recommendations varying based on the clinical scenario.
- **Pregnancy Considerations:** MRI is preferred for pregnant patients due to the lack of ionizing radiation.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This guideline replaces Evolent Clinical Guideline 037 for Pelvis MRI ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Fistula and inflammation section revised ● Hernia and musculoskeletal pelvic pain section revised ● Genetics imaging and malignancy sections updated ● Applicable Line of Business adjusted – Medicare checked ● Updated language in the preoperative/postoperative section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Background section shortened and integrated into indications ● References updated

Date	Summary
June 2024	● Revised the purpose ● Clarified when to use Fetal MRI and Pelvis MRI ● Made Inflammation and Infection section to re-organize information ● Clarified gynecologic reasons of why MRI vs CT ● Prostate Cancer condensed in the suspected section ● Known Malignancy was adjusted to follow same organization as other guidelines ● Genetics and Rare Diseases was adjusted/added ● Combination studies were adjusted to align across Guidelines

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Clinical Services Guideline Review Committee

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Evolut Clinical Guideline 2044 for Pelvis Magnetic Resonance Angiography (MRA)

Guideline Number: Evolut_CG_2044	<u>Applicable Codes</u>	
<i>"Evolut" refers to Evolut Health LLC and Evolut Specialty Services, Inc.</i> <i>© 2008 - 2026 Evolut. All rights Reserved.</i>		
Original Date: May 2008	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) generates images of the blood vessels (both arteries and veins) that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. It is used to evaluate the blood vessels of the pelvis.

Special Note

When the criteria for imaging of peripheral vascular disease are met (see relevant guidelines), two separate authorizations are required: Abdomen MRA (CPT 74185) and one Lower Extremity MRA (CPT 73725). This will provide imaging of the abdomen, pelvis and both legs. A separate Pelvis MRA authorization is **NOT** required. Only one Lower Extremity MRA is required (not two).

INDICATIONS FOR PELVIS MRA

Abdominal Aortic Disease

Abdominal Aortic Aneurysm

- Suspected or known **asymptomatic** Abdominal Aortic Aneurysm (AAA) with **ALL** of the following:
 - Prior ultrasound is inconclusive or insufficient
 - A reason MRA is needed rather than CT has been provided (e.g., complex vascular anatomy or suspected complications)
 - The study is ordered at the appropriate AAA surveillance interval ⁽¹⁾:

- Aneurysm size 2.5-3 cm, every 10 years
- Aneurysm size 3.0-3.9 cm, every 3 years
- Aneurysm size 4.0-4.9 cm, annually
- Aneurysm size 5.0-5.4 cm, every 6 months
- Known or suspected **symptomatic AAA** ^(1,2)
 - Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate possible aneurysm rupture)
 - Acute abdominal or back pain with a pulsatile or epigastric mass
 - Acute abdominal or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, connective tissue disorder (e.g., Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome), and bicuspid aortic valve) ⁽³⁾

Aortic Syndromes

For initial diagnosis of suspected and follow-up of known aortic syndromes, including aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer

- Frequency for follow up is as clinically indicated

Postoperative Follow-up of Aortic Repair ^(1,2)

Follow-up for post-endovascular repair (EVAR) or open repair of AAA or abdominal extent of iliac artery aneurysms at the following intervals (CT preferred for routine follow-up):

- Routine, baseline post-EVAR study when a reason MRA rather than CT is needed has been provided (such as complex anatomy or suspected complications with any **ONE** of the following):
 - Within one month of procedure
 - Continued follow up imaging at the following intervals:
 - If no endoleak or sac enlargement is seen:
 - Annually with past inconclusive or insufficient ultrasound
 - Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
 - If type II endoleak or sac enlargement is seen at any point in time (US not needed):
 - Every 6 months x 2 years, then annually (does not require US)
- Routine follow up after open repair of AAA when a reason MRA is needed rather than CT has been provided (e.g., complex vascular anatomy or suspected complications) with and **ONE** of the following ⁽¹⁾:

- Within 1 year postoperatively then
- Annually with past inconclusive or insufficient ultrasound
- Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
- If symptomatic or imaging shows increasing, or new findings related to stent graft – more frequent imaging may be needed as clinically indicated
- Suspected complication (such as new-onset lower extremity claudication, ischemia, or reduction in ABI after aneurysm repair)
- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, such as pseudoaneurysms, related to surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity

Ischemia or Hemorrhage

- To determine the vascular source of retroperitoneal hematoma or hemorrhage when CT is insufficient to determine the source and CTA is **contraindicated or cannot be performed**; (CT rather than MRA/CTA is the modality of choice for diagnosing hemorrhage) ⁽⁴⁾
- Evaluation of known or suspected mesenteric ischemia/ischemic colitis when CTA is **contraindicated or cannot be performed** ⁽⁵⁾

Other Vascular Abnormalities of the Pelvis

- Initial evaluation of inconclusive vascular findings on prior imaging
- For evaluation or monitoring of non-aortic large vessel pelvic vascular disease (such as aneurysm, dissection, arteriovenous malformations (AVM), vascular fistula, intramural hematoma, compression syndromes and vasculitis) and the findings are reasonably expected to be limited to the pelvis ⁽⁶⁾
- For assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography ^(7,8)
- Suspected complications of known aneurysm as evidenced by clinical findings such as new onset of pelvic pain
- For patients with fibromuscular dysplasia (FMD) ^(9,10):
 - One-time vascular study from brain to pelvis
- Takayasu's Arteritis ⁽¹¹⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Venous Disease

- Suspected pelvic congestive syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminant (no contraindication to CT is needed) ⁽¹²⁾
- For acute unilateral (or symmetric) lower extremity edema with negative or inconclusive doppler US and CT ⁽¹³⁾
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause when Abdomen and Pelvis CT (or Pelvis CT) is negative or inconclusive ⁽¹³⁾
- Venous thrombosis (including inferior vena cava thrombosis) if previous studies (such as ultrasound) have not resulted in a clear diagnosis ^(14,15)
- For pregnant women with suspected deep venous thrombosis (DVT) (including suspected extension to the iliac vein) after compression ultrasound ⁽¹⁶⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor ⁽¹⁷⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When otherwise specified in the guideline:

Preoperative Evaluation:

- Evaluation prior to interventional vascular for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation prior to endovascular aneurysm repair (EVAR) ⁽¹⁹⁾
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) CTA is **contraindicated or cannot be performed** ⁽²⁰⁾
- For imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery ⁽¹⁸⁾
- Evaluation of vascular anatomy prior to solid organ transplantation
- Prior to uterine artery embolization for fibroids ⁽²¹⁾
- For evaluation of erectile dysfunction when a vascular cause is confirmed by doppler ultrasound, revascularization is planned and there is a contraindication to selective internal pudendal angiography (SIPA) ⁽²²⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation

- Follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that

clearly indicates why additional imaging is needed for the type and area(s) requested.

- Endovascular/interventional vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Post-operative complications (e.g., pseudoaneurysms related to surgical bypass grafts, vascular stents, and stent-grafts in the pelvis)
- Post-operative complications of renal transplant allograft ⁽²³⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING OF KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁴⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities
- Marfan syndrome ⁽²⁵⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Loeys-Dietz ⁽²⁶⁾:
 - Every two years (including at diagnosis)
 - More frequently if abnormalities are found
- Williams Syndrome ⁽²⁷⁾:

- Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of thoracic aortic stenosis)
- Neurofibromatosis Type 1 (NF-1) ⁽²⁸⁾:
 - Development of hypertension (including concern for renal artery stenosis)
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study AND conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest/Abdomen/Pelvis MRA

- Marfan syndrome ⁽²⁵⁾
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Williams Syndrome ⁽²⁷⁾
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Vascular Ehlers-Danlos syndrome: At diagnosis and then every 18 months; more frequently if abnormalities are found ⁽²⁴⁾
- Loeys-Dietz: at diagnosis and then every two years, more frequently if abnormalities are found ⁽²⁶⁾

OTHER COMBINATION STUDIES WITH PELVIS MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen/Pelvis MRA

- As a dedicated CPT code does not exist for Abdomen and Pelvis MRA, when a disease process is reasonably expected to involve both the abdomen and pelvis **AND** the guideline criteria have been met, two separate authorizations are required: Abdomen MRA (CPT code 74185) and Pelvis MRA (CPT 72198)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis is indicated ^(9,10)
- For assessment in patients with spontaneous coronary artery dissection (SCAD), (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)) can be done at time of coronary angiography ⁽⁷⁾

NOTE: Body vascular imaging for SCAD can be performed at the time of coronary angiography

Chest/Abdomen/Pelvis MRA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present when CTA is contraindicated or cannot be performed ⁽¹⁹⁾
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) when CTA is **contraindicated or cannot be performed** ⁽²⁰⁾
- Acute aortic dissection ⁽²⁹⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Chest/Abdomen/Pelvis/Lower Extremity MRA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease
 - **NOTE:** Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli.

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Takayasu's Arteritis ⁽¹¹⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Pelvis MRA and Pelvis MRI (or CT)

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽³⁰⁾
- Prior to uterine artery embolization for fibroids ⁽³¹⁾

CODING AND STANDARDS

Codes

72198

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽¹⁾

Study Design: This document is a guideline report from the American Heart Association (AHA) and American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It provides recommendations for the diagnosis and management of aortic disease based on a comprehensive literature search and evidence review.

Target Population: The guidelines are intended for clinicians managing patients with aortic disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors: Recommendations cover genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance. Emphasis on involving patients and multidisciplinary teams in determining optimal therapies, especially for pregnant patients. Guidelines for computed tomography, magnetic resonance imaging, and echocardiographic imaging. Lowered thresholds for surgical intervention in specific scenarios. Importance of institutional volume and expertise in patient outcomes.

ACR Appropriateness Criteria® Radiologic Management of Mesenteric Ischemia: 2022 Update ⁽⁵⁾

Study Design: This is an update on the ACR Appropriateness Criteria for the radiologic management of mesenteric ischemia.

Target Population: Patients with mesenteric ischemia, including acute and chronic cases.

Key Factors: The article discusses various endovascular and surgical interventions for mesenteric ischemia, including embolectomy, thrombolysis, angioplasty, and stent placement. It provides evidence-based guidelines for the appropriate use of these interventions based on the clinical scenario, such as the presence of embolus, atherosclerotic plaque, or venous mesenteric ischemia. The guidelines aim to improve patient outcomes by recommending the most suitable imaging and treatment procedures.

Insights into pelvic venous disorders ⁽¹²⁾

Study Design: This is a review article that focuses on pelvic venous disorders (PeVD), also known as pelvic congestion syndrome (PCS).

Target Population: Mainly young women between the ages of 20 and 50 years, who experience chronic pelvic pain (CPP) due to venous-related symptoms.

Key Factors: The article discusses the multifactorial etiology of PeVD, including genetic predisposition, anatomical abnormalities, and hormonal factors. It emphasizes the importance of imaging in diagnosing PeVD and proposes a new classification scheme to assist clinical decision-making. The review also covers various therapeutic approaches, including minimally invasive techniques, and highlights the need for standardized guidelines for treatment.

ANALYSIS OF EVIDENCE

Analysis ^(1,5,12):

In summary, while all three articles share common themes such as the importance of imaging, multidisciplinary approaches, and minimally invasive techniques, they differ in their specific focus, treatment recommendations, and classification systems. Each article provides valuable insights into the management of their respective conditions, contributing to the overall understanding of vascular disorders.

Shared Conclusions

- **Importance of Imaging and Diagnostic Techniques:** All three articles emphasize the critical role of imaging in diagnosing and managing vascular conditions. Discusses the

use of CT, MRI, and echocardiography for aortic disease. Highlights the use of CT, MRI, and ultrasound for diagnosing mesenteric ischemia. Focuses on various imaging modalities like ultrasound, CT, and MRI for diagnosing pelvic venous disorders.

- **Multidisciplinary Approach:** The need for a multidisciplinary team is a common theme. Importance of a multidisciplinary aortic team for optimal patient outcomes, involvement of various specialists in managing mesenteric ischemia, and also advocates for a multidisciplinary approach to manage pelvic venous disorders effectively.
- **Emphasis on Minimally Invasive Techniques:** All three articles highlight the preference for minimally invasive techniques.

POLICY HISTORY

Date	Summary
July 2025	● Adjusted guideline title-name spelled out ● Added a Summary of Evidence and Analysis of Evidence ● Moved further evaluation section below Preop
June 2025	● This guideline replaces Evolent Clinical Guideline 039 for Pelvis MRA/MRV (Angiography/Venography) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Moved AAA screening intervals from background to AAA indications section ● Moved FMD and Takayasu's arteritis to Other Vascular Abnormalities section ● Adjusted the language in the Venous Disease section for pelvic congestion syndrome to include nutcracker syndrome ● Added and adjusted language in the Venous Disease section for acute and chronic unilateral lower extremity edema ● Updated language in the preoperative/postoperative section ● Segment added to the combination's studies about if the required use of conscious sedation is needed the entire combination is indicated ● Genetics section surveillance language adjusted in vEDS, Marfan Syndrome, and Loey's Dietz Syndrome sections ● Combinations Studies for Known Genetic Diseases section was added

Date	Summary
	● Brain added to the Neck/Chest/Abdomen and Pelvis CTA combo with surveillance added to Takayasu's arteritis ● Applicable Line of Business adjusted – Medicare checked ● Background reduced
April 2024	● Separated out aortic syndromes to be more clear ● EVAR studies clarified order of which studies would be ordered ● Renal artery stenosis: updated per new clinical guidance ● Added Genetic Syndromes and Tumors Section ● Statement put in all Guidelines for contraindications put in indications and background sections ● Combo section adjusted and made uniform ● Updated references and background sections

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2063 for Upper Extremity Computed Tomography Angiography (CTA)

Guideline Number: Evolut_CG_2063	<u>Applicable Codes</u>	
<i>"Evolut" refers to Evolut Health LLC and Evolut Specialty Services, Inc.</i> <i>© 2008 - 2026 Evolut. All rights Reserved.</i>		
Original Date: July 2008	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the arteries and veins that can be evaluated for evidence of stenosis, occlusion, or aneurysms. It is used to evaluate the blood vessels of the upper extremities. CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function. Upper Extremity CTA is not used as a screening tool, e.g., evaluation of asymptomatic patients, without a previous diagnosis.

NOTE: Authorization for CT Angiography (CTA) covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

Special Notes

When a separate CTA and CT exam is requested, documentation requires a medical reason that clearly indicates why additional CT imaging of the upper extremity is needed.

INDICATIONS FOR UPPER EXTREMITY COMPUTED TOMOGRAPHY ANGIOGRAPHY (CTA)

Upper Extremity Peripheral Vascular Disease ^(1,2)

- For known or suspected acute upper extremity ischemia with any **ONE** of the following ⁽³⁾:
 - Ischemic ulceration without segmental temperature change
 - Painful ischemic ulceration
 - Acute sustained loss of perfusion with or without acral ulceration

- Imminent loss of digit(s)

NOTE: Does **NOT** require prior ultrasound

- For known or suspected upper extremity vascular disease (including Raynaud's) ⁽⁴⁾ with **ALL** of the following:
 - Prior abnormal or indeterminate ultrasound
 - CTA results will potentially change management
- For upper extremity ulcers on exam from known/suspected peripheral vascular disease **after** prior abnormal or indeterminate ultrasound ^(2,5)
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁶⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the upper extremity
 - Signs or symptoms of upper extremity vascular disease (such as claudication, weak pulses)
- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following ⁽⁷⁾:
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate prior non-invasive testing or imaging

Deep Venous Thrombosis (DVT) ^(8,9)

- For known/suspected upper extremity DVT with **ALL** the following:
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management

Arterial Thromboembolism

- Clinical findings (such as pulselessness, acute limb ischemia) and / or prior imaging suggestive of upper extremity arterial thromboembolism ^(10,11)

NOTE: Echocardiogram and advanced vascular imaging of the chest, abdomen, and/or pelvis may also be indicated to identify the source of the emboli.

Clinical Suspicion of Aneurysm

- With prior abnormal or indeterminate ultrasound or other imaging ⁽¹²⁾

Clinical Suspicion of Vasculitis

- With prior abnormal or indeterminate ultrasound or other imaging ⁽¹²⁾

Hemodialysis Graft Dysfunction

- If prior ultrasound was completed and not sufficient for required treatment decisions ⁽¹³⁾

Vascular Malformation (VM) ^(14,15)

- For known / suspected upper extremity VM with **ALL** the following:
 - Prior abnormal or indeterminate ultrasound
 - MRA/MRV is contraindicated or not possible
 - Advanced imaging study results will potentially change management
- A concurrent upper extremity CT is also indicated for initial evaluation/preoperative planning if MRI is contraindicated or cannot be performed, or per surgeon preference.

Traumatic Injuries

- Clinical findings (such as bruit, hemorrhage, hematoma, pulselessness) and/or prior imaging suggestive of upper extremity vascular injury ⁽¹⁶⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor after prior imaging (may be approved in combination with CT or MRI of tumor)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline

Preoperative Evaluation:

- Imaging of the area requested is needed to develop by a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification.

- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos Syndrome (vEDS): With inconclusive ultrasound or ultrasound suggestive of vascular pathology **OR** acute extremity pain and concern for dissection/rupture ^(17,18)
- Williams Syndrome: Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽¹⁹⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁶⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the upper extremity
 - Signs or symptoms of upper extremity vascular disease (such as claudication, weak pulses)

CODING AND STANDARDS

Codes

73206

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

CT Angiography of the Upper Extremity Arterial System: Part 2—Clinical Applications Beyond Trauma Patients ⁽¹¹⁾

Study Design: This study focuses on the clinical applications of CT angiography for evaluating the upper extremity arterial system beyond trauma patients. It is a review article published in the American Journal of Roentgenology (AJR) in October 2013.

Target Population: The study primarily targets patients with non-traumatic vascular pathologic abnormalities of the upper extremity arterial system. This includes patients with atherosclerotic disease, thromboembolic disease, vasculitis, and other vascular conditions.

Key Factors:

- **Atherosclerotic Disease:** The study discusses the disproportionate impact of atherosclerotic disease on the upper extremities compared to the lower extremities. It highlights risk factors such as hypertension, dyslipidemia, diabetes mellitus, age, and smoking history.
- **Thromboembolic Disease:** The study notes the decreased incidence of arterial embolism to the extremities due to increased use of anticoagulation. It emphasizes the higher mortality rate associated with peripheral arterial emboli compared to arterial thrombosis.
- **Vasculitis:** The study describes the imaging characteristics of vasculitis affecting the upper extremity vessels, including Takayasu arteritis, giant cell arteritis, and thromboangiitis obliterans.
- **Other Conditions:** The study also covers conditions such as thoracic outlet compression, hypothenar hammer syndrome, and radiation arteritis.

ACR Appropriateness Criteria Nonatherosclerotic Peripheral Arterial Disease ⁽⁶⁾

Study Design: This document outlines the ACR Appropriateness Criteria for nonatherosclerotic peripheral arterial disease. It is a guideline developed by the American College of Radiology (ACR) and published in the Journal of the American College of Radiology in 2019.

Target Population: The guidelines are intended for patients with nonatherosclerotic diseases affecting the peripheral arteries. This includes conditions such as popliteal entrapment syndrome, external iliac artery endofibrosis, inflammatory vasculitides, and vascular trauma.

Key Factors:

- **Diagnostic Imaging:** The guidelines recommend various imaging modalities for initial evaluation, including MRA, CTA, and US duplex Doppler.
- **Clinical Presentation:** The document discusses the clinical presentation of different nonatherosclerotic peripheral arterial diseases and provides recommendations for appropriate imaging studies based on the suspected condition.
- **Treatment Recommendations:** The guidelines offer evidence-based recommendations for imaging and treatment procedures, emphasizing the importance of accurate vascular imaging and nonvascular findings in guiding surgical management.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽²⁾

Study Design: This document presents the 2024 ESC Guidelines for the management of peripheral arterial and aortic diseases. It is developed by the task force of the European Society of Cardiology (ESC) and endorsed by several European associations.

Target Population: The guidelines target patients with peripheral arterial and aortic diseases, including atherosclerotic and nonatherosclerotic conditions. It covers a wide range of topics, from epidemiology and risk factors to diagnostic work-up and treatment strategies.

Key Factors:

- **Epidemiology and Risk Factors:** The guidelines provide detailed information on the prevalence and risk factors associated with peripheral arterial and aortic diseases.
- **Diagnostic Work-Up:** The document outlines the recommended diagnostic tests and imaging modalities for evaluating peripheral arteries and the aorta.
- **Treatment Strategies:** The guidelines offer comprehensive recommendations for medical and interventional treatment of various peripheral arterial and aortic conditions, including chronic limb-threatening ischemia, carotid artery stenosis, and aortic aneurysms.
- **Follow-Up:** The guidelines emphasize the importance of regular follow-up and monitoring for patients with peripheral arterial and aortic diseases.

ANALYSIS OF EVIDENCE

Shared Findings ^(2,6,11):

- **Accuracy and Utility of Angiography:** All three articles emphasize the accuracy and utility of angiography in diagnosing vascular pathologies. Bozlar et al 2013 highlights the use of CT angiography (CTA) for evaluating non-traumatic vascular abnormalities in the upper extremities. Francois et al 2019 discusses the appropriateness of various imaging modalities, including CTA and MRA, for diagnosing nonatherosclerotic peripheral arterial diseases. Mazzolai et al 2024 also underscores the importance of CTA and MRA in

evaluating peripheral arterial and aortic diseases.

- **Non-invasive Nature:** The non-invasive nature of CTA and MRA is a common theme. Bozlar et al 2013 mentions the evolution of CTA into a highly accurate non-invasive diagnostic tool. Francois et al 2019 highlights the non-invasive nature of MRA and CTA in their appropriateness criteria. Mazzolai et al 2024 also discusses the non-invasive benefits of these imaging techniques.
- **Clinical Applications:** All three articles discuss the clinical applications of extremity angiography imaging. Bozlar et al 2013 focuses on the use of CTA in non-traumatic vascular pathologies. Francois et al 2019 provides guidelines for the initial evaluation of various nonatherosclerotic peripheral arterial diseases. Mazzolai et al 2024 offers comprehensive guidelines for managing peripheral arterial and aortic diseases, including the use of imaging.

Conclusion ^(2,6,11):

In summary, while all three articles highlight the importance and accuracy of extremity angiography imaging, they differ in their focus on specific conditions, imaging modalities, and recommendations. Bozlar et al 2013 provides a detailed analysis of CTA's clinical applications in the upper extremities, Francois et al 2019 offers appropriateness criteria for various imaging modalities, and Mazzolai et al 2024 presents comprehensive guidelines for managing peripheral arterial and aortic diseases.

POLICY HISTORY

Date	Summary
June 2025	● Guideline number changed from 061-2 to 2063 ● Guideline name changed from Upper Extremity CTA/CTV to Upper Extremity Computed Tomography Angiography (CTA) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Added non-atherosclerotic PVD to Peripheral Vascular Disease and Genetics Syndromes and Rare Diseases sections ● Broke down clinical suspicion of vascular disease section for clarity ● Standardized preoperative and postoperative assessment and Genetic Syndrome and Rare Diseases sections ● Edited text for clarity and consistency ● Updated references ● Added a Summary of Evidence and Analysis of Evidence

Date	Summary
April 2024	• Updated references • Added Evaluation of Tumor, Genetics Syndromes and Rare Diseases, and Contraindications and Preferred Studies sections.

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2064 for Upper Extremity Magnetic Resonance Angiography (MRA)

Arm, Upper Extremity

Guideline Number: Evolent_CG_2064	<u>Applicable Codes</u>	
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Original Date: July 2008	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) generates images of the blood vessels that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. It is used to evaluate the blood vessels of the upper extremities.

NOTE: Authorization for MR Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

Special Notes

When a separate MRA and MRI exam is requested, documentation requires a medical reason that clearly indicates why additional MRI imaging of the upper extremity is needed.

INDICATIONS FOR UPPER EXTREMITY MAGNETIC RESONANCE ANGIOGRAPHY (MRA)

Upper Extremity Peripheral Vascular Disease ^(1,2)

For evaluation of known or suspected upper extremity vascular disease when **CTA is contraindicated or cannot be performed**:

- For known or suspected acute upper extremity ischemia with any **ONE** of the following ⁽³⁾:
 - Ischemic ulceration without segmental temperature change
 - Painful ischemic ulceration
 - Acute sustained loss of perfusion with or without acral ulceration

- Imminent loss of digit(s)

NOTE: Does **NOT** require prior ultrasound

- For known or suspected upper extremity vascular disease (including Raynaud's) with **ALL** of the following ⁽⁴⁾:
 - Prior abnormal or indeterminate ultrasound
 - MRA results will potentially change management
- For upper extremity ulcers on exam from known/suspected peripheral vascular disease **after** prior abnormal or indeterminate ultrasound ^(2,5)
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁶⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the upper extremity
 - Signs or symptoms of upper extremity vascular disease (such as claudication, weak pulses)
- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following ⁽⁷⁾:
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate prior non-invasive testing or imaging

Deep Venous Thrombosis (DVT) ^(8,9)

- For known/suspected upper extremity DVT with **ALL** the following:
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management
 - CTA is contraindicated or cannot be performed

Arterial Thromboembolism

- Clinical findings (such as pulselessness, acute limb ischemia) and/or prior imaging suggestive of upper extremity arterial thromboembolism when CTA is contraindicated or cannot be performed ^(10,11)

NOTE: Echocardiogram and advanced imaging of the chest, abdomen, and/or pelvis may also be indicated to identify the source of the emboli.

Clinical Suspicion of Aneurysm

- With prior abnormal or indeterminate ultrasound or other imaging when CTA is contraindicated or cannot be performed ⁽¹²⁾

Clinical Suspicion of Vasculitis

- With prior abnormal or indeterminate ultrasound or other imaging when CTA is contraindicated or cannot be performed ⁽¹²⁾

Hemodialysis Graft Dysfunction

- If prior ultrasound was completed and not sufficient for required treatment decisions ⁽¹³⁾

Vascular Malformation (VM) ^(14,15)

- For known / suspected upper extremity VM with **ALL** the following:
 - Prior abnormal or indeterminate ultrasound
 - Advanced imaging study results will potentially change management
- A concurrent upper extremity MRI is also indicated in addition to MRA for initial evaluation/preoperative planning or by surgeon preference.

Traumatic Injuries

- Clinical findings (such as bruit, hemorrhage, hematoma, pulselessness) and/or prior imaging suggestive of upper extremity vascular injury when CTA is contraindicated or cannot be performed ⁽¹⁶⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor after prior imaging (may be approved in combination with CT or MRI of tumor)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos Syndrome (vEDS): With inconclusive ultrasound or ultrasound suggestive of vascular pathology **OR** acute extremity pain and concern for dissection/rupture ^(17,18)
- Williams Syndrome: Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽¹⁹⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁶⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the upper extremity
 - Signs or symptoms of upper extremity vascular disease (such as claudication, weak pulses)

CODING AND STANDARDS

Codes

73225

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

CT Angiography of the Upper Extremity Arterial System: Part 2—Clinical Applications Beyond Trauma Patients ⁽¹¹⁾

Study Design: This study focuses on the clinical applications of CT angiography for evaluating the upper extremity arterial system beyond trauma patients. It is a review article published in the American Journal of Roentgenology (AJR) in October 2013.

Target Population: The study primarily targets patients with non-traumatic vascular pathologic abnormalities of the upper extremity arterial system. This includes patients with atherosclerotic disease, thromboembolic disease, vasculitis, and other vascular conditions.

Key Factors:

- **Atherosclerotic Disease:** The study discusses the disproportionate impact of atherosclerotic disease on the upper extremities compared to the lower extremities. It highlights risk factors such as hypertension, dyslipidemia, diabetes mellitus, age, and smoking history.
- **Thromboembolic Disease:** The study notes the decreased incidence of arterial embolism to the extremities due to increased use of anticoagulation. It emphasizes the higher

mortality rate associated with peripheral arterial emboli compared to arterial thrombosis.

- **Vasculitis:** The study describes the imaging characteristics of vasculitis affecting the upper extremity vessels, including Takayasu arteritis, giant cell arteritis, and thromboangiitis obliterans.
- **Other Conditions:** The study also covers conditions such as thoracic outlet compression, hypothenar hammer syndrome, and radiation arteritis.

ACR Appropriateness Criteria Nonatherosclerotic Peripheral Arterial Disease ⁽⁶⁾

Study Design: This document outlines the ACR Appropriateness Criteria for nonatherosclerotic peripheral arterial disease. It is a guideline developed by the American College of Radiology (ACR) and published in the Journal of the American College of Radiology in 2019.

Target Population: The guidelines are intended for patients with nonatherosclerotic diseases affecting the peripheral arteries. This includes conditions such as popliteal entrapment syndrome, external iliac artery endofibrosis, inflammatory vasculitides, and vascular trauma.

Key Factors:

- **Diagnostic Imaging:** The guidelines recommend various imaging modalities for initial evaluation, including MRA, CTA, and US duplex Doppler.
- **Clinical Presentation:** The document discusses the clinical presentation of different nonatherosclerotic peripheral arterial diseases and provides recommendations for appropriate imaging studies based on the suspected condition.
- **Treatment Recommendations:** The guidelines offer evidence-based recommendations for imaging and treatment procedures, emphasizing the importance of accurate vascular imaging and nonvascular findings in guiding surgical management.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽²⁾

Study Design: This document presents the 2024 ESC Guidelines for the management of peripheral arterial and aortic diseases. It is developed by the task force of the European Society of Cardiology (ESC) and endorsed by several European associations.

Target Population: The guidelines target patients with peripheral arterial and aortic diseases, including atherosclerotic and nonatherosclerotic conditions. It covers a wide range of topics, from epidemiology and risk factors to diagnostic work-up and treatment strategies.

Key Factors:

- **Epidemiology and Risk Factors:** The guidelines provide detailed information on the prevalence and risk factors associated with peripheral arterial and aortic diseases.
- **Diagnostic Work-Up:** The document outlines the recommended diagnostic tests and imaging modalities for evaluating peripheral arteries and the aorta.
- **Treatment Strategies:** The guidelines offer comprehensive recommendations for medical and interventional treatment of various peripheral arterial and aortic conditions, including chronic limb-threatening ischemia, carotid artery stenosis, and aortic aneurysms.

- **Follow-Up:** The guidelines emphasize the importance of regular follow-up and monitoring for patients with peripheral arterial and aortic diseases.

ANALYSIS OF EVIDENCE

Shared Findings ^(2,6,11):

- **Accuracy and Utility of Angiography:** All three articles emphasize the accuracy and utility of angiography in diagnosing vascular pathologies. Bozlar et al 2013 highlights the use of CT angiography (CTA) for evaluating non-traumatic vascular abnormalities in the upper extremities. Francois et al 2019 discusses the appropriateness of various imaging modalities, including CTA and MRA, for diagnosing nonatherosclerotic peripheral arterial diseases. Mazzolai et al 2024 also underscores the importance of CTA and MRA in evaluating peripheral arterial and aortic diseases.
- **Non-invasive Nature:** The non-invasive nature of CTA and MRA is a common theme. Bozlar et al 2013 mentions the evolution of CTA into a highly accurate non-invasive diagnostic tool. Francois et al 2019 highlights the non-invasive nature of MRA and CTA in their appropriateness criteria. Mazzolai et al 2024 also discusses the non-invasive benefits of these imaging techniques.
- **Clinical Applications:** All three articles discuss the clinical applications of extremity angiography imaging. Bozlar et al 2013 focuses on the use of CTA in non-traumatic vascular pathologies. Francois et al 2019 provides guidelines for the initial evaluation of various nonatherosclerotic peripheral arterial diseases. Mazzolai et al 2024 offers comprehensive guidelines for managing peripheral arterial and aortic diseases, including the use of imaging.

Conclusion ^(2,6,11):

In summary, while all three articles highlight the importance and accuracy of extremity angiography imaging, they differ in their focus on specific conditions, imaging modalities, and recommendations. Bozlar et al 2013 provides a detailed analysis of CTA's clinical applications in the upper extremities, Francois et al 2019 offers appropriateness criteria for various imaging modalities, and Mazzolai et al 2024 presents comprehensive guidelines for managing peripheral arterial and aortic diseases.

POLICY HISTORY

Date	Summary
July 2025	Added a subtitle: Arm, Upper Extremity
June 2025	- Guideline number changed from 058-2 to 2064 - Guideline name changed from Upper Extremity MRA/MRA to Upper Extremity Magnetic Resonance Angiography (MRA) - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Added non-atherosclerotic PVD to Peripheral Vascular Disease and Genetics Syndromes and Rare Diseases sections - Broke down clinical suspicion of vascular disease section for clarity - Standardized preoperative and postoperative assessment and Genetic Syndrome and Rare Diseases sections - Edited text for clarity and consistency - Adjusted applicable lines of business – Medicare Advantage checked - Updated references - Added a Summary of Evidence and Analysis of Evidence
June 2024	- Content clarified without change to clinical indications - Added Genetics Syndrome and Rare Diseases section - Added Contraindications and Preferred Studies section in background - Updated References

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evotent Clinical Guideline 2033 for Lower Extremity Computed Tomography Angiography (CTA)

Guideline Number: Evotent_CG_2033	<u>Applicable Codes</u>	
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Original Date: July 2008	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the arteries and veins that can be evaluated for evidence of stenosis, occlusion, or aneurysms. It is used to evaluate the blood vessels of the lower extremities. CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function. Lower Extremity CTA is not used as a screening tool, e.g., evaluation of asymptomatic patients without a previous diagnosis.

NOTE: Authorization for CT Angiography (CTA) covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography

Special Notes

- When a separate CTA and CT exam is requested, documentation requires a medical reason that clearly indicates why additional CT imaging of the lower extremity is needed.
- When vascular imaging of the aorta **AND** both legs (CTA aortogram and runoff) is desired (sometimes incorrectly requested as Abd/Pelvis CTA & Lower Extremity CTA Runoff), only one authorization request is required, using CPT Code 75635 CTA Aortogram with bilateral lower extremity runoff. This study provides for imaging of the abdomen, pelvis, and both legs. A separate authorization for Lower Extremity CTA (CPT Code 73706) is **NOT** needed.
- If **ONLY** Extremity CTA is requested and Abdominal vascular imaging is **NOT** needed, Lower Extremity CTA (CPT Code 73706) can be considered.

INDICATIONS FOR LOWER EXTREMITY COMPUTED TOMOGRAPHY ANGIOGRAPHY (CTA)

Lower Extremity Peripheral Vascular Disease

For evaluation of known or suspected lower extremity vascular disease ⁽¹⁾:

- For known or suspected atherosclerotic peripheral arterial disease when any **ONE** of the following non-invasive studies are abnormal or indeterminate ⁽²⁻⁴⁾:
 - Ankle-brachial index (ABI) (< 0.9 is the cutoff for diagnosis of peripheral arterial disease and >1.4 is considered inconclusive)
 - Toe brachial index (< 0.7 is the cutoff for diagnosis of peripheral arterial disease)
 - Segmental pressure test (a pressure gradient $\geq$ 20 mmHg is considered abnormal)
 - Doppler ultrasound
 - Treadmill test
 - 6-minute walking test
- For acute critical limb ischemia with any **ONE** of the below clinical signs of peripheral vascular disease ^(5,6):
 - Ischemic rest pain
 - Tissue loss
 - Gangrene
 - **NOTE:** Prior ultrasound is **NOT** needed
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁷⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the lower extremity
 - Signs or symptoms of lower extremity vascular disease (such as claudication, weak pulses)
- For leg/foot ulcers on exam from known/suspected peripheral vascular disease **after** prior abnormal or indeterminate ultrasound ^(1,2)
- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following ^(8,9):
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate prior non-invasive testing or imaging (such as ankle/brachial index, ultrasound)

Popliteal Artery Entrapment Syndrome

- For known / suspected popliteal artery entrapment syndrome with **ALL** the following ⁽¹⁰⁾:
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management

Deep Venous Thrombosis (DVT)

- For known / suspected DVT with **ALL** the following ^(11,12):
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management

Arterial Thromboembolism

- Clinical findings (such as pulselessness, acute limb ischemia) and / or prior imaging suggestive of lower extremity arterial thromboembolism ⁽⁹⁾

NOTE: Echocardiogram and advanced vascular imaging of the chest, abdomen, and / or pelvis may also be indicated to identify the source of the emboli.

Clinical Suspicion of Aneurysm

- With prior abnormal or indeterminate ultrasound or other imaging ⁽¹³⁾

Clinical Suspicion of Vasculitis

- With prior abnormal or indeterminate ultrasound or other imaging ⁽¹³⁾

Hemodialysis Graft Dysfunction

- If-prior ultrasound was completed and not sufficient for required treatment decisions ⁽¹⁴⁾

Vascular Malformation (VM) ^(15,16)

- For known / suspected lower extremity VM with **ALL** the following:
 - Prior abnormal or indeterminate ultrasound
 - MR angiography is contraindicated or cannot be performed
 - Advanced imaging study results will potentially change management
- A concurrent CT is also approvable for initial evaluation and / or preoperative planning with any **ONE** of the following:
 - MRI is **contraindicated** or cannot be performed
 - Surgeon preference.

Traumatic Injuries

- Clinical findings (such as bruit, hemorrhage, hematoma, pulselessness) and / or prior imaging suggestive of lower extremity vascular injury ⁽¹⁷⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor after prior imaging (may be approved in combination with CT or MRI of tumor)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification.
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos Syndrome (vEDS): With inconclusive ultrasound or ultrasound suggestive of vascular pathology **OR** acute extremity pain and concern for dissection/rupture ^(18,19)
- Williams Syndrome: Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽²⁰⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline,

coverage is based on a case-by-case basis using societal guidance

- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁷⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the lower extremity
 - Signs or symptoms of lower extremity vascular disease (such as claudication, weak pulses)

CODING AND STANDARDS

Codes

73706

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria Nonatherosclerotic Peripheral Arterial Disease ⁽⁷⁾

Study Design: This study provides evidence-based guidelines for the diagnosis and treatment of nonatherosclerotic peripheral arterial diseases. The guidelines were developed by the American College of Radiology (ACR) and reviewed annually by a multidisciplinary expert panel.

Target Population: The guidelines are intended for radiologists, radiation oncologists, and referring physicians dealing with patients suspected of having nonatherosclerotic peripheral arterial diseases.

Key Factors: The study discusses various nonatherosclerotic diseases affecting peripheral arteries, including popliteal entrapment syndrome, external iliac artery endofibrosis, lower-extremity inflammatory vasculitides, and vascular trauma. It emphasizes the importance of accurate vascular imaging and provides recommendations for appropriate initial diagnostic imaging studies based on clinical presentation and suspicion of disease.

2024 ACC/AHA/AACVPR/APMA/ABC/SCAI/SVM/SVN/SVS/SIR/VESS Guideline for the Management of Lower Extremity Peripheral Artery Disease ⁽⁹⁾

Study Design: This guideline provides recommendations for the management of lower extremity peripheral artery disease (PAD) and was developed by the American College of Cardiology (ACC) and the American Heart Association (AHA).

Target Population: The guidelines are aimed at clinicians treating patients with lower extremity PAD across various clinical presentation subsets, including asymptomatic, chronic symptomatic, chronic limb-threatening ischemia, and acute limb ischemia.

Key Factors: The study includes a comprehensive literature review, covering studies, reviews, and other evidence conducted on human subjects. It provides updated recommendations for the diagnosis, medical therapy, exercise therapy, and revascularization for PAD. The guidelines also address special considerations such as risk amplifiers, health disparities, and management of PAD in older patients.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽¹⁾

Study Design: This guideline was developed by the European Society of Cardiology (ESC) and provides recommendations for the management of peripheral arterial and aortic diseases.

Target Population: The guidelines are intended for healthcare professionals managing patients with peripheral arterial and aortic diseases, including those with atherosclerotic and non-atherosclerotic conditions.

Key Factors: The study covers a wide range of topics, including epidemiology, risk factors, clinical assessment, diagnostic tests, medical therapy, and interventional treatment. It emphasizes a comprehensive approach to managing the entirety of the arterial circulation and highlights the importance of a multidisciplinary approach in expert and high-volume centers.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,7,9):

- Importance of Imaging Modalities: All three articles emphasize the significance of imaging modalities in diagnosing and managing peripheral arterial diseases. They highlight the use of techniques such as Duplex Ultrasound (DUS), Computed Tomography Angiography (CTA), and Magnetic Resonance Angiography (MRA) for accurate visualization of vascular abnormalities and guiding treatment decisions.
- Role of Non-invasive Imaging: The articles agree on the value of non-invasive imaging techniques like DUS and MRA for initial assessment and follow-up of patients with peripheral arterial diseases. These methods are preferred due to their ability to provide detailed information without the risks associated with invasive procedures.
- Use of CTA: CTA is recognized across the articles for its high spatial resolution and ability to visualize calcifications, making it a valuable tool for assessing the severity of arterial stenosis and planning revascularization.

Conclusion ^(1,7,9):

The evidence across these articles reiterates the critical role of imaging in diagnosing and managing peripheral arterial diseases. Non-invasive imaging techniques like DUS and MRA are preferred for initial assessment and follow-up due to their safety and detailed visualization capabilities. CTA is valuable for its high spatial resolution and ability to visualize calcifications, making it essential for planning revascularization.

While the articles share common conclusions on the importance of imaging modalities, they differ in their specific recommendations, target populations, and key factors. Francois et al 2019 provides detailed appropriateness criteria for various imaging modalities based on specific clinical scenarios, while Gornik et al 2024 focuses on comprehensive management of lower extremity PAD and Mazzolai et al 2024 offers a holistic approach to peripheral arterial and aortic diseases, including genetic conditions.

Overall, the shared and differing conclusions highlight the multifaceted nature of extremity imaging and the need for tailored approaches based on the patient's specific condition and clinical scenario.

POLICY HISTORY

Date	Summary
June 2025	● Guideline number changed from 061-1 to 2033 ● Guideline name changed from Lower Extremity CTA/CTV to Lower Extremity Computed Tomography Angiography (CTA) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices

Date	Summary
	• Added non-invasive studies and non-atherosclerotic PVD to Peripheral Vascular Disease section • Broke down clinical suspicion of vascular disease section for clarity • Added non-atherosclerotic PVD to Genetics Syndromes and Rare Diseases section • Standardized preoperative and postoperative assessment and Imaging in Known Genetic Conditions sections • Reduced Background section • Edited text for clarity and consistency • Updated reference • Added a Summary of Evidence and Analysis of Evidence
April 2024	• Updated references • Added Genetics Syndromes and Rare Diseases, Evaluation of Tumor, and Contraindications and Preferred Studies sections

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2035 for Lower Extremity Magnetic Resonance Imaging (MRI)

Ankle, Foot, Hip, Knee, Lower Extremity

Guideline Number: Evolent_CG_2035	<u>Applicable Codes</u>	
<i>"Evolent" refers to Evolent Health LLC and Evolent Specialty Services, Inc.</i> <i>© 1997 - 2026 Evolent. All rights Reserved.</i>		
Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance imaging (MRI) shows the soft tissues and bones. With its multiplanar capabilities, high contrast, and high spatial resolution, it is an accurate diagnostic tool for conditions affecting the joint and adjacent structures.

MRI can positively influence clinicians' diagnoses and management plans for patients with conditions such as primary bone cancer, fractures, abnormalities in ligaments/tendons/cartilage, septic arthritis, and infection/inflammation.

Special Notes

- Plain X-rays must precede MRI evaluation unless otherwise indicated
- Some indications are for MRI, Computed Tomography (CT), or MR or CT Arthrogram (more than one should **NOT** be approved at the same time)
- If an MR Arthrogram fits approvable criteria below, approve as MRI

INDICATIONS FOR LOWER EXTREMITY MRI (ANKLE, FOOT, HIP, KNEE, OR LEG)

Lower Extremity Pain

NOTE: Prior completed X-ray showing no clear etiology of joint/extremity pain must precede lower extremity MRI evaluation unless otherwise indicated

Non-specific Lower Extremity Pain ^(1,2)

Lower extremity pain with no specific joint identified with prior X-ray showing no clear etiology of extremity pain with any **ONE** of the following:

- Persistent musculotendinous lower extremity pain unresponsive to **ACTIVE Conservative Therapy (ACT)** which includes physical therapy, chiropractic treatments, and/or physician supervised **Home Exercise Program (HEP)** of at least four (4) weeks duration within the last 6 months
- With progression or worsening of symptoms during the course of active conservative treatment
- Pediatric patient that is either under the age of 12 years **OR** cannot comply with the prescribed therapy

Joint Specific Pain or Suspected Joint Specific Injury

In the absence of a positive joint specific orthopedic sign on exam (see list below), advanced imaging is indicated with prior X-ray showing no clear etiology for the joint pain with any **ONE** of the following:

- Persistent joint pain unresponsive to **ACTIVE Conservative Therapy (ACT)** which includes physical therapy, chiropractic treatments, and/or physician supervised **Home Exercise Program (HEP)** of at least four (4) weeks duration within the last 6 months
- With progression or worsening of symptoms during the course of active conservative treatment
- Pediatric patient that is either under the age of 12 years **OR** cannot comply with the prescribed therapy

NOTE: For Bilateral Hip MRI requests: When the patient meets hip joint MRI criteria for both right and left hip pain (X-ray completed **AND** persistent pain unresponsive to active conservative therapy) without a positive orthopedic sign, then Pelvis MRI (Evolent_CG_2045) is the preferred study.

Joint Specific Orthopedic Signs

NOTE: With a positive orthopedic sign from the list below, an initial X-ray is always preferred; however, it is **NOT** required **UNLESS** otherwise specified in **bold** below.

NOTE: The joint specific exam testing list below is intended to be thorough but cannot possibly be all inclusive. Advanced imaging is indicated for any orthopedic exam test that clearly suggests joint instability

Joint specific advanced imaging is indicated for any positive orthopedic sign listed below:

Ankle ^(3–7)

- Physical exam demonstrating a positive result for any **ONE** of the following tests:

Suspected Injury	Test Name	Description
High Ankle	Anterior drawer test	Anterior translation of 1 cm or more of the foot while stabilizing the tibia compared to the healthy contralateral ankle
	Cotton Test	Translation of 3-5 mm and/or a palpable click with lateral translation of the tibia while stabilizing the foot
	Dorsiflexion external rotation stress test	Pain with external rotation stress with the foot in maximal dorsiflexion
	Posterior drawer test	Excessive posterior translation of the foot while stabilizing the tibia compared to the healthy contralateral ankle
	Squeeze Test	Pain with compression of the proximal fibula against the tibia
Achilles Tendon	Palpable partial/complete tendon defect	Direct palpation of an Achilles tendon injury
	Thompson Test	Absence of plantar flexion of the foot with squeezing of the calf

- Positive ankle stress X-rays (a specialized X-ray study that assesses the integrity of the ankle's ligaments and joints)

Knee ^(8–10)

- Physical exam demonstrating a positive result for any **ONE** of the following tests:

Suspected Injury	Test Name	Description
Anterior cruciate ligament (ACL) ⁽¹¹⁾	Anterior drawer test	Increased anterior translation of the tibia with the foot stabilized and the knee flexed to 90 degrees
	Lachman's Test	Increased anterior translation of the tibia with the thigh stabilized and the knee flexed to 20-30 degrees

Suspected Injury	Test Name	Description
	Pivot shift test	Anterior tibial subluxation with internal rotation and valgus stress to the knee
Meniscus ⁽¹²⁾	Apley's test	Pain/grinding during axial compression and rotation of the knee
	McMurray's Compression Test	Pain/clicking in the knee with internal and external rotation with extension
	Thessaly Test	Pain/clicking in the knee with internal and/or external rotation while standing only on that leg
Posterior cruciate ligament (PCL)	Posterior Drawer Test	Increased posterior translation of the tibia with the foot stabilized and the knee flexed to 90 degrees
	Posterior tibial sag sign (Godfrey test or step-off test)	The tibia sags posteriorly relative to the femur when the knee is flexed compared to the other/contralateral knee
Medial collateral ligament (MCL)	Positive valgus stress testing/laxity	Pain or laxity in the knee with medially directed (valgus) pressure
Lateral collateral ligament (LCL)	Positive varus stress testing/laxity	Pain or laxity in the knee with laterally directed (varus) pressure
Patella dislocation	Patellofemoral apprehension test	Pain with lateral pressure on the patella with contraction of the quadriceps and the knee flexed to 30 degrees

- Suspected ACL Rupture - acute knee injury with physical exam limited by pain and swelling **AFTER** initial X-ray completed that does not show a clear etiology with any **ONE** of the following ⁽¹³⁾:
 - Extreme mechanism of injury (such as twisting, blunt force)
 - Extreme pain with inability to perform physical examination
 - Instability to stand (bear full weight)

- Audible pop at time of injury
- Very swollen joint with inability to perform the physical exam
- Large knee effusion on recent prior X-ray
- Acute mechanical locking of the knee with inability to move the knee (not due to pain or guarding) ⁽¹⁴⁾
- Suspected patellar dislocation (acute or recurrent) with X-ray findings compatible with a patellar dislocation (such as lipohemarthrosis (a condition where fat/blood build up in joint often after trauma) or osteochondral fracture) ⁽¹⁵⁾

Hip ⁽¹⁶⁾

- Physical exam demonstrating a positive result for any **ONE** of the following tests:

Suspected Injury	Test Name	Description
Femoroacetabular impingement (FAI) and/or labral tear	Anterior impingement sign / Flexion, Adduction, and Internal Rotation (FADIR) test	Hip or groin pain with hip flexion, adduction, and internal rotation
	Posterior impingement sign	Pain with hip extension and external rotation
Suspected Slipped Capital Femoral Epiphysis (SCFE)	Drehmann sign	The hip remains externally rotated when flexed to 90 degrees and there is pain or inability to internally rotate the hip

- Suspected Femoroacetabular impingement (FAI) (abnormal bone structure in hip joint causing chronic pain) **OR** suspected labral tear (specific injury to the cartilage rim (labrum) of the hip socket, labral tear can result from chronic FAI) with any **ONE** of the following ^(17,18):
 - Symptoms of hip clicking, locking, catching, giving way or instability with a clinical suspicion of FAI / labral tear
 - X-ray findings suggestive of FAI / labral tear (such as cross over sign, pistol grip deformity, alpha angle over 50 degrees)
 - Determine candidacy for hip preservation surgery for known FAI
- For Bilateral Hip MRI requests:
 - When the patient meets the criteria above for a suspected labral tear (with a positive orthopedic sign) then bilateral hip MRIs are the preferred studies (**NOT** Pelvis MRI)
 - When Bilateral hip arthrograms are requested and otherwise meet guidelines, bilateral hip MRIs are the preferred studies (**NOT** Pelvis MRI)

NOTE: When the patient meets hip MRI guidelines for both the right and left hip pain (X-ray completed **AND** persistent pain unresponsive to active conservative treatment) without a positive orthopedic sign, then Pelvis MRI (Evolent_CG_2045) is the preferred study.

Suspected Lower Extremity Tendon Rupture ^(5,19)

High clinical suspicion of a specific tendon rupture with **ALL** of the following:

- After X-ray completed
- Mechanism of injury (such as excess muscle/tendon load, direct blow, high speed impact event) and/or physical findings (such as palpable defect in quadriceps, patellar tendon rupture on exam) consistent with possible tendon rupture

Lower Extremity Trauma

Suspected Bone Fracture

- Hip and Femur ⁽²⁰⁾
 - Suspected occult, stress or insufficiency fracture with a negative or indeterminate initial X-ray
 - An immediate MRI is indicated (no follow up X-rays required)
 - Suspicion of a hip fracture in a pregnant patient does **NOT** require an initial X-ray
- Non-hip lower extremity:
 - Suspected occult, stress, or insufficiency fracture ⁽²¹⁾ with any **ONE** of the following:
 - X-rays, taken 10-14 days or more after the injury or initial clinical assessment, are negative or indeterminate
 - If the anatomic location of the suspected fracture (such as the navicular bone) puts the patient at high risk for developing a complete fracture with active conservative therapy
 - Suspected Lisfranc injury (complex fracture dislocation of the meta-tarsal joint(s) of the foot) **AND** prior indeterminate or normal X-ray ⁽²²⁾
 - **NOTE:** Advanced imaging of the foot (not ankle) is the appropriate study to evaluate a possible Lisfranc injury
- Suspected pathologic fracture on prior X-ray or CT ⁽²¹⁾
- Concern for impending fracture on prior X-ray or CT ⁽²¹⁾
- Suspected nonunion or delayed union as demonstrated by no healing between two sets of X-rays 4 to 8 months or more apart ⁽²³⁾
 - **NOTE:** CT is the preferred study. MRI approvable if there is contraindication to CT

Known Bone Fracture

- Known traumatic fractures on prior imaging with suspected associated ligament or

tendon injury

Osteochondral Lesions (7,9,16,24)

Defects, Fractures, Osteochondritis Dissecans

- Clinical suspicion based with completed prior X-ray that is indeterminate or abnormal and any **ONE** of the following:
 - Suspicious mechanism of injury (such as prior twisting type joint injury, repeated joint microtrauma from running/jumping)
 - Suspicious physical findings (such as focal pain, decreased range of motion, or joint clicking/catching)

Joint Prosthesis / Replacement (25,26)

- Suspected joint prosthesis complication (such as prosthesis loosening, dysfunction, or pseudotumor formation) with prior X-ray that is indeterminate or abnormal
- Suspected metallosis (increased serum levels of metal ions) with painful metal on metal hip replacement (27) after initial X-rays completed and any **ONE** of the following:
 - Significantly elevated Cobalt levels (normal level is less than 1.7 micrograms/liter (ppb)) (28)
 - Significantly elevated Chromium levels (normal level for patients with metallic implants is less than 2.0 micrograms/liter (ppb)) (28)
 - Indeterminate or abnormal joint aspiration (such as findings of metallic debris and absence of infection)

Lower Extremity Vascular Malformation (VM)

- Vascular malformations of the lower extremity with any **ONE** of the following (29):
 - After initial evaluation with ultrasound and advanced imaging results will change management
 - Indeterminate or abnormal prior ultrasound
 - Preoperative planning
 - Follow up after prior surgical treatment and/or embolization

NOTE: MRA of the lower extremity is also indicated with any of the above conditions

Osteonecrosis (30)

- To further characterize a prior abnormal X-ray or CT suggesting osteonecrosis
- Symptomatic and high-risk patients (such as glucocorticosteroid use, renal transplant, glycogen storage disease, alcohol abuse, sickle cell anemia) with normal or indeterminate prior X-ray

- Known osteonecrosis (such as avascular necrosis, Legg-Calve-Perthes Disease) to evaluate the contralateral joint after initial X-rays are abnormal or indeterminate

Loose Bodies or Synovial Chondromatosis ⁽³¹⁾

- To evaluate joint pain or mechanical symptoms suspected to be the results of loose bodies and/or chondromatosis (rare, benign condition where multiple cartilaginous nodules form within the synovial lining of a joint) after prior indeterminate or abnormal imaging (X-ray and /or ultrasound)

Infection / Inflammation

Infection of Bone, Joint, or Soft Tissue Abscess ⁽³²⁾

- Clinical suspicion of infection of the lower extremity with abnormal or indeterminate prior X-ray or ultrasound
- Negative prior X-ray or ultrasound but with a clinical suspicion of advanced infection based on any **ONE** of the following:
 - Signs and symptoms of joint or bone infection such as:
 - Pain and swelling
 - Decreased range of motion
 - Fevers
 - Laboratory findings consistent with possible bone or joint infection such as:
 - Elevated ESR or CRP
 - Elevated white blood cell count
 - Positive joint aspiration
- Lower extremity ulcer (such as diabetic, pressure, ischemic, or traumatic ulcer) with suspected advanced infection with **ALL** of the following ^(33,34):
 - Signs of advanced infection on exam (such as redness, warmth, swelling, exposed bone, bone is encountered when probing the wound, worsening breakdown, worsening smell)
 - No improvement despite prior treatment and bone or deep soft tissue infection is now suspected
- Neuropathic foot with signs of advanced infection (such as friable or discolored granulation tissue, foul odor, purulent or non-purulent discharge, and delayed wound healing) ⁽³⁴⁾

Inflammatory (Autoimmune) Joint Disease ^(35,36)

- For suspected inflammatory joint disease (such as rheumatoid arthritis, psoriatic arthritis) with any **ONE** of the following:
 - Prior indeterminate or abnormal imaging

- Prior normal imaging but with lab test results (such as RF, CRP, ANA, ESR) that suggest autoimmune disease
- For known inflammatory joint disease (such as rheumatoid arthritis, psoriatic arthritis) with any **ONE** of the following:
 - Recent indeterminate imaging
 - To assess the response to ongoing active medical therapy where prior imaging and/or labs are currently insufficient or have been insufficient in the past
 - To help determine the need to change ongoing active medical therapy based on new/worsening signs or symptoms (such as joint swelling, tenderness, effusion, erythema, warmth, restricted motion, prolonged morning stiffness)

Inflammatory Myopathies (37,38)

- For suspected inflammatory myopathy (such as polymyositis, dermatomyositis, immune-mediated necrotizing myopathy, inclusion body myositis) with any **ONE** of the following:
 - Clinical suspicion based on presenting symptoms (such as symmetric extremity weakness)
 - Clinical suspicion based on lab testing (such as muscle enzyme testing)
 - Clinical suspicion based on prior electromyogram (EMG) results
 - For biopsy planning
- For known inflammatory myopathy (such as polymyositis, dermatomyositis, immune-mediated necrotizing myopathy, inclusion body myositis) with any **ONE** of the following:
 - Prior indeterminate imaging
 - To assess the response to ongoing active medical therapy where prior imaging and/or labs are or have been insufficient
 - To help determine the need to continue or change ongoing active medical therapy where prior imaging and/or labs are or have been insufficient

Peripheral Nerve Entrapment (39,40)

- For suspected peripheral nerve entrapment (such as Morton's neuroma, tarsal tunnel) with any **ONE** of the following:
 - Abnormal electromyogram or nerve conduction study
 - Abnormal X-ray or ultrasound
 - Failed prior 4-week inactive conservative therapy including at least two of the following (active conservative therapy is **NOT** required):
 - Activity modification
 - Rest, ice, and/or heat
 - Splinting or orthotics

- Pharmacotherapy (such as NSAIDs, steroids)

Foreign Body ⁽⁴¹⁾

- For known or suspected foreign body of the lower extremity with prior imaging that is indeterminate or abnormal

Painful Acquired or Congenital Flatfoot Deformity ^(42,43)

- Evaluation of painful acquired flatfoot deformity (pes planus) or suspicion of congenital flatfoot deformity (such as tarsal coalition (abnormal fusion of two or more bones in the midfoot or hindfoot)) with **ALL** of the following:
 - After prior X-ray completed with no clear etiology for pain
 - Failed prior 4-week trial of **inactive** conservative therapy including at least two of the following (active conservative therapy is **NOT** required):
 - Activity modification
 - Rest, ice, and/or heat
 - Splinting or orthotics
 - Pharmacotherapy (such as NSAIDs, steroids)
 - **NOTE:** Prior X-ray is **NOT** required for pediatric patients

Pediatric Specific Indications (Up to Age 18)

- Osteoid Osteoma – after prior X-ray is indeterminate or abnormal **AND** when lower extremity CT (the preferred study) is insufficient or not available ⁽⁴⁴⁾
- Suspected Slipped Capital Femoral Epiphysis (SCFE) with indeterminate or negative frog leg lateral and AP X-rays of the hips with any **ONE** of the following ⁽⁴⁵⁾:
 - Drehmann sign (The hip remains externally rotated when flexed to 90 degrees and there is pain or inability to internally rotate the hip)
 - Limited internal rotation of the hip
- Suspected Chronic Recurrent Multifocal Osteomyelitis after completion of initial X-ray imaging and laboratory evaluation (such as CRP, ESR) ^(46,47)
 - **NOTE:** Whole body bone marrow MRI (See Evolent_CG_2007 for Bone Marrow MRI) is preferred when imaging of multiple joints is requested
- Acute limp in a child 5 or less years old ⁽⁴⁸⁾

Suspected Malignancy

- Suspected malignancy with prior imaging that is abnormal or indeterminate

Known Malignancy (49,50)

Initial Staging

- For initial staging of a primary extremity tumor

Restaging

- Monitoring of a primary extremity tumor on treatment
- End of treatment evaluation of a primary extremity tumor
- Prior to surgery of a primary extremity tumor

Surveillance

- Follow-up of known primary cancer of extremity
 - Every 3-6 months for 2-3 years, then every 6-12 months until 5 years then annually
- Signs or symptoms or imaging findings suspicious for recurrence
- Suspected metastatic disease with signs/symptoms and after initial imaging with X-ray or ultrasound

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Trendelenburg sign ⁽⁵¹⁾ (contralateral pelvic drop during a single-leg stance) or other indication of muscle or nerve damage after recent hip surgery
- Known or suspected complication
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification

- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam).

IMAGING IN KNOWN GENETIC CONDITIONS

- Gaucher Disease ⁽⁵²⁾:
 - Prior to treatment or dose change **OR**
 - For evaluation of bone pain

CODING AND STANDARDS

Codes

72195, 72196, 72197, 73718, 73719, 73720, 73721, 73722, 73723, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Conservative Therapy

Conservative therapy should include a multimodality approach consisting of a combination of active and inactive components. Completion of at least one active modality for 4 weeks in the past 6 months is required:

Active Modalities:

- Physical therapy
- Physician-supervised **Home Exercise Program (HEP)**
- Chiropractic care

Inactive Modalities:

- Medications (e.g., NSAIDs, steroids, analgesics)
- Injections
- Medical Devices (e.g., TENS unit, bracing)

Home Exercise Program (HEP)

The following two elements are required for HEP to meet the criteria for completion of a trial of active conservative therapy (ACT):

- Information is provided on specific exercise prescription/plan **AND**
- Follow-up with patient regarding completion of HEP over at least a 4-week period OR documented inability to complete HEP due to increased pain with inability to physically perform the prescribed exercises.

NOTE: Patient inconvenience or noncompliance without explanation does not meet the “inability to complete HEP” criterium

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

EULAR recommendations for the use of imaging of the joints in the clinical management of rheumatoid arthritis ⁽³⁵⁾

Study Design: This study involved a systematic review and consensus process by an expert group of rheumatologists, radiologists, methodologists, and experienced rheumatology practitioners from 13 countries. They generated 13 key questions on the role of imaging in rheumatoid arthritis (RA) and systematically searched research evidence to develop 10 recommendations

Target Population: Adults (≥ 18 years of age) with a clinical diagnosis of RA

Key Factors:

- Imaging modalities included conventional radiography, ultrasound, MRI, CT, dual-emission x-ray absorptiometry, digital x-ray radiogrammetry, scintigraphy, and positron emission tomography.
- The study identified 6888 references, from which 199 studies were included in the

systematic review.

- Recommendations covered the role of imaging in diagnosing RA, detecting inflammation and damage, predicting outcome and response to treatment, monitoring disease activity, progression, and remission.

ACR Appropriateness Criteria Stress (Fatigue-Insufficiency) Fracture Including Sacrum Excluding Other Vertebrae: 2024 Update ⁽²¹⁾

Study Design: This study is an update of the American College of Radiology Appropriateness Criteria for stress fractures, including both fatigue and insufficiency types. It involved a systematic analysis of the medical literature from peer-reviewed journals and expert panel reviews

Target Population: Patients with suspected stress fractures, including athletes, older patients, and patients with predisposing conditions

Key Factors:

- Radiography is the imaging modality of choice for baseline diagnosis.
- MRI is preferred for diagnosing radiographically occult stress fractures.
- Nuclear medicine scintigraphy and CT may also be useful diagnostic tools.
- The study emphasizes the importance of prompt therapeutic measures to prevent progression to complete fractures.

Treatment of Acute Achilles Tendon Rupture ⁽⁵⁾

Study Design: This review article provides a comprehensive review of the literature on acute rupture of the Achilles tendon and discusses appropriate treatment options

Target Population: Patients with acute Achilles tendon rupture, including athletes and elderly individuals

Key Factors:

- The Achilles tendon is the strongest and largest tendon in the body but is also the most commonly ruptured.
- The study discusses the controversy surrounding the optimal treatment of acute Achilles tendon rupture, comparing conservative management with operative treatment.
- Recent studies have demonstrated favorable outcomes of conservative treatment using accelerated functional rehabilitation.
- The article emphasizes the importance of early rehabilitation for both conservative and operative treatments

ANALYSIS OF EVIDENCE

Shared Findings ^(5,21,35):

- All three studies highlight the importance of imaging in diagnosing and managing musculoskeletal conditions. Colebatch et al 2013 and Morrison et al 2024 emphasize the role of imaging in diagnosing RA and stress fractures, respectively, while Park et al 2020 discusses the use of imaging in diagnosing Achilles tendon ruptures.
- Early intervention and rehabilitation are crucial for improving patient outcomes. Colebatch et al 2013 and Park et al 2020 both stress the importance of early rehabilitation in managing RA and Achilles tendon ruptures.

Conclusion ^(5,21,35)

In summary, while all three studies emphasize the importance of imaging and early intervention, they differ in their focus on specific conditions and treatment options. Colebatch et al 2013 provides recommendations for imaging in RA, Morrison et al 2024 updates criteria for diagnosing stress fractures, and Park et al 2020 reviews treatment options for Achilles tendon ruptures

POLICY HISTORY

Date	Summary
July 2025	• Added MRI Hip CPT codes: 72195, 72196, 72197
June 2025	• Guideline number changed from 057-4 to 2035 • Guideline name changed from Lower Extremity MRI to Lower Extremity Magnetic Resonance Imaging (MRI) ◦ Added a subtitle: Ankle, Foot, Hip, Knee, Lower Extremity • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Tables of orthopedic signs added • Metastatic disease and Lisfranc injury indications added • Metallosis, Inflammatory arthritis, pediatric, and flatfoot indications clarified and updated • Updated Malignancy section • Standardized pre/post-operative language • Added imaging in known genetic condition section • Edited text for clarity

Date	Summary
	- Adjusted applicable lines of business – Medicare Advantage checked - Background edited - Added a Summary of Evidence and Analysis of Evidence - References updated and expanded
May 2024	- Contraindications and preferred studies section added to the background - Updated background and references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2034 for Lower Extremity Magnetic Resonance Angiography (MRA)

Ankle, Lower Extremity

Guideline Number: Evolent_CG_2034	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) generates images of the blood vessels that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. It is used to evaluate the blood vessels of the lower extremities.

NOTE: Authorization for MR Angiography (MRA) covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

Special Notes

- When a separate MRA and MRI exam is requested, documentation requires a medical reason that clearly indicates why additional MRI imaging of the lower extremity is needed.
- As there is no CPT code for MRA Aortogram with lower extremity runoff, two separate authorizations are required: Abdomen MRA (CPT 74185) and one Lower Extremity MRA (CPT 73725). This will provide imaging of the abdomen, pelvis and both legs. A separate Pelvis MRA authorization is **NOT** required. Only one Lower Extremity MRA is required (**NOT** two).

INDICATIONS FOR LOWER EXTREMITY MAGNETIC RESONANCE ANGIOGRAPHY (MRA)

Lower Extremity Peripheral Vascular Disease

For evaluation of known or suspected lower extremity vascular disease ⁽¹⁾ when **CTA is contraindicated or cannot be performed:**

- For known or suspected atherosclerotic peripheral arterial disease when any **ONE** of the following non-invasive studies are abnormal or indeterminate ⁽²⁻⁴⁾:
 - Ankle-brachial index (ABI) (< 0.9 is the cutoff for diagnosis of peripheral arterial disease and >1.4 is considered inconclusive)
 - Toe brachial index (< 0.7 is the cutoff for diagnosis of peripheral arterial disease)
 - Segmental pressure test (a pressure gradient $\geq$ 20 mmHg is considered abnormal)
 - Doppler ultrasound
 - Treadmill test
 - 6-minute walking test
- For acute critical limb ischemia with any **ONE** of the below clinical signs of peripheral vascular disease ^(5,6):
 - Ischemic rest pain
 - Tissue loss
 - Gangrene
 - **NOTE:** Prior ultrasound is **NOT** needed
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loays-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁷⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the lower extremity
 - Signs or symptoms of lower extremity vascular disease (such as claudication, weak pulses)
- For leg/foot ulcers on exam from known/suspected peripheral vascular disease **after** prior abnormal or indeterminate ultrasound ^(1,2)
- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following ^(8,9):
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate prior non-invasive testing or imaging (such as ankle/brachial index, ultrasound)

Popliteal Artery Entrapment Syndrome

- For known/suspected popliteal artery entrapment syndrome with **ALL** the following ⁽¹⁰⁾:
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management

Deep Venous Thrombosis (DVT)

- For known/suspected DVT with **ALL** the following ^(11,12):
 - Prior ultrasound is abnormal or inconclusive
 - Advanced imaging study results will potentially change management
 - CTA is contraindicated or not available

Arterial Thromboembolism

- Clinical findings (such as pulselessness, acute limb ischemia) and/or prior imaging suggestive of lower extremity arterial thromboembolism ⁽⁹⁾

NOTE: Echocardiogram and advanced vascular imaging of the chest, abdomen, and/or pelvis may also be indicated to identify the source of the emboli.

Clinical Suspicion of Aneurysm

- With prior abnormal or indeterminate ultrasound or other imaging when CTA is contraindicated or not available ⁽¹³⁾

Clinical Suspicion of Vasculitis

- With prior abnormal or indeterminate ultrasound or other imaging when CTA is contraindicated or not available ⁽¹³⁾

Hemodialysis Graft Dysfunction

- If prior ultrasound was completed and not sufficient for required treatment decisions ⁽¹⁴⁾

Vascular Malformation (VM) ^(15,16)

- For known / suspected lower extremity VM with **ALL** the following:
 - Prior abnormal or indeterminate ultrasound
 - Advanced imaging study results will potentially change management
- A concurrent MRI is also approvable for initial evaluation/preoperative planning or by surgeon preference.

Traumatic Injuries

- Clinical findings (such as bruit, hemorrhage, hematoma, pulselessness) and/or abnormal prior imaging suggestive of lower extremity vascular injury when **CTA is contraindicated or not available** ⁽¹⁷⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor after prior imaging

(may be approved in combination with CT or MRI of tumor)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report (i.e., x-ray, ultrasound or CT) that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos Syndrome (vEDS): With inconclusive ultrasound or ultrasound suggestive of vascular pathology **OR** acute extremity pain and concern for dissection/rupture ^(18,19)
- Williams Syndrome: Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽²⁰⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance
- For known predisposing conditions (such as Buerger disease, cystic adventitial disease, arterial endofibrosis, fibromuscular dysplasia, segmental arterial mediolysis and/or genetic conditions such as Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehler-Danlos Syndrome) and any **ONE** of the following ⁽⁷⁾:
 - Prior imaging suggestive of non-atherosclerotic peripheral vascular disease of the lower extremity

- Signs or symptoms of lower extremity vascular disease (such as claudication, weak pulses)

OTHER COMBINATION STUDIES WITH LOWER EXTREMITY MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest/Abdomen/Pelvis/Lower Extremity MRA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease.
 - **NOTE:** Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli

CODING AND STANDARDS

Codes

73725

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria Nonatherosclerotic Peripheral Arterial Disease ⁽⁷⁾

Study Design: This study provides evidence-based guidelines for the diagnosis and treatment of nonatherosclerotic peripheral arterial diseases. The guidelines were developed by the American College of Radiology (ACR) and reviewed annually by a multidisciplinary expert panel.

Target Population: The guidelines are intended for radiologists, radiation oncologists, and referring physicians dealing with patients suspected of having nonatherosclerotic peripheral arterial diseases.

Key Factors: The study discusses various nonatherosclerotic diseases affecting peripheral arteries, including popliteal entrapment syndrome, external iliac artery endofibrosis, lower-extremity inflammatory vasculitides, and vascular trauma. It emphasizes the importance of accurate vascular imaging and provides recommendations for appropriate initial diagnostic imaging studies based on clinical presentation and suspicion of disease

2024 ACC/AHA/AACVPR/APMA/ABC/SCAI/SVM/SVN/SVS/SIR/VESS Guideline for the Management of Lower Extremity Peripheral Artery Disease ⁽⁹⁾

Study Design: This guideline provides recommendations for the management of lower extremity peripheral artery disease (PAD) and was developed by the American College of Cardiology (ACC) and the American Heart Association (AHA).

Target Population: The guidelines are aimed at clinicians treating patients with lower extremity PAD across various clinical presentation subsets, including asymptomatic, chronic symptomatic, chronic limb-threatening ischemia, and acute limb ischemia.

Key Factors: The study includes a comprehensive literature review, covering studies, reviews, and other evidence conducted on human subjects. It provides updated recommendations for the diagnosis, medical therapy, exercise therapy, and revascularization for PAD. The guidelines also address special considerations such as risk amplifiers, health disparities, and management of PAD in older patients.

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases ⁽¹⁾

Study Design: This guideline was developed by the European Society of Cardiology (ESC) and provides recommendations for the management of peripheral arterial and aortic diseases.

Target Population: The guidelines are intended for healthcare professionals managing patients with peripheral arterial and aortic diseases, including those with atherosclerotic and non-atherosclerotic conditions.

Key Factors: The study covers a wide range of topics, including epidemiology, risk factors, clinical assessment, diagnostic tests, medical therapy, and interventional treatment. It emphasizes a comprehensive approach to managing the entirety of the arterial circulation and highlights the importance of a multidisciplinary approach in expert and high-volume centers.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,7,9):

- **Importance of Imaging Modalities:** All three articles emphasize the significance of imaging modalities in diagnosing and managing peripheral arterial diseases. They highlight the use of techniques such as Duplex Ultrasound (DUS), Computed Tomography Angiography (CTA), and Magnetic Resonance Angiography (MRA) for accurate visualization of vascular abnormalities and guiding treatment decisions.
- **Role of Non-invasive Imaging:** The articles agree on the value of non-invasive imaging techniques like DUS and MRA for initial assessment and follow-up of patients with peripheral arterial diseases. These methods are preferred due to their ability to provide detailed information without the risks associated with invasive procedures.
- **Use of CTA:** CTA is recognized across the articles for its high spatial resolution and ability to visualize calcifications, making it a valuable tool for assessing the severity of arterial stenosis and planning revascularization.

Conclusion ^(1,7,9):

The evidence across these articles reiterates the critical role of imaging in diagnosing and managing peripheral arterial diseases. Non-invasive imaging techniques like DUS and MRA are preferred for initial assessment and follow-up due to their safety and detailed visualization capabilities. CTA is valuable for its high spatial resolution and ability to visualize calcifications, making it essential for planning revascularization.

While the articles share common conclusions on the importance of imaging modalities, they differ in their specific recommendations, target populations, and key factors. Francois et al 2019 provides detailed appropriateness criteria for various imaging modalities based on specific clinical scenarios, while Gornik et al 2024 focuses on comprehensive management of lower extremity PAD and Mazzolai et al 2024 offers a holistic approach to peripheral arterial and aortic diseases, including genetic conditions.

Overall, the shared and differing conclusions highlight the multifaceted nature of extremity imaging and the need for tailored approaches based on the patient's specific condition and clinical scenario.

POLICY HISTORY

Date	Summary
June 2025	● Guideline number changed from 058-1 to 2034

Date	Summary
	● Guideline name changed from Lower Extremity MRA/MRV to Lower Extremity Magnetic Resonance Angiography (MRA) ○ Added a subtitle: Ankle, Lower Extremity ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Added non-invasive studies and non-atherosclerotic PVD to Peripheral Vascular Disease section ● Broke down clinical suspicion of vascular disease section for clarity ● Added non-atherosclerotic PVD to Genetics Syndromes and Rare Diseases section ● Standardized preoperative and postoperative assessment and Imaging in Known Genetic Conditions sections ● Adjusted applicable lines of business – Medicare Advantage checked ● Reduced Background section ● Edited text for clarity and consistency ● Updated references ● Added a Summary of Evidence and Analysis of Evidence
June 2024	● Content clarified without change to clinical indications ● Added Genetics Syndrome and Rare Diseases section ● Added Contraindications and Preferred Studies section in background ● Combination Studies updated ● Updated References

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2001 for Abdomen Computed Tomography (CT)

Guideline Number: Evolut_CG_2001	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Abdomen Computed Tomography (CT) uses radiation to generate images of the organs and structures in the upper abdomen. Abdominal imaging begins at the diaphragm and extends to the umbilicus or iliac crests.

Special Note

- Abdomen CT is used for diseases suspected to be limited to the abdomen. Abdomen and Pelvis CT (CPT Codes: 74176, 74177, 74178) is used when the indication(s) include both the abdomen **AND** pelvis, such as CT Urography, CT Enterography, acute abdominal pain or widespread inflammatory disease.
- When separate requests for CT abdomen and CT Pelvis are encountered for processes involving both the abdomen and pelvis, they need to be resubmitted as Evolent Clinical Guideline 2000 for Abdomen and Pelvis CT (to avoid unbundling; CPT codes 74176, 74177, 74178).

INDICATIONS FOR ABDOMEN CT

Organ Specific Imaging

Adrenal ⁽¹⁾

- Indeterminate adrenal lesion seen on prior imaging
- For follow up of known adrenal mass when a change in tumor is suspected by either imaging, laboratory evaluation and/or symptoms
- Adrenal mass < 4 cm incidentally discovered with benign characteristics (homogenous,

regular borders, HU < 10), one follow-up at 6 months then annually x 2 years (no further imaging if stable) ⁽²⁾

- Adrenal mass ≥ 4 cm and no diagnosis of cancer, can approve for either pre-operative planning **OR** if surgery is not done, repeat imaging in 6-12 months then as clinically indicated (if there is known malignancy, biopsy is typically the next step rather than surveillance imaging) ⁽²⁾
- See **Endocrine Disorders** for additional indications
- See **Imaging in Known Genetic Conditions** for additional screening indications

Liver

- Indeterminate liver lesion seen on prior imaging ⁽³⁾
- Elevated or rising AFP in patients at high risk for Hepatocellular Carcinoma (HCC) (known cirrhosis and/or chronic hepatitis B, Asian male Hepatitis B carriers ≥ 40 y, Asian female Hepatitis B carriers ≥ 50 y, Hepatitis B carriers with + family history of HCC and African and/or North American blacks with hepatitis B) ⁽⁴⁾
- Screening in patients at high risk for HCC (see above) every 6 months when prior ultrasound is insufficient to evaluate the liver due to steatosis/fatty liver or nodular liver
 - The finding of steatosis/fatty liver and/or nodular liver alone on an ultrasound report is insufficient; the report must specify that those findings prevent adequate visualization of the liver by ultrasound
- Jaundice or abnormal liver function tests after equivocal or abnormal ultrasound ⁽⁵⁾
- Follow-up of suspected hepatocellular adenomas every 6-12 months for two years, then annually (sooner if change was noted on last imaging study) ^(6,7)
- Surveillance of patients with primary sclerosing cholangitis every 6-12 months after the age of 20 when MRI is contraindicated or cannot be performed ⁽⁸⁾
- Follow-up of focal nodular hyperplasia (FNH), repeat imaging in 6-12 months to ensure stability. Additional imaging beyond that is needed only if atypical features or diagnosis is still in question ⁽⁶⁾
- See **Imaging in Known Genetic Conditions** for additional screening indications

Pancreas

- Pancreatic cystic lesion found on initial imaging for characterization of lesion ⁽⁹⁾
- Follow-up for pancreatic cyst (including Intraductal Papillary Mucinous Neoplasm (IPMN)) as below **AND** MRI is contraindicated ^(10,11):
 - Incidental and asymptomatic cysts <1.5 cm, **AND**:
 - Age < 65, image annually x 5 years, then every 2 years if stable
 - Age 65-79, imaging every 2 years x 5, then stop if stable
 - Cysts 1.5-1.9 cm with main pancreatic duct communication (MPD), image annually x

- 5 years, then every 2 years x 2, stop if stable at year 9
- Cysts 2.0-2.5 cm with MPD communication, image every 6 months x 4, then annually x 2, then every 2 years x 3, stop if stable at year 10
- Cysts 1.5-2.5 cm with **NO** MPD communication (or cannot be determined), image every 6 mos. x 4, then annually x 2 then every 2 years x 3, stop if stable at year 10
- Cyst > 2.5 cm on surveillance (i.e., intervention has not been chosen), image every 6 mos. x 4, then annually x 2 years, then every 2 years x 3. Stop if stable at year 10
- Patients > 80 years of age at presentation are imaged less frequently: image every 2 years x 2, stop if stable at year 4 (intervals are the same regardless of size if surveillance chosen)
- Growth or suspicious change on a surveillance imaging scan may warrant more frequent surveillance
- Prior to Y90 treatment
- After confirmed diagnosis of exocrine pancreatic insufficiency (EPI), one-time imaging to exclude a secondary cause for EPI. (Imaging is not indicated for workup of suspected pancreatic insufficiency; fecal elastase level < 100 µg/g is consistent with EPI) ⁽¹²⁾
- See **Endocrine Disorders** for additional indications
- See **Genetic Syndromes and Rare Diseases** for additional screening indications

Renal

- Indeterminate renal mass on other imaging ⁽¹³⁾
- Active surveillance for a solid renal mass(es) at 6 and 12 months, then annually ⁽¹⁴⁾
NOTE: more frequent imaging may be indicated if a change in the mass was seen
- Active surveillance for follow-up of a Bosniak IIF, III and IV complex cystic renal lesion(s) ^(15,16):
 - Every 6 months for the first year then
 - Annually for 5 years if no progression
 - If progression or change is seen, then follow-up imaging may be indicated prior to the above intervals.
 - **NOTE:** Bosniak I and II cysts need no further follow-up. (Bosniak I cysts are simple non-enhancing cysts with thin walls, no septa, calcifications or solid components, Bosniak II cysts may contain thin septa, small or fine calcification, minimal enhancement and/or hyperdense and < 3 cm) ⁽¹⁷⁾
- Surveillance of known angiomyolipoma (AML) ⁽¹⁸⁻²⁰⁾:
 - Size > 4 cm: Annually
 - Size 3-4 cm: Every 2 years
 - **NOTE:** if < 3 cm monitoring with advanced imaging (CT/MRI) is not needed unless the pt has known Tuberous Sclerosis ^(19,21)

- AML (any size) in an individual with known tuberous sclerosis (TSC): Annually (including at diagnosis) ^(14,20)
- Post-embolization imaging for AML:
 - One study within the first 6 months, then
 - At one-year post-embolization
 - If stable, further imaging reverts to the above imaging frequency for monitoring (based on size and/or presence of known TSC) ^(22,23)
- See **Genetic Syndromes and Rare Diseases** for additional screening indications

Spleen

- Incidental findings of the spleen that are indeterminate on other imaging ^(24,25)
- See **Imaging in Known Genetic Conditions** for additional screening indications

Endocrine Disorders ⁽²⁾

- For further evaluation of suspected adrenal tumors and/or endocrine disorders when there is clinical and laboratory evidence to suggest an abdominal source ⁽²⁶⁾
 - Suspected adrenocortical carcinoma
 - Elevated adrenal androgens (DHEA-S, androstenedione, testosterone, 17-hydroxyprogesterone)
 - Cushing's Syndrome:
 - ACTH < 5 following dexamethasone suppression
 - ACTH 5-20 (i.e. indeterminate) with CRH/desmopressin stimulation test and ACTH < 5 (post-stimulation)
 - Hyperaldosteronism: Aldosterone > 20 (or Aldosterone: Renin ratio > 20) and Low Plasma Renin Activity
 - Gastrinoma: Elevated serum gastrin
 - GI Carcinoid: Elevated 24-hour urine 5-HIAA or elevated plasma 5-HIAA
 - Glucagonoma: Elevated serum glucagon
 - Hypoglycemia: One of the following:
 - Elevated serum insulin, pro-insulin and c-peptide **ALL** drawn during a period of hypoglycemia (72 hour fast) (i.e. concern for insulinoma)
 - Low serum insulin, low C-peptide and/or elevated IGF-2:IGF-1 ratio
 - Hypercalcemia: Elevated serum calcium, low-normal PTH, high PTHrP **AND** bone imaging (bone scan) does not reveal a source
 - Insulinoma: Elevated serum insulin, pro-insulin and c-peptide **ALL** drawn during a period of hypoglycemia (72 hour fast)
 - Pheochromocytoma/Paraganglioma: Elevated plasma or urine metanephrines and/or

normetanephrines

- PPoma: Elevated serum pancreatic polypeptide
- Somatostatinoma: Elevated serum somatostatin
- VIPoma: Elevated serum VIP

Evaluation of Infection and Inflammation

Pancreatitis: Suspected and Known ⁽²⁷⁾

- Initial imaging for suspected acute pancreatitis due to epigastric pain with elevated amylase and/or lipase ⁽²⁸⁾:
 - For mild presentation when symptom improvement is not seen after 72 hours of treatment and either:
 - Ultrasound has been performed and did not show an abnormality such as gallstones, dilated bile duct
 - Ultrasound suggests complications (such as fluid collection)
 - For severe presentation (such as fever, elevated WBC)
 - For a decline in clinical status and/or suspected complication
- History of pancreatitis, including pancreatic pseudocyst, with abdominal pain suspicious for worsening or re-exacerbation
- Known necrotizing pancreatitis requiring follow-up ⁽²⁸⁾
- In patients > 40 years of age who have pancreatitis with no identifiable cause (to exclude neoplasm)

Infection and Inflammation Limited to the Abdomen ^(27,29)

- Any known infection that is clinically suspected to have created an abscess limited to the abdomen (If location unclear or unknown, CT Abdomen/Pelvis is more appropriate)
- Any history of fistula limited to the abdomen that requires re-evaluation or is suspected to have recurred
- Abnormal fluid collection limited to the abdomen seen on prior imaging that needs follow-up evaluation

Hernia ⁽³⁰⁾

- Suspected hernia and one of the following:
 - Deep intraabdominal/pelvic hernia (post-Roux-en-Y)
 - Non-midline ventral hernia (including Spigelian hernia) ⁽³¹⁾
 - Parastomal hernia
 - Occult, incisional, recurrent or umbilical hernia **AND** exam and ultrasound are non-

diagnostic or equivocal

- Known or suspected hernia with suspected complications based on one or more of the following:
 - Symptoms such as severe pain, vomiting, diarrhea or blood in stool
 - Exam findings such as inability to reduce hernia, severe tenderness, guarding, rebound
 - Complication is suggested on prior imaging ⁽³¹⁾
- Known or suspected Diaphragmatic hernia (e.g. Bochdalek, Morgagni or congenital) or large type IV hiatal hernia ^(32,33)
- Known lower esophageal hernia (such as type II or III hiatal or paraesophageal) and imaging is needed for Surgical planning
- Known abdominal hernia and imaging is needed for surgical planning

Other Indications

- Right upper quadrant pain for suspected biliary disease with negative or equivocal ultrasound ⁽³⁴⁾
- Evaluation of known or suspected non-aortic vascular disease (such as aneurysm, hematomas) after inconclusive ultrasound **AND** CTA/MRA is contraindicated or cannot be performed ⁽³⁵⁾
- Prior to solid organ transplantation
- For abnormal incidental abdominal lymph nodes when follow-up is recommended based on prior imaging and pelvic imaging is not needed (initial 3-month follow-up) ⁽³⁶⁾

Known Malignancy ^(37,38)

Initial Staging or Recurrence

- For initial staging of the majority of cancers, CT Abdomen and Pelvis is the more appropriate study (see Evolent Clinical Guideline 2000 for Abdomen and Pelvis CT).
- Abdomen CT is indicated for initial staging for the following malignancies:
 - Any malignancy with known or suspected liver metastases (i.e. dedicated liver imaging for metastases) ⁽³⁹⁾
 - Esophageal and Esophagogastric Junction Cancers ⁽⁴⁰⁾
 - Melanoma: Uveal ⁽⁴¹⁾
 - Pancreatic Cancer ⁽¹⁴⁾
 - Primary Liver Cancers ⁽⁴²⁾
 - Renal Cell Carcinoma ⁽¹⁴⁾

Restaging

- Abdomen CT is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the following malignancies:
 - Any malignancy with known or suspected liver metastases (i.e. dedicated liver imaging for metastases) ⁽³⁹⁾
 - Esophageal and Esophagogastric Junction Cancers ⁽⁴⁰⁾
 - Melanoma: Uveal ⁽⁴¹⁾
 - Pancreatic Cancer ⁽⁴³⁾
 - Primary Liver Cancers ⁽³⁹⁾
 - Renal Cell Carcinoma ⁽¹⁴⁾

Surveillance

Abdomen CT is indicated during surveillance for the following malignancies at the intervals defined below:

- Any malignancy with a history of liver metastases: every 3-6 months ⁽³⁹⁾
- Esophageal and Esophagogastric Junction Cancers every 3 months for 2 years, then annually for 5 years ⁽⁴⁰⁾
- Hepatocellular Carcinoma every 3 months for 2 years, then every 6 months indefinitely ⁽³⁹⁾
- Melanoma: Uveal - every 6-12 months for 10 years then as clinically indicated ⁽⁴¹⁾
- Renal Cell Carcinoma ⁽¹⁴⁾
 - Stage I – 1-3 months after treatment, then at 6 months and 12 months following treatment then annually
 - Stage II and higher- every 3-6 months for 3 years, then annually for 2 years, then as clinically indicated
- When a cancer is not listed above, Abdomen CT is not routinely a part of surveillance for that cancer in an asymptomatic patient. Please see Evolent Clinical Guideline 2000 for Abdomen and Pelvis CT for additional indications.

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Pre-procedure for transjugular intrahepatic portosystemic shunt (TIPS) ⁽⁴⁴⁾
- Imaging of the area is requested is needed to develop a surgical plan

Postoperative Evaluation:

- Follow-up of known or suspected post-operative complication involving only the abdomen ⁽⁴⁵⁾
- A follow-up study to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed ⁽⁴⁵⁾
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification **AND** finding is expected to be limited to the abdomen
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

Surveillance Screening:

- ADPKD (Autosomal Dominant Polycystic Kidney Disease): annually (including at diagnosis or prior to treatment) ^(46,47)
- ATM: Annually starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) when MRI is contraindicated or cannot be performed ⁽⁴⁸⁾
- BAP1-TPDS (BAP-1 tumor predisposition syndrome) every 2 years starting at age 30 ^(14,49)
- Beckwith-Wiedemann syndrome: when ultrasound is abnormal or AFP is rising ⁽⁵⁰⁾
- Beta-Thalassemia: annually when MRI is contraindicated or cannot be performed ⁽⁵¹⁾
- BHDS (Birt-Hogg-Dube): annually starting at age 20 (or earlier with family history of renal tumors diagnosed before age 30) ^(14,52)
- BRCA2: annually starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) ^(43,53)

- CDKN2A: annually starting at age 40 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) ⁽⁴⁸⁾
- Gaucher Disease: annually (including at diagnosis) when MRI is contraindicated or cannot be performed ⁽⁵⁴⁾
- Hemochromatosis: at diagnosis when MRI is contraindicated or cannot be performed ⁽⁵⁵⁾
- HLRCC (hereditary leiomyomatosis and renal cell cancer) annually starting at age 8 ^(14,56)
- HPRC (hereditary papillary renal carcinoma): annually starting at age 30 ⁽¹⁴⁾
- Multiple Endocrine Neoplasia type 1 (MEN1): annually starting at age 8 ^(57,58)
- Multiple Endocrine Neoplasia type 2 (MEN2): with abnormal biochemical results suggestive of adrenal tumor ⁽⁵⁹⁾
- Hereditary PGL/PCC Syndromes (including SDHx mutations): every 2 years including at diagnosis ^(14,60)
- PRSS1 (Hereditary Pancreatitis; including PRSS1, SPINK1 and other hereditary pancreatitis genes): annually starting 20 years after onset of pancreatitis, or at age 40 years, whichever is earlier when MRI is contraindicated or cannot be performed ⁽⁴⁸⁾
- PTEN: every 2 years (including at diagnosis) starting at age 40 (or 10 years younger than the earliest renal cell cancer diagnosis in the family, whichever is earlier) ⁽⁶¹⁾
- Sickle Cell Disease: annually and MRI is contraindicated or cannot be performed ⁽⁶²⁾
- SKT11 (including Peutz-Jeghers): at diagnosis, annually starting at age 8 ⁽⁶³⁾
- Tuberous sclerosis: annually (including at diagnosis) ^(14,20)
- Von Hippel-Lindau (VHL): annually (including at diagnosis) starting at age 11 ⁽⁶⁴⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Screening Based on Known Genetic Syndrome in combination with Family History:

- Known mutation in other pancreatic susceptibility genes (BRCA1, MLH1 (Lynch), MSH2, MSH6, EPCAM, PALB2, TP53 (Li-Fraumeni)) **AND** ≥ 1 first- or second-degree relative with history of pancreatic cancer from the same side of the family as the identified variant: Annually when MRI is contraindicated or cannot be performed starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier)

Surveillance Screening Based on Family History

- To Screen for Pancreatic Cancer in patients with no identified mutation listed above **AND** the following family history when MRI is contraindicated or cannot be performed:
 - ≥ 2 first-degree relatives with a history of pancreatic cancer from the same side of the family: Annually

- ≥ 3 first- and/or second-degree relatives with a history of pancreatic cancer from the same side of the family: Annually

Special Note

- For syndromes for which imaging starts in the pediatric age group, MRI is preferred to limit lifetime radiation exposure. When CT is requested instead of MRI, a contraindication or relative contraindication to MRI should be provided such as contraindication to sedation if sedation is required for MRI.

OTHER COMBINATION STUDIES WITH ABDOMEN CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen CT and Abdomen CTA (or MRA)

- When needed for clarification of vascular involvement from tumor (including renal vein thrombosis)

Abdomen/Sinus/Maxillofacial/Neck/Chest CT

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (formally Wegener's Granulomatosis) ⁽⁶⁵⁾
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area are needed to guide systemic therapy

Abdomen CT and Abdomen CTA (or MRA) and PET

- Prior to Y90 treatment ⁽⁶⁶⁾

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

74150, 74160, 74170, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine
- Abdominal ultrasound may be limited by the body habitus and BMI (Body Mass Index) and when the abdominal wall thickness impairs visualization of the intra-abdominal contents by ultrasound, CT can be considered without prior ultrasound provided the other guideline criteria for that indication are met

SUMMARY OF EVIDENCE

Diseases of the Abdomen and Pelvis 2018-2021 ⁽¹⁾

Study Design: This chapter provides an overview of adrenal imaging, focusing on the evaluation and management of adrenal masses in various clinical scenarios.

Target Population: Patients with adrenal masses, including those with known biochemical abnormalities, underlying malignancies, or incidental findings.

Key Factors: The document discusses different imaging techniques to differentiate benign from malignant adrenal masses and provides recommended imaging algorithms for the workup of incidental adrenal masses.

Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases ⁽⁷⁾

Study Design: This practice guidance document provides a data-supported approach to the diagnosis, staging, and treatment of hepatocellular carcinoma (HCC), developed by a panel of experts.

Target Population: Patients diagnosed with HCC.

Key Factors: The document covers various aspects of HCC management, including surveillance, diagnosis, and treatment. It emphasizes the importance of imaging and biopsy in the diagnosis and staging of HCC and provides recommendations for different treatment options based on the stage of the disease.

American gastroenterological association institute guideline on the diagnosis and management of asymptomatic neoplastic pancreatic cysts ⁽¹¹⁾

Study Design: This guideline by the American Gastroenterological Association (AGA) provides recommendations for the management of asymptomatic neoplastic pancreatic cysts.

Target Population: Adult patients with asymptomatic pancreatic cysts identified by radiology.

Key Factors: The guideline emphasizes the importance of identifying cysts with early invasive cancer or high-grade dysplasia. It recommends MRI for surveillance and endoscopic ultrasonography with fine-needle aspiration (EUS-FNA) for cysts with high-risk features.

ACR Appropriateness Criteria® Indeterminate Renal Mass ⁽¹³⁾

Study Design: This document outlines guidelines for the evaluation of indeterminate renal masses, developed by a multidisciplinary expert panel and reviewed annually.

Target Population: Patients with indeterminate renal masses detected incidentally.

Key Factors: The guidelines recommend CT and MRI with intravenous contrast as the mainstays of evaluation. Contrast-enhanced ultrasound is also suggested as an alternative for patients with contraindications to CT or MRI contrast.

ACR Appropriateness Criteria® Hernia ⁽³⁰⁾

Study Design: This document provides evidence-based guidelines for the initial imaging of adult patients with suspected abdominopelvic hernias. The guidelines are developed by a multidisciplinary expert panel and are reviewed annually.

Target Population: Adult patients with signs or symptoms prompting suspicion of abdominopelvic hernia.

Key Factors: The document emphasizes the importance of imaging in the diagnosis and management of hernias, recommending CT and ultrasound as first-line modalities. MRI protocols may also be useful, especially in patients with orthopedic instrumentation.

ANALYSIS OF EVIDENCE

Analysis (1,7,11,13,30):

In summary, while all articles highlight the importance of CT imaging in diagnosing various conditions, they differ in their focus on specific conditions, imaging protocols, considerations for radiation exposure, and the use of contrast agents. Garcia et al. (2022) provide detailed appropriateness criteria for imaging hernias, Wang et al. (2020) discuss the characterization of renal masses, and Marrero et al. (2018) address the diagnosis and management of HCC. These differences reflect the unique requirements and considerations for imaging different types of abdominal conditions.

Shared Findings:

- **Importance of CT Imaging:** All articles emphasize the significance of CT imaging in diagnosing various conditions. For instance, Garcia et al. (2022) highlight the role of CT in evaluating abdominal wall hernias, while Wang et al. (2020) discuss its utility in characterizing indeterminate renal masses. Marrero et al. (2018) also underscore the importance of CT in diagnosing hepatocellular carcinoma (HCC).
- **Diagnostic Accuracy:** The articles agree on the high diagnostic accuracy of CT imaging. Garcia et al. (2022) mention the high sensitivity and positive predictive value (PPV) of CT in diagnosing hernias. Similarly, Wang et al. (2020) note the sensitivity and specificity of CT in diagnosing renal cell carcinoma (RCC). Marrero et al. (2018) also highlight the diagnostic performance of multiphase CT in evaluating HCC.
- **Role in Initial Imaging:** CT is commonly recommended as the initial imaging modality. Garcia et al. (2022) suggest CT for initial imaging of suspected abdominal wall hernias. Wang et al. (2020) recommend CT for initial imaging of indeterminate renal masses. Marrero et al. (2018) also advocate for CT in the initial diagnostic evaluation of HCC.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence ● Removed, "One of the following" from Suspected adrenocortical carcinoma in the Endocrine Disorders
June 2025	● This guideline replaces Evolent Clinical Guideline 030 for Abdomen CT ● Purpose revised

Date	Summary
	● Hernia section reorganized and revised ● Genetic and cancer sections updated ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Applicable Line of Business adjusted – Medicare checked ● Updated language in the preoperative/postoperative section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Background reduced ● References updated
June 2024	● Revised the purpose ● Genetics section and Malignancy was reorganized ● Organ section was reorganized ● Fixed typo in pancreas section for mm to be cm ● Renal Bosniak section was adjusted to incorporate background into this section for further clarification ● Polycystic Kidney Disease was updated ● Known Malignancy section was adjusted to indicate initial staging, restaging, and surveillance to be consistent with new cancer bundles coming out ● Background cut ● Added in post-embolization imaging ● Added in CPT code +0722T ● Added in Contraindications and Preferred Studies Statement in Background ● Adjusted Combination section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2005 for Abdomen Pelvis Computed Tomography Angiography (CTA)

Guideline Number: Evolent_CG_2005	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the arteries that can be evaluated for evidence of stenosis, occlusion, or aneurysms with the use of ionizing radiation, which is a potential hazard in patients with impaired renal function.

NOTE: Authorization for CT Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

Special Note

- When vascular imaging of the aorta and both legs is desired (sometimes incorrectly requested as Abdomen and Pelvis CTA & Lower Extremity CTA), only one authorization request is required, using CPT Code 75635 CT Angiography, Abdominal Aorta with Lower Extremity Runoff. This study provides for imaging of the abdomen, pelvis, and both legs.

INDICATIONS FOR ABDOMEN PELVIS CTA

Abdominal Aortic Disease

Abdominal Aortic Aneurysm

- Suspected or known **asymptomatic** abdominal aortic aneurysm (AAA) with **ALL** of the following:
 - Prior ultrasound is inconclusive or insufficient
 - A reason CTA is needed rather than CT has been provided, (e.g., complex vascular

- anatomy or suspected complications)
- The study is ordered at the appropriate AAA screening interval ⁽¹⁾:
 - Aneurysm size 2.5–3 cm, every 10 years
 - Aneurysm size 3.0–3.9 cm, every 3 years
 - Aneurysm size 4.0–4.9 cm, annually
 - Aneurysm size 5.0–5.4 cm, every 6 months
- Known or suspected **symptomatic** AAA ^(1,2)
 - Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate possible aneurysm rupture)
 - Acute abdominal or back pain with a pulsatile or epigastric mass
 - Acute abdominal or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, connective tissue disorder (e.g., Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome), and bicuspid aortic valve ⁽³⁾)

Aortic Syndromes

For initial diagnosis of suspected aortic syndromes and follow-up of known aortic syndromes (such as aortic dissection, intramural hematoma, and penetrating atherosclerotic ulcer)

- Frequency for follow up is as clinically indicated

Postoperative Follow-up of Aortic Repair ^(1,2)

Follow-up for post-endovascular repair (EVAR) or open repair of AAA or abdominal extent of iliac artery aneurysms at the following intervals (CT preferred for routine follow-up):

- Routine, baseline post-EVAR study when a reason CTA rather than CT is needed has been provided (such as complex anatomy or suspected complications) with any **ONE** of the following:
 - Within one month of procedure
 - Continued follow up imaging at the following intervals:
 - If no endoleak or sac enlargement is seen:
 - Annually with past inconclusive or insufficient ultrasound
 - Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
 - If type II endoleak or sac enlargement is seen at any point in time:
 - Every 6 months x 2 years, then annually (does not require prior ultrasound)
- Routine follow up after open repair of AAA when a reason CTA is needed rather than CT

has been provided (e.g., complex vascular anatomy or suspected complications) with any **ONE** of the following:

- Within 1 year postoperatively then
- Annually with past inconclusive or insufficient ultrasound
- Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
- If symptomatic or imaging shows increasing or new findings related to stent graft – more frequent imaging may be needed as clinically indicated
- Suspected complications (such as new onset lower extremity claudication, ischemia, or reduction in ankle brachial index (ABI) after aneurysm repair)
- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, such as pseudoaneurysms, related to surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity

Ischemia or Hemorrhage

- To determine the vascular source of retroperitoneal hematoma or hemorrhage when CT is insufficient to determine the source (CT rather than MRA/CTA is the modality of choice for diagnosing hemorrhage) ⁽⁴⁾
- Evaluation of known or suspected mesenteric ischemia/ischemic colitis ⁽⁵⁾
- To localize active lower gastrointestinal bleeding, or non-localized intermittent bleeding in a hemodynamically stable patient when colonoscopy was unsuccessful, contraindicated or unavailable ^(6–8)

Other Vascular Abnormalities of the Abdomen and Pelvis

- Initial evaluation of inconclusive vascular findings on prior imaging of the abdomen and/or pelvis
- For evaluation or monitoring of non-aortic large vessel or visceral vascular disease of the abdomen (e.g., aneurysm, dissection, arteriovenous malformations (AVM), vascular fistula, intramural hematoma, compression syndromes and vasculitis involving any of the following: inferior vena cava, superior/inferior mesenteric, celiac, hepatic, splenic or renal arteries/veins) ⁽⁹⁾
- As part of an extracardiac vascular assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography ^(10,11)
- Suspected complications of known aneurysm of the abdomen and/or pelvis as evidenced by clinical findings such as new onset of abdominal pain (prior ultrasound is **NOT** required)
- For patients with fibromuscular dysplasia (FMD) ^(12,13):

- One-time vascular study from brain to pelvis
- For patients with Takayasu's Arteritis ⁽¹⁴⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Venous Disease

- Suspected venous thrombosis (including renal vein thrombosis and/or portal venous thrombosis) if previous studies (such as ultrasound) have not resulted in a clear diagnosis ^(15,16)
- Suspected pelvic congestive syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminant **with no contraindications to CT** ⁽¹⁷⁾
- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US and CT ⁽¹⁸⁾
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause when Abdomen and Pelvis (or Pelvis CT) is negative or inconclusive ⁽¹⁸⁾

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽¹⁶⁾
- For imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery ⁽¹⁹⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to the following procedures:
 - Solid organ transplantation
 - Endovascular aneurysm repair (EVAR)
 - Repair of abdominal aortic aneurysm
 - Transcatheter Aortic Valve Replacement (TAVR) ⁽²⁰⁾
 - Imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery ⁽¹⁹⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post-operative complications (e.g., pseudoaneurysms) following interventional vascular procedures (e.g., surgical bypass grafts, vascular stents, and IVC filters)
- Known or suspected complications
- A clinical reason is provided how imaging may change management

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance needed unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²¹⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities
- Marfan syndrome ⁽²²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if either: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending are not adequately visualized on TEE (i.e., advanced imaging is needed to monitor the thoracic aorta)
- Loeys-Dietz ⁽²³⁾:
 - Every two years (including at diagnosis)
 - More frequently if abnormalities are found
- Williams Syndrome ⁽²⁴⁾:
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- Neurofibromatosis Type 1 (NF-1) ⁽²⁵⁾:
 - Development of hypertension (including concern for renal artery stenosis)

- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Diseases

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen and Pelvis CTA or MRA

- Vascular Ehlers-Danlos syndrome (vEDS): every 18 months (including at diagnosis) **OR** ⁽²¹⁾
 - As clinically indicated to follow known vascular abnormalities
- Loeys-Dietz: every two years (including at diagnosis) **OR** ⁽²³⁾
 - More frequently if abnormalities are found

Chest/Abdomen (or Abdomen and Pelvis) CTA

- Marfan syndrome ⁽²²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of the aorta beyond the aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Williams Syndrome ⁽²⁴⁾
 - Abnormal vascular exam or imaging findings (such as concerns for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

OTHER COMBINATION STUDIES WITH ABDOMEN PELVIS CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen and Pelvis CTA/Abdomen and Pelvis CT (or MRI)

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis)

Brain/Neck/Chest/Abdomen and Pelvis CTA or MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to

pelvis is indicated ^(12,13)

- For assessment in patients with spontaneous coronary artery dissection (SCAD), (SCAD is a common initial diagnostic event for underlying fibromuscular dysplasia (FMD)) ⁽¹⁰⁾

NOTE: Body vascular imaging for SCAD can be performed at the time of coronary angiography

Chest/Abdomen (or Abdomen and Pelvis) CTA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) ⁽²⁰⁾
- Acute aortic dissection ⁽²⁶⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Brain/Neck/Chest/Abdomen and Pelvis CTA

- Takayasu's Arteritis ⁽¹⁴⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

CODING AND STANDARDS

Codes

74174

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽¹⁾

Study Design: This document is a guideline report from the American Heart Association (AHA) and American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines. It provides recommendations for the diagnosis and management of aortic disease based on a comprehensive literature search and evidence review.

Target Population: The guidelines are intended for clinicians managing patients with aortic disease, including asymptomatic, stable symptomatic, and acute aortic syndromes.

Key Factors: Recommendations cover genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance. Emphasis on involving patients and multidisciplinary teams in determining optimal therapies, especially for pregnant patients. Guidelines for computed tomography, magnetic resonance imaging, and echocardiographic imaging. Lowered thresholds for surgical intervention in specific scenarios. Importance of institutional volume and expertise in patient outcomes.

ACR Appropriateness Criteria® Radiologic Management of Mesenteric Ischemia: 2022 Update ⁽⁵⁾

Study Design: This document is an update on the ACR Appropriateness Criteria for the radiologic management of mesenteric ischemia. It is based on evidence from peer-reviewed journals and expert panel reviews.

Target Population: Patients with mesenteric ischemia, including those with acute and chronic conditions.

Key Factors: Endovascular interventions such as embolectomy, thrombolysis, and angioplasty are recommended. Endovascular revascularization is preferred, with surgical options considered as alternatives. Transarterial infusion of vasodilators is recommended. Systemic anticoagulation is the initial therapy, with thrombolytic infusion as a secondary option. Importance of CT and MR angiography in identifying the underlying cause and evaluating target vessels

Visceral artery aneurysms ⁽⁹⁾

Study Design: This document is a review article on visceral artery aneurysms, discussing their incidence, causes, clinical presentation, diagnosis, and treatment.

Target Population: Patients with visceral artery aneurysms, including those diagnosed during pregnancy.

Key Factors: Visceral artery aneurysms are rare, often caused by arteriosclerosis, fibromuscular dysplasia, and other conditions. Symptoms vary depending on the affected organ, with larger aneurysms posing a higher risk of rupture. Cross-sectional imaging, Doppler duplex ultrasound, and CT/MR angiography are used for diagnosis. Elective treatment is recommended for aneurysms larger than 2 cm, with endovascular and open surgical options.

ANALYSIS OF EVIDENCE

Analysis ^(1,5,9):

In summary, while all three articles underscore the importance of imaging techniques and the need for a multidisciplinary approach to managing vascular conditions, they differ in their focus on specific conditions, imaging protocols, and treatment recommendations. Detailed guidelines for aortic disease, mesenteric ischemia, and visceral artery aneurysms. These differences highlight the need for tailored approaches to diagnosing and treating various vascular conditions based on the latest evidence and expert recommendations.

Shared Conclusions

- **Importance of Imaging Techniques:** All three articles emphasize the critical role of imaging techniques in diagnosing and managing vascular conditions. Computed Tomography Angiography (CTA) is highlighted as a key diagnostic tool for identifying vascular abnormalities and guiding treatment decisions.
- **Endovascular vs. Surgical Interventions:** There is a consensus that both endovascular and open surgical interventions are viable options for treating vascular conditions. The choice between these approaches depends on the patient's condition, the location and size of the aneurysm, and the availability of expertise.
- **Risk Factors and Patient Management:** All articles discuss the importance of identifying risk factors such as atherosclerosis, genetic predispositions, and other underlying conditions. They also stress the need for a multidisciplinary approach to patient management, involving various specialists to optimize treatment outcomes.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence

Date	Summary
	● Moved further evaluation section under preoperative
June 2025	● This guideline replaces Evolent Clinical Guideline 069 for Abdomen Pelvis CTA ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Moved AAA screening intervals from background to AAA indications section ● Added CTA is needed vs CT due to complex vascular anatomy to the AAA section ● Removed prior imaging requirement for vascular disease ● Added Takayasu's arteritis and its surveillance to Other Vascular Abnormalities section ● Adjusted the language in the Venous Disease section for pelvic congestion syndrome to include nutcracker syndrome and no contraindications to CT ● Added language in the Venous Disease section for acute and chronic unilateral lower extremity edema ● Updated language in the preoperative/postoperative section ● Genetics section surveillance language adjusted in vEDS, Marfan Syndrome, and Loey's Dietz Syndrome sections ● Combinations Studies for Known Genetic Diseases section was added ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Brain added to the Neck/Chest/Abdomen and Pelvis CTA combo with surveillance added to Takayasu's arteritis ● Background reduced
June 2024	● Aortic Revised: separated out aortic syndromes to be more clear ● Added Genetic Syndromes and Tumors Section ● Statement put for contraindications and preferred studies; put in indications and background sections ● Combo section adjusted and made uniform

Date	Summary
	• Updated references and background sections

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2002 for Abdomen Computed Tomography Angiography (CTA)

Guideline Number: Evolut_CG_2002	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the arteries that can be evaluated for evidence of stenosis, occlusion, or aneurysms. It is used to evaluate the arteries of the abdominal aorta and the renal arteries. CTA uses ionizing radiation and requires the administration of iodinated contrast agent, which is a potential hazard in patients with impaired renal function. Abdominal CTA is not used as a screening tool, e.g., evaluation of asymptomatic patients without a previous diagnosis.

NOTE: Authorization for CT Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

Special Note

- For conditions where both abdomen and pelvis imaging are needed and/or the disease process is reasonably expected to involve **BOTH** the abdomen and pelvis (such as for Abdominal Aortic Aneurysm), requests should be resubmitted as Abdomen and Pelvis CTA (CPT 74174). See Evolent Clinical Guideline 2005 for Abdomen/Pelvis CTA for coverage indications.
- When vascular imaging of the aorta and both legs with Runoff is desired (sometimes incorrectly requested as Abd/Pelvis CTA & Lower Extremity CTA), only one authorization request is required, using CPT Code 75635 (CT Angiography, Abdominal Aorta with Lower Extremity Runoff). This study provides for imaging of the abdomen, pelvis, and both legs. See Evolent Clinical Guideline 2006 for Abdominal Aorta CT Angiography with Lower Extremity Runoff for coverage indications.

INDICATIONS FOR ABDOMEN CTA

Renal Artery Stenosis

In a patient with hypertension **AND** prior abnormal or inconclusive ultrasound with any **ONE** of the following ^(1,2):

- Onset of hypertension prior to the age of 30 without a family history of hypertension and when there is suspicion of fibromuscular dysplasia or a vasculitis
- Failure to obtain adequate blood pressure control on 3 antihypertensive medications, including one diuretic
- Recurrent episodes of sudden onset of congestive heart failure (also known as cardiac disturbance syndrome; may have normal left ventricular function)
- Renal failure of uncertain cause with normal urinary sediment and < 1g of urinary protein per day
- Coexisting diffuse atherosclerotic vascular disease, especially in heavy smokers
- Acute elevation of creatinine after initiation of an angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB)
- Malignant or difficult to control hypertension and unilateral small kidney size (noted on prior imaging)
- New onset of difficult to control or labile hypertension after age 55
- Abdominal bruit lateralizing to one side of the abdomen
- Diagnosis of a syndrome with a higher risk of vascular disease, such as neurofibromatosis ⁽³⁾ and Williams' syndrome ⁽⁴⁾

Other Vascular Abnormalities of the Abdomen

- Initial evaluation of inconclusive vascular findings on prior imaging of the abdomen
- For evaluation or monitoring of non-aortic large vessel or visceral vascular disease of the abdomen (e.g., aneurysm, dissection, arteriovenous malformations (AVM), vascular fistula, intramural hematoma, compression syndromes and vasculitis involving any of the following: inferior vena cava, superior/inferior mesenteric, celiac, hepatic, splenic or renal arteries/veins), and the findings are reasonably expected to be limited to the abdomen ⁽⁵⁾
- Suspected complications of known aneurysm of the abdomen as evidenced by clinical findings such as new onset of abdominal pain (prior ultrasound is **NOT** required)
- Takayasu's Arteritis ⁽⁶⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Venous Disease

- Suspected venous thrombosis (including renal vein thrombosis and/or portal venous thrombosis) if previous studies (such as ultrasound) have not resulted in a clear diagnosis and the disease is confined to the abdomen ^(7,8)

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ⁽⁹⁾
- Prior to Y90 treatment ⁽¹⁰⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to the following procedures:
 - Solid organ transplantation
 - UPJ (ureteropelvic junction) obstruction surgery prior to Y90 treatment ⁽¹⁰⁾
 - Trans jugular intrahepatic portosystemic shunt (TIPS) when ultrasound indicates suspected complications ⁽¹¹⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post-operative complications, (e.g., pseudoaneurysms) following interventional vascular procedures (e.g., surgical bypass grafts, vascular stents, trans jugular intrahepatic portosystemic shunt (TIPS), and IVC filters)
- Known or suspected complications
- A clinical reason is provided how imaging may change management

Note: This section applies only within the first few months following surgery

IMAGING IN KNOWN GENETIC CONDITIONS

- Marfan syndrome ⁽¹²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on

Transthoracic Echocardiogram (TTE) (i.e. advanced imaging is needed to monitor the thoracic aorta)

- Williams Syndrome ⁽⁴⁾:
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- Neurofibromatosis Type 1 (NF-1) ⁽³⁾:
 - Development of hypertension (including concern for renal artery stenosis)
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Chest/Abdomen/Pelvis CTA

- Marfan syndrome ⁽¹²⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)^(2,20)
- Williams Syndrome ⁽⁴⁾:
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

OTHER COMBINATION STUDIES WITH ABDOMEN CTA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen CT/Abdomen CTA

- When needed for clarification of vascular involvement from tumor (including renal vein thrombosis)

Abdomen CT (or MRI)/Abdomen CTA/PET

- Prior to Y90 treatment ⁽¹⁰⁾

Chest/Abdomen CTA

- Evaluation of extensive vascular disease involving the chest and abdominal cavities when pelvic imaging is not needed
- Significant post-traumatic or post-procedural vascular complications when pelvic imaging is not needed

Chest/Abdomen/Pelvis CTA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present
- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) ⁽¹³⁾
- Acute aortic dissection ⁽¹⁴⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Brain/Neck/Chest/Abdomen/Pelvis CTA

- Takayasu's Arteritis ⁽⁶⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

CODING AND STANDARDS

Codes

74175

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR–SIR Practice Parameter for the Performance of Angiography, Angioplasty, and Stenting for the Diagnosis and Treatment of Renal Artery Stenosis in Adults ⁽¹⁾

Study Design: The document outlines the practice parameters for the performance of angiography, angioplasty, and stenting for the diagnosis and treatment of renal artery stenosis (RAS) in adults. It is a comprehensive guideline developed collaboratively by the American College of Radiology (ACR) and the Society of Interventional Radiology (SIR).

Target Population: The target population includes adults with hypertension, particularly those with renovascular hypertension (RVH) due to renal artery stenosis. The document highlights that hypertension is a common problem, affecting up to 45% of adults in the United States. It also mentions that the incidence of RVH varies in the literature from 0% to 29%, with a weighted mean of about 4% in an analysis of 12 studies and 8,899 patients.

Key Factors: RAS can be caused by different etiologies, including atherosclerotic RAS (ARAS), which increases with age and the presence of associated cardiovascular risk factors. Certain clinical scenarios significantly increase the likelihood that ARAS is contributing to hypertension and/or chronic renal insufficiency (CRI), such as abrupt onset of labile or poorly controlled hypertension in a patient older than 55 years of age, sudden worsening of stable hypertension

or CRI, and episodes of acute onset of congestive heart failure despite normal left ventricular heart function. The document reviews the literature and circumstances that should prompt further evaluation of a patient with RAS as a potential cause for RVH or contributing factor to CRI. It discusses both noninvasive imaging and catheter-based angiographic evaluation of such patients and the criteria for determining whether an endovascular intervention has been successful.

ACR Appropriateness Criteria® Renovascular Hypertension ⁽²⁾

Study Design: The document provides the ACR Appropriateness Criteria for renovascular hypertension, developed by expert panels on urologic imaging and vascular imaging. It includes evidence-based guidelines for specific clinical conditions, reviewed annually by a multidisciplinary expert panel.

Target Population: The target population includes patients with renovascular hypertension, which is the most common type of secondary hypertension. The prevalence of renovascular hypertension is estimated to be between 0.5% and 5% of the general hypertensive population, with an even higher prevalence among patients with severe hypertension and end-stage renal disease, approaching 25% in elderly dialysis patients.

Key Factors: Investigation for renal artery stenosis (RAS) is appropriate when the clinical presentation suggests secondary hypertension rather than primary hypertension, and when intervention would be carried out if a significant RAS were identified. The primary imaging modalities used to screen for RAS are CT, MRI, and ultrasound, with the selection of imaging dependent in part on renal function. The document discusses the appropriateness of various imaging techniques, including duplex Doppler ultrasound, captopril renal scintigraphy, MR angiography, and CT angiography. The document provides detailed information on the sensitivity and specificity of different imaging modalities for diagnosing RAS. For example, duplex Doppler ultrasound has a sensitivity of 91% and a specificity of 75% for a peak systolic velocity (PSV) cutoff value of 200 cm/s. The document discusses the predictive value of imaging techniques in identifying patients who will respond to revascularization. For instance, captopril renal scintigraphy has a reported sensitivity of 81% and a positive predictive value of 51% in some studies.

ANALYSIS OF EVIDENCE

Analysis ^(1,2):

Both articles agree on the effectiveness and advantages of CTA for diagnosing RAS, as well as the observation of secondary signs. However, they differ in their conclusions regarding the risk of nephrotoxicity, the accuracy of CTA in diagnosing stenosis, and its use in patients with impaired renal function.

Shared Findings:

- **Effectiveness of CTA:** Both articles agree that CTA is an effective modality for diagnosing RAS. CTA provides accurate anatomic images of the renal arteries with isotropic data sets that enable high-resolution reconstructions in any plane.

- **Advantages of CTA:** Both articles highlight the advantages of CTA, such as less invasiveness, faster acquisitions, and multiplanar imaging, CTA is less invasive compared to arteriography, and the ability to assess patency of renal stents.
- **Secondary Signs:** Both articles discuss secondary signs that can be observed with CTA (poststenotic dilatation, renal atrophy, and decreased cortical enhancement as secondary signs and cortical area and mean cortical thickness as morphologic markers of atherosclerotic renal disease).

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence
June 2025	● This guideline replaces Evolent Clinical Guideline 034-1 for Abdomen CTA (Angiography) ● Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices ● Removed Abdominal Aortic Disease section ● Updated language in the preoperative/postoperative section ● Added Combinations Studies for Known Genetic Diseases section ● Genetics section surveillance language adjusted in Marfan and Williams section ● Added Combination Studies for Known Genetic Conditions section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Brain added to the Neck/Chest/Abdomen/Pelvis CTA combo with surveillance added to Takayasu's arteritis ● Background reduced
June 2024	● Separated out aortic syndromes to be more clear ● EVAR studies clarified order of which studies would be ordered ● Renal artery stenosis: updated per new clinical guidance ● Added Genetic Syndromes and Tumors Section

Date	Summary
	• Statement put in all Guidelines for contraindications put in indications and background sections • Combo section adjusted and made uniform • Updated references and background section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2000 for Abdomen Pelvis Computed Tomography (CT)

Guideline Number: Evolut_CG_2000	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Abdomen and Pelvis Computed Tomography (CT) uses radiation to generate images of the organs and structures in the abdomen and pelvis.

INDICATIONS FOR ABDOMEN/PELVIS CT

Evaluation of Abdominal Pain of Unknown Etiology

- After initial workup of abdominal pain including laboratory evaluation and initial imaging has not revealed a cause when results of the following are provided ⁽¹⁾:
 - Appropriate laboratory testing (chemistry profile, complete blood count, and/or urinalysis) for the patient's presentation (e.g., suprapubic pain – UA, suspected pancreatitis – amylase/lipase etc.) **AND**
 - Initial imaging (such as ultrasound, barium study, nuclear medicine, or scope study) appropriate to the symptoms
 - E.g., for gastrointestinal (GI) bleeding, Complete Blood Count (CBC) and a scope study would be appropriate initial testing (however, a UA and ultrasound would not be)

NOTE: Not all of the above tests need to be performed, but both labs and initial imaging need to be performed

- For acute abdominal pain in a patient over the age of 65 ⁽²⁾
- Initial evaluation of abnormal findings seen on other imaging, such as ultrasound (US) or x-ray, both the abdomen and pelvis are likely affected, and CT is the most reasonable next step for that diagnosis

Inflammatory Bowel Disease (3–5)

- For evaluation of Inflammatory Bowel Disease (IBD) such as Crohn's or Ulcerative Colitis (includes CT enterography, however, MRI should be considered for age < 35 to reduce radiation exposure)
 - For suspected inflammatory bowel disease after complete work up including physical exam, labs, and recent colonoscopy
 - Known inflammatory bowel disease with recurrence or worsening signs/symptoms requiring re-evaluation or for monitoring therapy

Evaluation of Inflammation and Infection

Peritonitis

Suspected or known recent peritonitis **AND** at least one of the following ^(6,7):

- Rebound, guarding (not voluntary) or rigid abdomen, **OR**
- Severe tenderness to palpation present over entire abdomen

Diverticulitis or Acute Appendicitis (8,9)

- Suspected diverticulitis or acute appendicitis for initial imaging with at least **ONE** of the following ⁽¹⁰⁾:
 - WBC Elevated
 - Fever
 - Anorexia
 - Nausea and vomiting

NOTE: If CT is requested for a pregnant woman with suspected appendicitis, ultrasound needs to be insufficient and a contraindication to MRI provided ⁽¹¹⁾

- Suspected appendicitis in a child (< age 18) ⁽¹²⁾ when ultrasound is inconclusive or cannot be completed (due to body habitus or inability to cooperate) **OR** when peritoneal signs are present (guarding, rebound) or other red flags
- Suspected diverticulitis when ⁽¹³⁾:
 - Pain is present in the LLQ (< 3 months duration), medical records note suspicion for diverticulitis, the patient has no prior history of diverticulitis **AND** either:
 - LLQ tenderness is present on exam; **OR**
 - Patient is immunocompromised; **OR**
 - Patient has a history of diverticulitis, symptoms are similar to prior episodes, **AND** patient has failed treatment currently (treatment could be liquid diet or antibiotic)
- Complications of diverticulitis (diagnosed either clinically or by imaging) with severe abdominal/pelvic pain or severe tenderness or mass not responding to antibiotic

treatment ⁽⁹⁾

Pancreatitis ⁽¹⁴⁾

Suspected or known acute pancreatitis when there is a reason to suspect extension beyond abdomen into pelvis and one or more of the following:

- Initial imaging for suspected acute pancreatitis due to epigastric pain with elevated amylase and/or lipase:
 - Mild presentation when symptom improvement is not seen after 72 hours of treatment and either:
 - Ultrasound has been performed and did not show an abnormality such as gallstones, dilated bile duct
 - Ultrasound suggests complications (such as fluid collection)
 - Severe presentation (such as fever, elevated WBC)
 - Decline in clinical status and/or suspected complication
- Known necrotizing pancreatitis requiring follow-up
- Pancreatitis by history (including pancreatic pseudocyst) with continued abdominal pain, early satiety, nausea, vomiting, or signs of infection greater than 4 weeks from initial presentation

Other Causes of Inflammation or Infection

- Any known infection that is clinically suspected to have created an abscess in the abdomen and pelvis
- For acute non-localized abdominal pain and fever ⁽⁶⁾
- Any history of fistula that requires re-evaluation or is suspected to have recurred in the abdomen and pelvis
- Abnormal fluid collection seen on prior imaging that needs follow-up evaluation
- For suspected retroperitoneal fibrosis after labs and ultrasound have been completed and other etiologies for symptoms have been excluded (retroperitoneal fibrosis is a diagnosis of exclusion) ^(15,16)
- For known retroperitoneal fibrosis to determine extent of disease

Gastrointestinal

Suspected Small Bowel Obstruction

- Crampy pain, vomiting, distention, high pitched or absent bowel sounds, prior history of abdominal surgery, or based on initial x-ray ⁽¹⁷⁾

Gastrointestinal Hemorrhage and Ischemia

- Suspected colonic or mesenteric ischemia (CTA also appropriate) ⁽¹⁸⁾

- Suspected small bowel bleeding when endoscopy and capsule endoscopy are inconclusive or negative ⁽¹⁹⁾

Genitourinary

Evaluation of Hematuria ⁽²⁰⁾

- Kidney Stone is **NOT** suspected **AND**
- Urinalysis is negative for infection **or** hematuria persists on urine microscopy following treatment of urinary tract infection **AND**
- At least one of the following:
 - Gross hematuria
 - > 25 RBC/hpf on urine microscopy
 - 3-25 RBC/hpf on urine microscopy **AND ONE** or more of the following:
 - >30 pack year smoking history
 - Male ≥ age 60
 - Abnormal renal ultrasound
 - Negative renal ultrasound and repeat sample shows persistence of ≥ 3 RBC/hpf

NOTE: There is not a separate CPT code for CT Urography (CTU); when needed this will be submitted as CT abdomen/pelvis. If a CT abdomen/pelvis has been done (with and without contrast), and a CTU is later requested, the previous CT must show a clear reason that additional delayed post-contrast images of the collecting system are needed.

Known or Suspected Kidney or Ureteral Stone ^(21–23)

- Acute flank pain (< 2 weeks) and high suspicion for stone
- Subacute or chronic flank pain and one of the following:
 - Abnormal ultrasound
 - Fever or WBC > 15,000
 - Inadequate analgesia
 - KUB shows possible kidney stone
- Known stones with recent indeterminate imaging (ultrasound or KUB) when additional imaging may change management

Preoperative Urinary Stone Planning ⁽²⁴⁾

- No recent CT has been performed within the past 6 weeks **OR**
- If passage or movement of stones is suspected and imaging may change management

Postoperative Urinary Stone Follow-up CT ⁽²⁵⁾

- Symptomatic patients following:
 - Ureteroscopic extraction of an intact stone
 - Ureteroscopy with lithotripsy/fragmentation of a radiolucent stone
 - Percutaneous Nephrolithotomy
- Further evaluation of hydronephrosis seen on post-operative ultrasound

Evaluation of Pyelonephritis ^(26,27)

When other imaging such as ultrasound is abnormal:

- For a patient who remains febrile after 72 hours of treatment or has deterioration in clinical status
- With the one following co-morbid conditions: personal history of stone disease or renal obstruction, recurrent pyelonephritis, vesicoureteral reflux, immune compromise, prior renal transplant with native kidneys in place, advanced age or lack of response to initial therapy (based on culture)

Evaluation of Complicated Urinary Tract Infection ⁽²⁶⁾

- **Women:** UTI is considered complicated (and therefore imaging (ultrasound and/or CT) is warranted) in any of the following situations (may be done after resolution of infection):
 - Immunocompromised host
 - Persistence of bacteria or symptoms after culture specific treatment
 - Rapid recurrence with same bacteria after treatment
 - Multidrug resistant bacteria
 - When there is suspicion of renal calculi or obstruction ⁽²⁸⁾
- **Men:** Any UTI is considered complicated due to high likelihood of anatomic abnormalities; therefore imaging (ultrasound and/or CT) is indicated ⁽²⁹⁾

Abdominal Aortic Disease

Abdominal Aortic Aneurysm (AAA)

- Suspected or known **asymptomatic** abdominal aortic aneurysm (AAA) with **ALL** of the following:
 - Prior ultrasound is inconclusive or insufficient
 - The study is ordered at the appropriate AAA surveillance intervals ⁽³⁰⁾:
 - Aneurysm size 2.5-3 cm, every 10 years
 - Aneurysm size 3.0-3.9 cm, every 3 years
 - Aneurysm size 4.0-4.9 cm, annually

- Aneurysm size 5.0-5.4 cm, every 6 months
- Known or suspected **symptomatic** AAA ^(30,31)
 - Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate possible aneurysm rupture)
 - Acute abdominal or back pain with a pulsatile or epigastric mass
 - Acute abdominal or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, connective tissue disorder (Such as Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome), and bicuspid aortic valve) ⁽³²⁾

Postoperative Follow-up of Aortic Repair ^(30,31)

Follow-up for post-endovascular repair (EVAR) or open repair of AAA or abdominal extent of iliac artery aneurysms at the following intervals (CT preferred for routine follow-up):

- Routine, baseline post-EVAR study with any **ONE** of the following:
 - Within 1 month of the procedure
 - Continued follow-up at the following intervals:
 - If no endoleak or sac enlargement is seen:
 - Annually with past inconclusive or insufficient ultrasound
 - Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
 - If type II endoleak or sac enlargement is seen at any point in time:
 - Every 6 months x 2 years, then annually (does not require prior ultrasound)
- Routine follow-up after open repair of AAA with any **ONE** of the following:
 - Within 1 year postoperatively then
 - Annually with past inconclusive or insufficient ultrasound then
 - Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)

NOTE: If symptomatic or imaging shows increasing or new findings related to stent graft, more frequent imaging may be needed as clinically indicated

- Suspected complication (such as, new-onset lower extremity claudication, ischemia, or reduction in ankle brachial index (ABI) after aneurysm repair)
- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, such as pseudoaneurysms, related to

surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity

Hernia (33,34)

- Suspected hernia and one of the following:
 - Deep intraabdominal/pelvic hernia (post-Roux-en-Y, obturator, sciatic or perineal)
 - Non-midline ventral hernia (including Spigelian hernia)
 - Parastomal hernia
 - Occult, incisional, recurrent or umbilical hernia and exam **AND** ultrasound are non-diagnostic or equivocal
 - Inguinal hernia and exam **AND** ultrasound are non-diagnostic or equivocal **AND** reason upper abdominal imaging is needed is provided
 - Umbilical hernia and exam **AND** ultrasound are non-diagnostic or equivocal **AND** reason upper abdominal imaging is needed is provided
- Known or suspected hernia with suspected complications based on one or more of the following:
 - Symptoms such as severe pain, vomiting, diarrhea or blood in stool
 - Exam findings such as inability to reduce hernia, severe tenderness, guarding, rebound
 - Complication is suggested on prior imaging
- Known hernia and imaging is needed for surgical planning
 - Inguinal hernia needs reason upper abdominal imaging is needed (otherwise CT Pelvis is indicated)
 - Umbilical hernia needs reason pelvic imaging is needed (otherwise CT Abdomen is indicated)

Other Indications for Abdomen/Pelvic CT Combo (35)

- For fever of unknown origin (temperature of ≥ 101 degrees for a minimum of 3 weeks) after all of the following has been completed and a source is not identified: complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, serologic testing (EBV, EMV, HIV and hepatitis), tuberculin test. ⁽³⁶⁾
- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause ⁽³⁷⁾
- Suspected pelvic congestion syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminate ⁽³⁸⁾
- For further evaluation of a new onset or non-reducible varicocele ⁽³⁹⁾

Transplants

- Prior to solid organ transplantation
- For initial workup prior to Bone Marrow Transplantation (BMT)

Trauma ⁽⁴⁰⁾

- Suspected retroperitoneal hematoma or hemorrhage based on lab or physical findings
- Blunt injury with suspicion of multisystem trauma and hematuria
- Penetrating abdominal injury with suspicion of multisystem trauma with or without hematuria

Suspected Malignancy

- Unconfirmed diagnosis of cancer, for further evaluation of indeterminate or questionable findings:
 - Initial evaluation of suspicious masses/tumors found by physical exam or imaging study, such as ultrasound (US) ^(41,42)
 - One follow-up exam to ensure no suspicious change has occurred in a tumor. No further surveillance imaging unless tumor(s) is/are specified as highly suspicious, or change was found on exam or last follow-up imaging.
 - Abnormal incidental abdominopelvic lymph nodes when follow-up is recommended based on prior imaging (initial 3-month FU) ⁽⁴³⁾
 - Follow-up of mesenteric panniculitis or lymphadenitis when another diagnosis is suspected or there is a failure of symptom resolution ^(44,45)
- Weight loss and **ONE** of the following:
 - Clinically significant unintentional weight loss i.e., ≥5% of body weight in less than 12 months (or ≥ 2% in one month), with signs or symptoms suggestive of an abdominal cause
 - Ongoing unexplained clinically significant weight loss i.e., ≥5% of body weight in less than 12 months (or ≥ 2% in one month) ⁽⁴⁶⁾ after initial workup (Chest x-ray, age appropriate cancer screening (such as colonoscopy and mammography) and labs (including CBC, CMP, HbA1C, TSH, stool hemoccult, ESR/CRP, HIV, Hepatitis C)) has been completed, no cause identified, and second visit documenting further decline in weight ⁽⁴⁷⁾
- Documentation of concern for malignancy (i.e. lymphoma) and any one of the following B symptoms:
 - Fevers > 101°F
 - Drenching night sweats
 - Unexplained weight loss of > 10% body weight
- Suspected paraneoplastic syndrome (including dermatomyositis) when appropriate

workup has been done and there is a suspicion of malignancy

- Suspected Pheochromocytoma/Paraganglioma and elevated plasma or urine metanephrines and/or normetanephrines
- For suspected gestational trophoblastic disease when chest imaging suggests distant disease ⁽⁴⁸⁾
- Persistently elevated carcinoembryonic antigen (CEA) in a patient with no cancer history after completing clinical workup (including laboratory evaluation (including CBC, CMP, repeat CEA), initial imaging (ultrasound) and colonoscopy), no cause is identified and CEA is >10 ng/ml, or fails to drop below 5 ng/ml after 3-6 months intervals
- For evaluation of thrombocytosis or thrombocytopenia when one or more of the following are present:
 - Any additional cytopenia (i.e., leukopenia, anemia)
 - LDH elevation
 - Splenomegaly on exam or imaging
 - Palpable lymphadenopathy
 - Bone marrow biopsy has been completed and concern for myeloproliferative disorder persists
 - Genetic mutation increasing risk of myeloproliferative disorder (such as JAK-2 mutation) on peripheral smear or bone marrow biopsy ⁽⁴⁹⁾

Known Malignancy

Initial Staging or Recurrence

- Abdomen and Pelvis CT is appropriate for initial staging of the majority of malignancies when either biopsy proven or suspected based on prior imaging

Restaging

- Abdomen and Pelvis CT is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the majority of cancers
- Abdomen and Pelvis CT is indicated **in addition to PET** while on active treatment every 2-3 cycles of chemo or immunotherapy for the following:
 - Hodgkin Lymphoma ⁽⁵⁰⁾
 - Pediatric Aggressive Mature B-Cell Lymphomas ⁽⁵¹⁾
 - Pediatric Hodgkin Lymphoma ⁽⁵²⁾

Surveillance

Abdomen and Pelvis CT is indicated during surveillance for the following malignancies at the intervals defined below:

NOTE: For any patient with stage IV cancer (any type) that is either in remission or on a treatment break, Abdomen and Pelvis CT is indicated every 3-6 months

- Adrenocortical Carcinoma: every 3-12 months for 5 years then as clinically indicated ⁽⁵³⁾
- Anal Carcinoma: every 3-6 months for 1-2 years, then every 6-12 months for an additional year ⁽⁵⁴⁾
- Biliary Tract Cancers (Ampullary Adenocarcinoma, Cholangiocarcinomas and Gallbladder): every 3-6 months for 2 years then every 6-12 months for up to 5 years then as clinically indicated ⁽⁵⁵⁾
- Bladder Cancer ⁽⁵⁶⁾:
 - Non-muscle invasive:
 - Low risk and Intermediate risk: once at baseline at end of treatment then at clinically indicated
 - High risk: once at baseline then annually until 10 years from end of treatment then as clinically indicated
 - **NOTE:** High risk bladder cancer is defined as high grade (Grade 3) tumor **AND** any one of the following: associated CIS, T1, tumor > 3 cm or multifocal, BCG refractory (unresponsive to BCG), variant histology (micropapillary, plasmacytoid, small cell), presence of lymphovascular invasion, or prostatic urethral invasion
 - Muscle Invasive OR Urothelial carcinoma of the upper urinary tract, prostate or urethra: every 3-6 months for 2 years, then annually for up to 5 years then as clinically indicated
- Bone Tumors and Sarcomas (Chondrosarcoma, Chordoma, Giant Cell Tumor of Bone, Ewing Sarcoma, Soft Tissue Sarcoma, Osteosarcoma) ^(57,58)
 - Every 3-6 months for 5 years, then annually for an additional 5 years then as clinically indicated
- Colon Cancer ⁽⁵⁹⁾:
 - Stage II: every 6-12 months for 5 years, then as clinically indicated
 - Stage III: every 3 months for 2 years, then every 6-12 months for 3 years, then as clinically indicated
- Esophageal and Esophagogastric Junction Cancers: every 3-6 months for 2 years, then annually for up to 5 years ⁽⁶⁰⁾
- Gastric Cancer: every 6 months for 2 years, then annually up to 5 years then as clinically indicated ⁽⁶¹⁾
- Gastrointestinal Stromal Tumors (GIST): every 3-6 months for 3-5 years, then annually ⁽⁶²⁾
- Hepatocellular Carcinoma: every 3-6 months for 2 years, then every 6 months indefinitely ⁽⁶³⁾
- Lymphoma (Follicular, Diffuse Large B-Cell, Burkitt, Hodgkin, Marginal Zone, T-Cell) and

Hairy Cell Leukemia ^(64–66):

- Every 3-6 months for 2 years, then annually
- Melanoma: Cutaneous (stage II or higher): every 3-12 months for 2 years then every 6-12 months for 3 years, then as clinically indicated ⁽⁶⁷⁾
- Merkel Cell Carcinoma every 3-6 months for 3 years, then every 6-12 months indefinitely ⁽⁶⁸⁾
- Mesothelioma (Pleural and Peritoneal): every 3-6 months for 5 years then annually until 10 years, then as clinically indicated ^(69,70)
- Neuroblastoma: every 3 months for 1 year, then every 6-12 months for 2 years, then as clinically indicated ⁽⁷¹⁾
- Neuroendocrine Tumors: every 3-6 months for 5 years then every 6-12 months for 5 years, then as clinically indicated ⁽⁵³⁾
- Occult Primary Tumors: follow indications based on how cancer is being treated (e.g. if treating as head and neck, defer to head and neck cancer guidance for all future requests). If tumor type is unclear: every 3-6 months for 2 years, then every 6-12 months for 3 years then annually ⁽⁷²⁾
- Ovarian cancer: every 3-6 months for 2 years then every 6-12 months for 3 years ⁽⁷³⁾
- Pancreatic cancer: every 3-6 months for 2 years, then every 6-12 months as clinically indicated ⁽⁷⁴⁾
- Penile cancer: Every 3-6 months for 2 years, then every 6-12 months for an additional 3 years, then as clinically indicated ⁽⁷⁵⁾
- Prostate Cancer: as clinically indicated ⁽⁷⁶⁾
- Renal Cell Carcinoma ⁽⁷⁷⁾:
 - Stage I: 1-3 months after treatment, then at 6 months and 12 months following treatment then annually
 - Stage II and higher: every 3-6 months for 3 years, then annually for 2 years, then as clinically indicated
- Rectal Cancer ⁽⁷⁸⁾:
 - Stage II, III: every 6-12 months for 5 years, then as clinically indicated
- Small Bowel Adenocarcinoma: every 6-12 months for 5 years then as clinically indicated ⁽⁷⁹⁾
- Small Cell Lung Cancer: every 2 months for the first year, every 3-4 months for years 2 and 3 then every 6 months during years 4 and 5 then annually ⁽⁸⁰⁾
- Soft Tissue Sarcoma: every 3-6 months for 2 years, then every 6-12 months for 3 years, then annually as clinically indicated ⁽⁵⁸⁾
- Testicular cancer: every 3 months for 1 year, then every 6 months for 1 year then annually for 2 years then as clinically indicated ⁽⁸¹⁾

- Wilm's Tumor: every 3 months for 2 years then every 6 months for 2 years then as clinically indicated ⁽⁸²⁾

When a cancer is not listed above, Abdomen and Pelvis CT is not routinely a part of surveillance for that cancer in an asymptomatic patient. There would need to be a sign or symptom of recurrence to consider Abdomen and Pelvis CT.

When the timeframe above for routine surveillance has elapsed, there would need to be a sign or symptom of recurrence to consider Abdomen and Pelvis CT.

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline (see preop/postop urinary stone):

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- BHDS (Birt-Hogg-Dube): Annually starting at age 20 (or earlier with family history of renal tumors diagnosed before age 30 ^(77,83))
- FAP (Familial Adenomatous Polyposis): Annually ⁽⁸⁴⁾
- MEN1 (Multiple Endocrine Neoplasia type 1): annually starting at age 9 ^(85,86)
- STK11 (Peutz-Jeghers Syndrome): Annually starting at age 8 ⁽⁸⁷⁾

- William's Syndrome: Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis) ⁽⁸⁸⁾
- Vascular Ehlers-Danlos (vEDS) **AND** acute abdominal pain ⁽⁸⁹⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Neck/Chest/Abdomen/Pelvis CT

- Hereditary PGL/PCC Syndromes (including SDHx mutations): Every 2 years (including at diagnosis) **AND** MRI is contraindicated or cannot be performed ^(77,90)

OTHER COMBINATION STUDIES WITH ABDOMEN PELVIS CT

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated.

Abdomen and Pelvis CTA / Abdomen and Pelvis CT

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis)

Chest/Abdomen and Pelvis CT

- As numerous disease processes, including but not limited to malignancy, may affect the chest, abdomen and pelvis, this combination is indicated when the guideline criteria for **BOTH** Chest CT and Abdomen and Pelvis CT have been met.
- Documentation of concern for malignancy (such as lymphoma) and any **ONE** of the following B symptoms:
 - Fevers > 100° F
 - Drenching night sweats
 - Unexplained weight loss of > 10% body weight

Chest/Abdomen and Pelvis CT / PET

- CT of the original sites of disease is indicated **in addition to PET** while on active treatment every 2-3 cycles of chemo or immunotherapy for the following: Hodgkin Lymphoma, Pediatric Aggressive Mature B-Cell Lymphomas, Pediatric Hodgkin Lymphoma

Sinus/Chest/Abdomen and Pelvis CT / Brain MRI

- Prior to all types of Bone Marrow Transplantation

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine.

CODING AND STANDARDS

Codes

74176, 74177, 74178, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Paraneoplastic Syndromes

Suspected paraneoplastic syndromes with no established cancer diagnosis: laboratory evaluation and imaging.

The laboratory evaluation for paraneoplastic syndrome is complex. If the appropriate lab test results are suspicious for malignancy, imaging is indicated.

For SIADH (hyponatremia + increased urine osmolality), there is a high association with small cell lung cancer, therefore imaging typically starts with chest CT. If other symptoms suggest a different diagnosis other than small cell lung cancer, different imaging studies may be reasonable.

For hypercalcemia (high serum calcium, low-normal PTH, high PTHrP) it is reasonable to start with bone imaging followed by a more directed evaluation such as mammogram, chest, abdomen, and pelvis imaging as appropriate.

For Cushing syndrome (hypokalemia, normal-high midnight serum ACTH NOT suppressed with dexamethasone) abdominal and chest imaging is reasonable. If dexamethasone suppression test DOES suppress ACTH, pituitary MRI is reasonable.

For hypoglycemia, labs drawn during a period of hypoglycemia (glucose < 55, typically a 72 hour fast) (insulin level, C-peptide, and IGF-2:IGF-1 ratio) should be done to evaluate for an insulinoma. An elevated insulin level, elevated C-peptide and/or normal IGF-2:IGF-1 ratio warrant CT or MRI abdomen to look for insulinoma. A low insulin, low C-peptide and/or elevated IGF-2:IGF-1 ratio warrant chest and abdominal imaging.

When a paraneoplastic neurologic syndrome is suspected, nuclear and cytoplasmic antibody panels are often ordered to further identify specific tumor types. Results are needed prior to imaging. Because these tests are highly specific, if an antibody highly associated with a specific cancer is positive, then further imaging for that cancer is reasonable. For example, anti-Hu has a high association with SCLC and chest CT would be reasonable. Anti-MA2 has a high association with testicular cancer and testicular ultrasound would be a reasonable next step.

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Imaging of acute pelvic pain ⁽¹⁾

Study Design: This document is a review article discussing the imaging of acute pelvic pain.

Target Population: Patients of all age groups presenting with acute pelvic pain.

Key Factors: The article highlights the differential diagnosis of acute pelvic pain, including gynecologic and non-gynecologic causes. It emphasizes the use of ultrasonography, CT, and MRI for fast and accurate diagnosis. The document also discusses specific conditions such as ovarian cyst rupture, pelvic inflammatory disease, ovarian torsion, myoma degeneration, and more.

ACR Appropriateness Criteria® Crohn Disease ⁽⁴⁾

Study Design: This document is part of the ACR Appropriateness Criteria, focusing on Crohn disease.

Target Population: Patients with suspected or known Crohn disease.

Key Factors: The guideline covers three common clinical scenarios: initial evaluation of Crohn disease, evaluation for anticipated exacerbation, and monitoring therapy. It rates the appropriateness of various imaging modalities, including CT enterography, MR enterography, and standard CT and MRI.

ACR Appropriateness Criteria® Acute Nonlocalized Abdominal Pain ⁽⁶⁾

Study Design: This document is part of the American College of Radiology (ACR) Appropriateness Criteria, which are evidence-based guidelines reviewed annually by a multidisciplinary expert panel.

Target Population: Adults with acute nonlocalized abdominal pain.

Key Factors: The guideline provides imaging recommendations for various clinical scenarios, including patients with fever, recent abdominal surgery, or neutropenia. It discusses the use of CT, MRI, ultrasound, and other imaging modalities to evaluate infectious or inflammatory processes, abdominal and pelvic neoplasms, and ischemic or vascular etiologies.

Diagnostic imaging of acute abdominal pain in adults ⁽⁸⁾

Study Design: This document is a review article discussing the diagnostic imaging of acute abdominal pain in adults.

Target Population: Adults presenting with acute abdominal pain.

Key Factors: The article outlines the differential diagnosis based on the location of pain and provides imaging recommendations for various conditions such as abscess, acute pancreatitis, appendicitis, cholecystitis, Crohn disease, diverticulitis, ectopic pregnancy, and more. It emphasizes the use of ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI) for different scenarios.

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽³⁰⁾

Study Design: This document is a clinical practice guideline developed by the American Heart Association (AHA) and American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines.

Target Population: Patients with aortic disease across multiple clinical presentation subsets (asymptomatic, stable symptomatic, and acute aortic syndromes).

Key Factors: The guideline provides recommendations for diagnosis, genetic evaluation, family screening, medical therapy, endovascular and surgical treatment, and long-term surveillance of aortic disease. It emphasizes shared decision-making, institutional interventional volume, and multidisciplinary aortic team expertise.

ANALYSIS OF EVIDENCE

Analysis ^(1,4,6,8,30):

In summary, CT is a valuable imaging modality for diagnosing acute abdominal and pelvic pain, with high diagnostic accuracy and the ability to visualize various pathologies. The use of contrast-enhanced CT further enhances its diagnostic capabilities. However, MRI is recommended in specific scenarios, particularly for young and pregnant patients, due to its lack of ionizing radiation and higher specificity for certain conditions. The choice of imaging modality should be based on the clinical presentation, patient demographics, and the suspected diagnosis.

Shared Findings

- **Diagnostic Value of CT:** All articles emphasize the high diagnostic value of CT in evaluating acute abdominal and pelvic pain. CT is widely recognized for its ability to provide detailed images that help in diagnosing various conditions such as appendicitis, diverticulitis, and ovarian cysts. CT is particularly useful in cases where ultrasound findings are inconclusive or when urinary and gastrointestinal pathology is suspected.
- **Use of Contrast-Enhanced CT:** The use of contrast-enhanced CT is recommended for better visualization of structures and identification of pathologies. It helps in detecting inflammation, abscesses, and vascular issues. Contrast-enhanced CT is preferred for evaluating conditions like pelvic inflammatory disease, ovarian torsion, and renal abscesses.
- **Radiation Concerns:** There is a consensus on the need to minimize radiation exposure, especially in young and pregnant patients. MRI is suggested as an alternative imaging modality in such cases.

POLICY HISTORY

Date	Summary
July 2025	• Added a Summary of Evidence and Analysis of Evidence • Added note of medical necessity under combination studies for

Date	Summary
	known genetic conditions – guideline alignment
June 2025	• This guideline replaces Evolent Clinical Guideline 068 for Abdomen Pelvis CT • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Hematuria, kidney stone and hernia sections revised • Genetic syndromes and cancer imaging updated • Applicable Line of Business adjusted – Medicare checked • Updated language in the preoperative/postoperative section • Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated • Background shortened and integrated into indications • References updated
June 2024	• Combination studies section adjusted to make uniform with all other guidelines • Added Genetic Syndromes and Tumors Section • Added contraindications and preferred studies section • Moved sections/indications throughout for better indications grouping • Updated references and background

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 2004 for Abdomen Magnetic Resonance Imaging (MRI), Magnetic Resonance Cholangiopancreatography (MRCP)

Guideline Number: Evolent_CG_2004	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Abdomen Magnetic Resonance Imaging (MRI) generates images of the organs and structures within the abdomen without the use of ionizing radiation. Abdominal imaging begins at the diaphragm and extends to the umbilicus or iliac crests.

Special Note

A single authorization for CPT codes 74181, 74182, 74183, S8037 covers imaging of the biliary tree and its attached organs, i.e., the liver, gallbladder (GB), and pancreas. These same codes also cover MRI abdomen, Magnetic Resonance Enterography, and Magnetic Resonance Urography. These same codes also cover MRI abdomen, Magnetic Resonance Enterography, and Magnetic Resonance Urography. Multiple authorizations are not typically required. When both Magnetic Resonance Cholangiopancreatography (MRCP) and MRI abdomen are requested, documentation requires a medical reason clearly indicating why both are needed, i.e., that meets guidelines for imaging of bowel, kidneys, or areas other than liver, pancreas, GB, and biliary tree as well.

Note: There is not an Abdomen and Pelvis MRI combo (comparable to a Abdomen and Pelvis CT). If imaging of both the abdomen and pelvis are indicated, two separate exams (and authorizations) are required (i.e., MRI Abdomen and MRI Pelvis).

INDICATIONS

Organ Specific Imaging

Adrenal ⁽¹⁾

- Indeterminate adrenal lesion seen on prior imaging
- For follow up of known adrenal mass when a change in tumor is suspected by either imaging, laboratory evaluation and/or symptoms
- Adrenal mass < 4 cm incidentally discovered with benign characteristics (homogenous, regular borders, HU < 10), one follow-up at 6 months then annually x 2 years (no further imaging if stable) ⁽²⁾
- Adrenal mass ≥ 4 cm and no diagnosis of cancer, can approve for either pre-operative planning **OR** if surgery is not done, can repeat imaging in 6-12 months then as clinically indicated (if there is known malignancy, biopsy is typically the next step rather than surveillance imaging) ⁽²⁾
- See **Endocrine Disorders** for additional indications
- See **Imaging in Known Genetic Conditions** for additional screening indications

Liver

- Indeterminate liver lesion seen on prior imaging ⁽³⁾
- Elevated or rising AFP (in patients at high risk for Hepatocellular Carcinoma (HCC) (known cirrhosis and/or chronic hepatitis B, Asian males Hepatitis B carriers ≥ 40 y, Asian female Hepatitis B carriers ≥ 50 y, Hepatitis B carriers with + family history of HCC and African and/or North American blacks with hepatitis B) ⁽⁴⁾
- Screening in patients at high risk for HCC (see above) every 6 months when prior ultrasound is insufficient to evaluate the liver due to steatosis/fatty liver or nodular liver
 - The finding of steatosis/fatty liver and/or nodular liver alone on an ultrasound report is insufficient for approval; the report must specify that those findings prevent adequate visualization of the liver by ultrasound
 - **NOTE:** Magnetic Resonance Elastography (CPT 76391) for evaluation of hepatic fibrosis is not covered by this guideline; if this CPT code is managed for the health plan by Evolent, see Evolent Clinical Guideline 2038 for Magnetic Resonance Elastography (MRE)
- Jaundice or abnormal liver function tests after equivocal or abnormal ultrasound ⁽⁵⁾
- Follow-up of suspected hepatocellular adenomas every 6-12 months for 2 years, then annually (sooner if change was noted on last imaging study) ^(6,7)
- Surveillance of patients with primary sclerosing cholangitis, every 6-12 months after the age of 20 (MRI and MRCP preferred over CT) ⁽⁸⁾
- Follow-up of focal nodular hyperplasia (FNH), repeat imaging in 6-12 months to ensure stability. Additional imaging beyond that is needed only if atypical features or diagnosis is still in question ⁽⁷⁾
- See **Imaging in Known Genetic Conditions** for additional screening indications

Pancreas

- Pancreatic cystic lesion found on initial imaging, approve for initial characterization of lesion ⁽⁹⁾
- Follow-up for pancreatic cyst (including Intraductal Papillary Mucinous Neoplasm (IPMN)) as below ^(10,11):
 - Incidental and asymptomatic cysts <1.5 cm, **AND**:
 - Age < 65, image annually x 5 years, then every 2 years if stable
 - Age 65-79, imaging every 2 years x 5, then stop if stable
 - Cysts 1.5-1.9 cm with main pancreatic duct communication (MPD), image annually x 5 years, then every 2 years x 2, stop if stable at year 9
 - Cysts 2.0-2.5 cm with MPD communication, image every 6 months x 4, then annually x 2, then every 2 years x 3, stop if stable at year 10
 - Cysts 1.5-2.5 cm with **NO** MPD communication (or cannot be determined), image every 6 mos. x 4, then annually x 2 then every 2 years x 3, stop if stable at year 10
 - Cyst > 2.5 cm on surveillance (i.e., intervention has not been chosen), image every 6 mos. x 4, then annually x 2 years, then every 2 years x 3. Stop if stable at year 10
 - Patients > 80 years of age at presentation are imaged less frequently: image every 2 years x 2, stop if stable at year 4 (intervals are the same regardless of size if surveillance chosen)
 - Growth or suspicious change on a surveillance imaging scan may warrant more frequent surveillance
- Prior to Y90 treatment
- After confirmed diagnosis of exocrine pancreatic insufficiency (EPI), one-time imaging to exclude a secondary cause for EPI. (Imaging is not indicated for workup of suspected pancreatic insufficiency; fecal elastase level < 100 µg/g is consistent with EPI) ⁽¹²⁾
- See **endocrine disorders** for additional indications ⁽⁹⁾
- See **Genetic Syndromes and Rare Diseases** for additional screening indications

Renal

- Indeterminate renal mass on other imaging ⁽¹³⁾
- Active surveillance for solid renal mass(es) at 6 and 12 months, then annually ⁽¹⁴⁾
NOTE: more frequent imaging may be indicated if a change in the mass was seen
- Active surveillance for follow-up of a Bosniak IIF, III and IV complex cystic renal lesion(s) ⁽¹⁵⁾:
 - Every 6 months for the first year then
 - Annually for 5 years if no progression

- If progression or change is seen, then follow-up imaging may be indicated prior to the above intervals.
 - **NOTE:** Bosniak I and II cysts need no further follow-up. (Bosniak I cysts are simple non-enhancing cysts with thin walls, no septa, calcifications or solid components, Bosniak II cysts may contain thin septa, small or fine calcification, minimal enhancement and/or hyperdense and < 3 cm) ⁽¹⁶⁾
- Surveillance of known angiomyolipoma (AML) ^(17–19):
 - Size > 4 cm: Annually
 - Size 3–4 cm: Every 2 years
 - **NOTE:** if < 3 cm monitoring with advanced imaging (CT/MRI) is not needed unless the pt has known Tuberous Sclerosis
 - AML (any size) in an individual with known tuberous sclerosis (TSC): Annually (including at diagnosis) ^(14,17)
 - Post-embolization imaging for AML:
 - One study within the first 6 months, then
 - At one-year post-embolization
 - If stable, further imaging reverts to the above imaging frequency for monitoring (based on size and/or presence of known TSC) ^(20,21)
- Further evaluation of the urinary tract (i.e. MR urography with Pelvis MRI) after indeterminate ultrasound and CT is contraindicated or cannot be performed
- See **Genetic Syndromes and Rare Diseases** for additional indications

Spleen

- Incidental findings of the spleen that are indeterminate on ultrasound or CT imaging ^(22,23)
- See **Imaging in Known Genetic Conditions** for additional indications

Endocrine Disorders ⁽²⁾

- For further evaluation of suspected adrenal tumors and/or endocrine disorders when there is clinical and laboratory evidence to suggest an abdominal source ⁽²⁴⁾
 - Suspected adrenocortical carcinoma
 - Elevated adrenal androgens (DHEA-S, androstenedione, testosterone, 17-hydroxyprogesterone)
 - Cushing's Syndrome:
 - ACTH < 5 following dexamethasone suppression
 - ACTH 5–20 (i.e. indeterminate) with CRH/desmopressin stimulation test and ACTH < 5 (post-stimulation)
 - Hyperaldosteronism: Aldosterone > 20 (or Aldosterone: Renin ratio > 20) and Low

Plasma Renin Activity

- Gastrinoma: Elevated serum gastrin
- GI Carcinoid: Elevated 24-hour urine 5-HIAA or elevated plasma 5-HIAA
- Glucagonoma: Elevated serum glucagon
- Hypoglycemia: One of the following:
 - Elevated serum insulin, pro-insulin and c-peptide ALL drawn during a period of hypoglycemia (72 hour fast) (i.e. concern for insulinoma)
 - Low serum insulin, low C-peptide and/or elevated IGF-2:IGF-1 ratio
- Hypercalcemia: Elevated serum calcium, low-normal PTH, high PTHrP **AND** bone imaging (bone scan) does not reveal a source
- Insulinoma: Elevated serum insulin, pro-insulin and c-peptide **ALL** drawn during a period of hypoglycemia (72 hour fast)
- Pheochromocytoma/Paraganglioma: Elevated plasma or urine metanephrines and/or normetanephrines
- PPoma: Elevated serum pancreatic polypeptide
- Somatostatinoma: Elevated serum somatostatin
- VIPoma: Elevated serum VIP

Inflammatory Bowel Disease (25,26)

- For evaluation of Inflammatory Bowel Disease (IBD) such as Crohn's or Ulcerative Colitis (includes MR Enterography)
 - For suspected inflammatory bowel disease after complete work up including physical exam, labs, and recent colonoscopy
 - Known inflammatory bowel disease with recurrence or worsening signs/symptoms requiring re-evaluation or for monitoring therapy

Evaluation of Infection and Inflammation (27,28)

Fistula

- For history of fistula in the abdomen that requires re-evaluation or is suspected to have recurred

Infection and Inflammation (29,30)

When CT is contraindicated or cannot be performed:

- Any known infection that is clinically suspected to have created an abscess in the abdomen
- Abnormal fluid collection limited to the abdomen seen on prior imaging that needs follow-

up evaluation

- Suspected peritonitis when abdominal pain and tenderness to palpation are present, and at **LEAST** one of the following:
 - Rebound, guarding or rigid abdomen
 - Severe tenderness to palpation over the entire abdomen
- Complications of diverticulitis (diagnosed either clinically or by imaging) with severe abdominal pain or severe tenderness or mass, not responding to antibiotic treatment)

Hernia ⁽³¹⁾:

- Suspected hernia and CT is inconclusive, contraindicated or cannot be performed:
 - Occult, incisional, recurrent or epigastric hernia when physical exam **AND** prior ultrasound is non-diagnostic or equivocal
- Known or suspected hernia with suspected complications based on one or more of the following:
 - Symptoms such as severe pain, vomiting, diarrhea or blood in stool
 - Exam findings such as inability to reduce hernia, severe tenderness, guarding, rebound
 - Complication is suggested on prior imaging ⁽³²⁾
- Known abdominal hernia, imaging is needed for surgical planning and clinical reason MRI is being requested rather than CT

Other Indications ⁽³³⁾

For any of the following:

- To locate a pheochromocytoma once there is clear biochemical evidence ⁽³⁴⁾
- Prior to liver transplantation; may repeat studies immediately prior to transplantation with known HCC, primary sclerosing cholangitis (PSC), or cholangiocarcinoma
- Prior to solid organ transplantation
- Suspected pelvic congestion syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminate (no contraindication to CT is needed) ⁽³⁵⁾

For any of the following:

When CT is contraindicated or cannot be performed:

- Persistent abdominal/pelvic pain not explained by previous imaging (i.e. ultrasound or scope) and laboratory evaluation
- Acute abdominal pain and age > 65
- For fever of unknown origin (temperature of ≥ 101 degrees for a minimum of 3 weeks)

after **ALL** of the following have been completed and a source is not identified: complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, serologic testing (EBV, EMV, HIV and hepatitis), tuberculin test. ⁽³⁶⁾

- Any B-symptoms of fevers more than 101° F, drenching night sweats, or unexplained weight loss of more than 10% of body weight over 6 months with documented concern for lymphoma/malignancy ⁽³⁷⁾
- Weight loss, **ONE** of the following:
 - Clinically significant unintentional weight loss i.e., ≥5% of body weight in less than 12 months (or ≥ 2% in one month), with signs or symptoms suggestive of an abdominal cause
 - Ongoing unexplained clinically significant weight loss i.e., ≥5% of body weight in less than 12 months (or ≥ 2% in one month) ⁽³⁸⁾ after initial workup (Chest x-ray, age appropriate cancer screening (such as colonoscopy and mammography) and labs (including CBC, CMP, HbA1C, TSH, stool hemoccult, ESR/CRP, HIV, Hepatitis C)) has been completed, no cause identified, and second visit documenting further decline in weight ⁽³⁹⁾
- Suspected or known retroperitoneal fibrosis after complete workup and ultrasound to determine extent of disease ⁽⁴⁰⁾
- Suspected paraneoplastic syndrome (including dermatomyositis) with high suspicion of abdominal malignancy and appropriate workup has been done
- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US ⁽⁴¹⁾
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause ⁽⁴¹⁾
- Further evaluation of a new onset or non-reducible varicocele ⁽⁴²⁾
- Prior to Bone Marrow Transplant (BMT) ^(43,44)
- Follow-up of abnormal lymph nodes with no prior history of malignancy
 - Follow-up imaging at 3 months ⁽⁴⁵⁾

Indications for MRCP ⁽⁴⁶⁾

- To confirm choledocholithiasis in patients in the acute setting after ultrasound has been completed
- Pancreatitis: see **combination studies** for indications
- Evaluation of suspected congenital anomaly of the pancreaticobiliary tract, e.g., aberrant ducts, pancreas divisum or related complications
- Suspected choledochal cyst after ultrasound has been done
- Long-term postoperative surveillance for patients with history of choledochal cyst

- Post-surgical biliary anatomy and complications when Endoscopic Retrograde Cholangiopancreatography (ERCP) is not possible or contraindicated
- Assessment of benign or malignant biliary strictures
- Evaluation of persistent symptoms when abnormalities are identified on other imaging (e.g., ultrasound, CT, or MRI)
- Evaluation of abnormality related to the pancreatic or biliary tree based on symptoms or laboratory findings and initial imaging has been performed or is contraindicated (e.g., renal failure prevents contrast CT or body habitus limits ultrasonography (US))
- Evaluation of pancreatobiliary disease in pregnant patients after ultrasound has been done
- Prior to liver transplantation, may repeat studies immediately prior to transplantation with known HCC, PSC, or cholangiocarcinoma

Known Malignancy ⁽⁴⁷⁾

Initial Staging or Recurrence

- Abdomen MRI is indicated when there are indeterminate findings on initial staging (such as for suspected liver metastases) imaging in need further evaluation with MRI.
- For the following malignancies, Abdomen MRI is indicated for initial staging:
 - Biliary Tract Cancers ⁽⁴⁸⁾
 - Primary Liver Cancers ⁽⁴⁹⁾
 - Sarcoma in the abdomen (soft tissue or bone) ^(50,51)
 - Uveal Melanoma ⁽⁵²⁾

Restaging

- Abdomen MRI is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the following malignancies:
 - Any malignancy with known or suspected liver metastases ⁽⁵³⁾
 - Biliary Tract Cancers ⁽⁴⁸⁾
 - Primary Liver Cancers ⁽⁴⁹⁾
 - Renal Cell Carcinoma ⁽¹⁴⁾
 - Sarcoma in the abdomen (soft tissue or bone) ^(50,51)
 - Uveal Melanoma ⁽⁵²⁾
- For further evaluation of known liver metastases including prior to liver directed therapy or to assess treatment response
 - **NOTE:** In patients undergoing other imaging (such as PET or CT) for active

malignancies and there are either known liver metastases in need of restaging or indeterminate liver lesions on other imaging, a dedicated liver MRI is considered complimentary **NOT** overlapping and can be approved in addition to PET if the patient otherwise meets criteria for PET approval (see PET Guideline for further guidance).

- MRCP is indicated for restaging during active treatment (every 2-3 cycles of chemo or immunotherapy, following radiation and/or after surgery) for the following:
 - Biliary Tract Cancers (Ampullary Adenocarcinoma, Cholangiocarcinomas and Gallbladder Cancer)

Surveillance

Abdomen MRI is indicated during surveillance for the following malignancies at the intervals defined below:

- Any malignancy with a history of liver metastases: every 3-6 months ⁽⁴⁹⁾
- Hepatocellular Carcinoma every 3-6 months for 2 years then every 6 months indefinitely ⁽⁴⁹⁾
- Melanoma: Uveal every 6-12 months for 10 years then as clinically indicated ⁽⁵²⁾
- Renal Cell Carcinoma ⁽¹⁴⁾:
 - Stage I - 1-3 months after treatment, then at 6 months and 12 months following treatment then annually
 - Stage II and higher - every 3-6 months for 3 years, then annually for 2 years, then as clinically indicated
- When CT is contraindicated or cannot be performed **AND** the medical necessity criteria have been met (see Evolent Clinical Guideline 2000 for Abdomen and Pelvis CT) for that malignancy, Abdomen MRI can be used during surveillance instead of CT

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Follow-up of known or suspected post-operative complication (within 6 months) involving only the abdomen ⁽²⁹⁾
- A follow-up study to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed ⁽²⁹⁾
- Known or suspected complications

- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

Surveillance Screening:

- ADPKD (Autosomal Dominant Polycystic Kidney Disease): annually (including at diagnosis) OR prior to treatment ⁽⁵⁴⁾
- Alpha-1 Anti-Trypsin Deficiency (AATD): every 6 months ⁽⁵⁵⁾
- ATM: Annually starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) ⁽⁵⁶⁾
- BAP1-TPDS (BAP-1 tumor predisposition syndrome) every 2 years starting at age 30 ^(14,57)
- Beckwith-Wiedemann syndrome: when ultrasound is abnormal, or AFP is rising ⁽⁵⁸⁾
- Beta-Thalassemia: annually ⁽⁵⁹⁾
- BHDS (Birt-Hogg-Dube): annually starting at age 20 (or earlier with family history of renal tumors diagnosed before age 30 ^(14,60)
- BRCA2: annually starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) ^(56,61)
- CDKN2A: annually starting at age 40 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier) ⁽⁵⁶⁾
- FAP (Familial Adenomatous Polyposis) annually ⁽⁶²⁾
- Gaucher Disease: annually (including at initial diagnosis) ⁽⁶³⁾
- Hemochromatosis: at diagnosis ⁽⁶⁴⁾

- HLRCC (hereditary leiomyomatosis and renal cell cancer) annually starting at age 8 ^(14,65)
- HPRC (hereditary papillary renal carcinoma): annually starting at age 30 ⁽¹⁴⁾
- Multiple Endocrine Neoplasia type 1 (MEN1): annually starting at age 8 ^(66,67)
- Multiple Endocrine Neoplasia type 2 (MEN2): with abnormal biochemical results suggestive of adrenal tumor ⁽⁶⁸⁾
- Hereditary PGL/PCC Syndromes (including SDHx mutations): every 2 years including at diagnosis ^(14,69)
- PRSS1 (Hereditary Pancreatitis; including PRSS1, SPINK1 and other hereditary pancreatitis genes): annually starting 20 years after onset of pancreatitis, or at age 40 years, whichever is earlier ⁽⁵⁶⁾
- PTEN: every 2 years (including at diagnosis) starting at age 40 (or 10 years younger than the earliest renal cell cancer diagnosis in the family, whichever is earlier) ⁽⁷⁰⁾
- Sickle Cell Disease: annually ⁽⁷¹⁾
- SKT11 (including Peutz-Jeghers): at diagnosis, annually starting at age 8 ^(56,72)
- Tuberous sclerosis: annually (including at diagnosis) ^(14,17)
- Von Hippel-Lindau (VHL): annually (including at diagnosis) starting at age 11 ⁽⁷³⁾
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Screening Based on Known Genetic Syndrome in combination with Family History:

- Known mutation in other pancreatic susceptibility genes (BRCA1, MLH1 (Lynch), MSH2, MSH6, EPCAM, PALB2, TP53 (Li-Fraumeni) **AND** ≥ 1 first- or second-degree relative with history of pancreatic cancer from the same side of the family as the identified variant: Annually starting at age 50 (or 10 years younger than the earliest pancreatic cancer diagnosis in the family, whichever is earlier)

Surveillance Screening Based on Family History

- To Screen for Pancreatic Cancer in patients with no identified mutation listed above **AND** the following family history:
 - ≥ 2 first-degree relatives with a history of pancreatic cancer from the same side of the family: Annually
 - ≥ 3 first- and/or second-degree relatives with a history of pancreatic cancer from the same side of the family: Annually

Combination Studies for known genetic conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen MRI and MR Elastography (MRE)

- Alpha-1 Anti-Trypsin Deficiency (AATD): every 6 months ⁽⁵⁵⁾

Abdomen/Whole Body MRI

- Hereditary PGL/PCC Syndromes (including SDHx mutations): every 2 years (including at diagnosis) ^(14,69)

Brain/Cervical/Thoracic/Lumbar/Abdomen MRI

- Von Hippel Lindau (VHL): annually (including at diagnosis) starting at age 11 ⁽⁷³⁾

Chest CT and Brain/Abdomen/Pelvis MRI

- Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1) ^(66,67):
 - Annually starting at age 8
 - Note: every 3 years include Brain MRI

OTHER COMBINATION STUDIES WITH ABDOMEN MRI

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen MRA and Abdomen MRI

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis)

Sinus/Face/Neck/Chest/Abdomen MRI

- Advanced imaging for Granulomatosis with Polyangiitis (GPA) (Formally Wegener's Granulomatosis) is indicated with any ONE of the following ⁽⁷⁴⁾:
 - Suspected GPA based on clinical findings (such as biopsy results, lab testing including antineutrophil cytoplasmic antibodies (ANCA))
 - Known GPA when imaging results of a specific anatomic area is needed to guide systemic therapy decisions

Abdomen MRI and Abdomen MRA and PET

- Prior to Y90 treatment ⁽⁷⁵⁾

Abdomen MRI and MRCP

- Prior to Y90 treatment ⁽⁷⁵⁾
- Prior to liver transplantation; may repeat studies immediately prior to transplantation with known HCC, primary sclerosing cholangitis (PSC), or cholangiocarcinoma
- Pancreatitis: Suspected and Known ⁽⁴⁶⁾
 - Initial imaging for suspected acute pancreatitis due to epigastric pain with elevated amylase and/or lipase
 - For mild presentation when symptom improvement is not seen after 72 hours of treatment and any ONE of the following:
 - Ultrasound has been performed and did not show an abnormality such as gallstones, dilated bile duct
 - Ultrasound suggests complications (such as fluid collection)
- For severe pancreatitis presentation (such as fever, elevated WBC, jaundice, tachycardia)
- For a decline in clinical status and/or suspected complication (such as infection/abscess, hypovolemia, organ failure, pancreas necrosis)
- History of pancreatitis (including pancreatic pseudocyst) with abdominal pain suspicious for worsening or re-exacerbation
- Known prior necrotizing pancreatitis requiring follow-up ⁽⁴⁶⁾

Abdomen MRI and MR Elastography

- MRI Abdomen can be used for HCC Screening and MR Elastography can be used to stage hepatic fibrosis. When each indication requires an insufficient ultrasound, that ultrasound needs to be insufficient for only one of the two indications to meet medical necessity for both studies.
 - Magnetic Resonance Elastography (CPT 76391) for evaluation of hepatic fibrosis is not covered by this guideline; if this CPT code is managed for the health plan by Evolent, see Evolent Clinical Guideline 2038 for MR Elastography.

Abdomen/Pelvis MRI

- As a dedicated CPT code does not exist for Abdomen and Pelvis MRI (unlike CT), when a disease process is reasonably expected to involve both the abdomen and pelvis AND the guideline criteria have been met, two separate authorizations are required: Abdomen MRI (CPT 74181, 74182, 74183) and Pelvis MRI (CPT 72195, 72196, 72197).

Combination Studies for Malignancy for Initial Staging or Restaging

Unless otherwise specified in this guideline, indication for combination studies for malignancy for initial staging or restaging:

- Concurrent studies to include CT or MRI of any of the following areas as appropriate depending on the cancer: Abdomen, Brain, Chest, Neck, Pelvis, Cervical Spine, Thoracic Spine or Lumbar Spine

CODING AND STANDARDS

Codes

74181, 74182, 74183, S8037, +0698T, +0724T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

Diseases of the Abdomen and Pelvis 2018-2021 ⁽¹⁾

Study Design: This chapter provides an overview of adrenal imaging, focusing on the evaluation and management of adrenal masses in various clinical scenarios.

Target Population: Patients with adrenal masses, including those with known biochemical abnormalities, underlying malignancies, or incidental findings.

Key Factors: The document discusses different imaging techniques to differentiate benign from malignant adrenal masses and provides recommended imaging algorithms for the workup of incidental adrenal masses.

Diagnosis, Staging, and Management of Hepatocellular Carcinoma: 2018 Practice Guidance by the American Association for the Study of Liver Diseases ⁽⁶⁾

Study Design: This practice guidance document provides a data-supported approach to the diagnosis, staging, and treatment of hepatocellular carcinoma (HCC), developed by a panel of experts.

Target Population: Patients diagnosed with HCC.

Key Factors: The document covers various aspects of HCC management, including surveillance, diagnosis, and treatment. It emphasizes the importance of imaging and biopsy in the diagnosis and staging of HCC and provides recommendations for different treatment options based on the stage of the disease.

American gastroenterological association institute guideline on the diagnosis and management of asymptomatic neoplastic pancreatic cysts ⁽¹¹⁾

Study Design: This guideline by the American Gastroenterological Association (AGA) provides recommendations for the management of asymptomatic neoplastic pancreatic cysts.

Target Population: Adult patients with asymptomatic pancreatic cysts identified by radiology.

Key Factors: The guideline emphasizes the importance of identifying cysts with early invasive cancer or high-grade dysplasia. It recommends MRI for surveillance and endoscopic ultrasonography with fine-needle aspiration (EUS-FNA) for cysts with high-risk features.

ACR Appropriateness Criteria® Indeterminate Renal Mass ⁽¹³⁾

Study Design: This document outlines guidelines for the evaluation of indeterminate renal masses, developed by a multidisciplinary expert panel and reviewed annually.

Target Population: Patients with indeterminate renal masses detected incidentally.

Key Factors: The guidelines recommend CT and MRI with intravenous contrast as the mainstays of evaluation. Contrast-enhanced ultrasound is also suggested as an alternative for patients with contraindications to CT or MRI contrast.

ACR Appropriateness Criteria® Hernia ⁽³¹⁾

Study Design: This document provides evidence-based guidelines for the initial imaging of adult patients with suspected abdominopelvic hernias. The guidelines are developed by a multidisciplinary expert panel and are reviewed annually.

Target Population: Adult patients with signs or symptoms prompting suspicion of abdominopelvic hernia.

Key Factors: The document emphasizes the importance of imaging in the diagnosis and management of hernias, recommending CT and ultrasound as first-line modalities. MRI protocols may also be useful, especially in patients with orthopedic instrumentation.

ANALYSIS OF EVIDENCE

Analysis ^(1,6,11,13,31):

In summary, while the articles share common conclusions about the utility and effectiveness of MRI in abdominal imaging, they differ in their specific indications, protocols, and clinical scenarios. Each article provides valuable insights into the role of MRI in diagnosing and managing various abdominal conditions, highlighting its importance in modern medical practice.

Shared Conclusions

- **Utility of MRI:** All articles agree on the utility of MRI in diagnosing and managing various abdominal conditions. MRI is highlighted for its non-invasive nature, lack of ionizing radiation, and high-resolution imaging capabilities.
- **Contrast-Enhanced MRI:** The use of contrast-enhanced MRI is a common theme. It is emphasized for its ability to provide detailed images and enhance the visibility of certain structures and abnormalities.
- **Specificity and Sensitivity:** MRI is noted for its high specificity and sensitivity in detecting and characterizing lesions, whether they are renal masses, hepatic tumors, or adrenal abnormalities.

POLICY HISTORY

Date	Summary
July 2025	● Added a Summary of Evidence and Analysis of Evidence ● Removed, “One of the following” from Suspected adrenocortical carcinoma in the Endocrine Disorders
June 2025	● This guideline replaces Evolent Clinical Guideline 031 for Abdomen MRI, MRCP, MRE, and MRU ● Added in general information statement regarding guideline

Date	Summary
	criteria development by reputable sources, standard of care, and best practices ● Hernia section reorganized and revised ● Genetic and cancer sections updated ● Updated language in the preoperative/postoperative section ● Segment added to combinations studies about if the required use of conscious sedation is needed the entire combination is indicated ● Applicable Line of Business adjusted – Medicare checked ● Background shortened and relevant information moved to indications ● References updated
June 2024	● Revised the purpose ● Genetics section and Malignancy was reorganized ● Organ section was reorganized ● Fixed typo in pancreas section for mm to be cm ● Renal Bosniak section was adjusted to incorporate background into this section for further clarification ● Polycystic Kidney Disease was updated ● Known Malignancy section was adjusted to indicate initial staging, restaging, and surveillance to be consistent with new cancer bundles coming out ● Background cut ● Added in post-embolization imaging ● Added CPT code +0722T ● Added Contraindications and Preferred Studies statement to Background ● Adjusted Combination Studies

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

REFERENCES

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Evolent Clinical Guideline 2003 for Abdomen Magnetic Resonance Angiography (MRA)

Guideline Number: Evolent_CG_2003	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic resonance angiography (MRA) and magnetic resonance venography (MRV) generates images of the blood vessels that can be evaluated for evidence of stenosis, occlusion, or aneurysms without use of ionizing radiation. It is used to evaluate the blood vessels of the abdomen.

NOTE: Authorization for MR Angiography covers both arterial and venous imaging. The term *angiography* refers to both arteriography and venography.

INDICATIONS FOR ABDOMEN MRA

Abdominal Aortic Disease

Abdominal Aortic Aneurysm

- Suspected or known **asymptomatic** abdominal aortic aneurysm (AAA) with **ALL** of the following:
 - Prior ultrasound is inconclusive or insufficient
 - A reason MRA is needed rather than computed tomography (CT) has been provided, (e.g., complex vascular anatomy or suspected complications)
 - The study is ordered at the appropriate AAA surveillance interval ⁽¹⁾:
 - Aneurysm size 2.5-3 cm, every 10 years
 - Aneurysm size 3.0-3.9 cm, every 3 years
 - Aneurysm size 4.0-4.9 cm, annually

- Aneurysm size 5.0-5.4 cm, every 6 months
- Known or suspected **symptomatic** AAA when ^(1,2)
 - Symptoms may include:
 - Abrupt onset of severe sharp or stabbing pain in the chest, back or abdomen (could indicate possible aneurysm rupture)
 - Acute abdominal or back pain with a pulsatile or epigastric mass
 - Acute abdominal or back pain and at high risk for aortic aneurysm and/or aortic syndrome (risk factors include hypertension, atherosclerosis, prior cardiac or aortic surgery, underlying aneurysm, connective tissue disorder (e.g., Marfan syndrome, vascular form of Ehlers-Danlos syndrome, Loeys-Dietz syndrome), and bicuspid aortic valve) ⁽³⁾

Aortic Syndromes

For initial diagnosis of suspected aortic syndromes and follow-up of known aortic syndromes, (e.g., aortic dissection, intramural hematoma and penetrating atherosclerotic ulcer):

- Frequency for follow up is as clinically indicated

Postoperative Follow-up of Aortic Repair ^(1,2)

Follow-up for post-endovascular repair (EVAR) or open repair of AAA or abdominal extent of iliac artery aneurysms at the following intervals (CT preferred for routine follow-up):

- Routine, baseline post-EVAR study when a reason MRA rather than CT is needed has been provided (such as complex anatomy or suspected complications) with any **ONE** of the following:
 - Within one month of procedure
 - Continued follow up imaging at the following intervals:
 - If no endoleak or sac enlargement is seen:
 - Annually with past inconclusive or insufficient ultrasound
 - Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval)
 - If type II endoleak or sac enlargement is seen at any point in time:
 - Every 6 months x 2 years, then annually (does not require prior ultrasound)
- Routine follow up after open repair of AAA when a reason MRA is needed rather than CT has been provided (e.g., complex vascular anatomy or suspected complications with any **ONE** of the following:
 - Within 1 year postoperatively then
 - Annually with past inconclusive or insufficient ultrasound
- Every 5 years (inconclusive or insufficient ultrasound not required at the 5-year interval) if symptomatic or imaging shows increasing or new findings related to stent graft – more

frequent imaging may be needed as clinically indicated

- Suspected complication (such as, new onset lower extremity claudication, ischemia, or reduction in ankle brachial index (ABI) after aneurysm repair
- Evaluation of endovascular/interventional abdominal vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Evaluation of post-operative complications, e.g., pseudoaneurysms, related to surgical bypass grafts, vascular stents, and stent-grafts in the peritoneal cavity

Renal Artery Stenosis

In a patient with hypertension use **AND** prior abnormal or inconclusive ultrasound **AND** any one of the following ^(4,5)

- Onset of hypertension prior to the age of 30 without a family history of hypertension and when there is suspicion of fibromuscular dysplasia or a vasculitis
- Failure to obtain adequate blood pressure control on 3 antihypertensive medications, including one diuretic
- Recurrent episodes of sudden onset of congestive heart failure (also known as cardiac disturbance syndrome; may have normal left ventricular function)
- Renal failure of uncertain cause with normal urinary sediment and < 1g of urinary protein per day
- Coexisting diffuse atherosclerotic vascular disease, especially in heavy smokers
- Acute elevation of creatinine after initiation of an angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB)
- Malignant or difficult to control hypertension and unilateral small kidney size (noted on prior imaging)
- New onset of difficult to control or labile hypertension after age 55
- Abdominal bruit lateralizing to one side of the abdomen
- Diagnosis of a syndrome with a higher risk of vascular disease, such as neurofibromatosis ⁽⁶⁾ and Williams' syndrome ⁽⁷⁾

Ischemia or Hemorrhage

- To determine the vascular source of retroperitoneal hematoma or hemorrhage when CT is insufficient to determine the source and CTA is **contraindicated or cannot be performed** (CT rather than MRA/CTA is the modality of choice for diagnosis) hemorrhage) ⁽⁸⁾
- Evaluation of known or suspected mesenteric ischemia/ischemic colitis when CTA is **contraindicated or cannot be performed** ⁽⁹⁾

Other Vascular Abnormalities of the Abdomen

- Initial evaluation of inconclusive vascular findings on prior imaging
- For evaluation or monitoring of non-aortic large vessel or visceral vascular disease of the abdomen (e.g., aneurysm, dissection, arteriovenous malformations (AVM), vascular fistula, intramural hematoma, compression syndromes and vasculitis involving any of the following: inferior vena cava, superior/inferior mesenteric, celiac, hepatic, splenic or renal arteries/veins), and the findings are reasonably expected to be limited to the abdomen. ⁽¹⁰⁾ For assessment in patients with spontaneous coronary artery dissection (SCAD), can be done at time of coronary angiography ^(11,12)
- Suspected complications of known aneurysm of the abdomen as evidenced by clinical findings such as new onset of abdominal pain (prior ultrasound is **NOT** required)
- For patients with fibromuscular dysplasia (FMD) ^(13,14):
 - One-time vascular study from brain to pelvis
- Takayasu's Arteritis ⁽¹⁵⁾:
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

Venous Disease

- Suspected venous thrombosis (including renal vein thrombosis and/or portal venous thrombosis) if previous studies (such as ultrasound) have not resulted in a clear diagnosis ^(16,17)
- Suspected pelvic congestion syndrome (including May-Thurner and nutcracker syndromes) when ultrasound is indeterminant with (no contraindication to CT is needed) ⁽¹⁸⁾
- Evaluation of suspected pelvic vascular disease or pelvic congestive syndrome when Abdomen MR angiography is ordered in addition to Pelvis MRA with prior inconclusive ultrasound ⁽¹⁸⁾
- For acute unilateral (or asymmetric) lower extremity edema with negative or inconclusive doppler US and CT ⁽¹⁹⁾
- For chronic (greater than 3 months) unilateral (or asymmetric) lower extremity edema and suspicion of malignant cause when Abdomen and Pelvis CT (or Pelvis CT) is negative or inconclusive ⁽¹⁹⁾

Peripheral Vascular Disease ^(20–22)

Note: There is no single CPT code for MRA of the abdomen and pelvis with bilateral lower extremity runoff as there is for CTA (CPT Code 75635). Therefore, when CTA is contraindicated or cannot be performed an analogous MR angiography study is Abdomen MRA (CPT 74185) and one Lower Extremity MRA (CPT 73725). This will provide imaging of the

abdomen, pelvis and both legs. A separate Pelvis MRA authorization is **NOT** required. Only **ONE** Lower Extremity MR Angiography authorization is required (not two).

For evaluation of known or suspected lower extremity vascular disease when CTA is contraindicated or cannot be performed **AND** Abdomen MR Angiography is ordered in addition to lower extremity MR Angiography:

- For known or suspected atherosclerotic peripheral vascular disease-when any **ONE** of the following non-invasive studies are abnormal or indeterminate:
 - Ankle brachial index (< 0.9 is the cutoff for diagnosis of peripheral arterial disease and >1.4 is considered inconclusive)
 - Toe brachial index (< 0.7 is the cutoff for diagnosis of peripheral arterial disease)
 - Segmental pressure test (a pressure gradient > 20 mmHg is considered abnormal)
 - Doppler ultrasound
 - Treadmill test
 - 6-minute walking test
- For acute critical limb ischemia with any **ONE** of the below clinical signs of peripheral vascular disease ^(1,2):
 - Ischemic rest pain
 - Tissue loss
 - Gangrene

NOTE: Prior ultrasound is **NOT** needed

- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following:
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate non-invasive testing or imaging (e.g., ankle brachial index (ABI), ultrasound)

Evaluation of Tumor

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis) ^(17,23)
- Prior to Y90 treatment ⁽²⁴⁾
- For imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery ⁽²⁵⁾

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation:

- Prior to the following procedures:
 - Solid organ transplantation
 - UPJ (ureteropelvic junction) obstruction surgery
 - Imaging of the deep inferior epigastric arteries prior to breast reconstructive surgery ⁽²⁵⁾
 - Transcatheter Aortic Valve Replacement (TAVR) when CTA is **contraindicated or cannot be performed** ⁽²⁶⁾
 - Y90 treatment ⁽²⁴⁾
 - Endovascular aneurysm repair (EVAR) ⁽²⁷⁾
- Trans jugular intrahepatic portosystemic shunt (TIPS) ⁽²⁸⁾
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation:

- Evaluation of post-operative complications, (e.g., pseudoaneurysms), following interventional vascular procedures (e.g., surgical bypass grafts, vascular stents, trans jugular intrahepatic portosystemic shunt (TIPS), and IVC filters)
- Known or suspected complications
- A clinical reason is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

IMAGING IN KNOWN GENETIC SYNDROMES

- Vascular Ehlers-Danlos syndrome (vEDS) ⁽²⁹⁾:
 - Every 18 months (including at diagnosis) **OR**
 - As clinically indicated to follow known vascular abnormalities
- Marfan syndrome ⁽³⁰⁾:
 - Every 3 years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)
- Loeys-Dietz ⁽³¹⁾:
 - Every two years (including at diagnosis)
 - More frequently if abnormalities are found
- Williams Syndrome ⁽⁷⁾:
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- Neurofibromatosis Type 1 (NF-1) ⁽⁶⁾:
 - Development of hypertension (including concern for renal artery stenosis)
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Vascular Ehlers-Danlos syndrome: At diagnosis and then every 18 months; more frequently if abnormalities are found ⁽²⁹⁾
- Loeys-Dietz: at diagnosis and then every two years, more frequently if abnormalities are found ⁽³¹⁾

Chest/Abdomen/Pelvis MRA

- Marfan syndrome ⁽³⁰⁾:
 - Every three years (including at diagnosis)
 - More frequently (annually) if **EITHER**: history of dissection, dilation of aorta beyond aortic root **OR** aortic root/ascending aorta are not adequately visualized on TTE (i.e. advanced imaging is needed to monitor the thoracic aorta)

- Williams Syndrome ⁽⁷⁾
 - Abnormal vascular exam or imaging findings (such as diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)

OTHER COMBINATION STUDIES WITH ABDOMEN MRA

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdomen MRA and Abdomen MRI or CT

- When needed for clarification of vascular involvement from tumor (including suspected renal vein thrombosis)

Chest/Abdomen/Pelvis /Lower Extremity MRA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease.

NOTE: Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli

Abdomen MRI/Abdomen MRA and PET

- Prior to Y90 treatment ⁽²⁴⁾

Abdomen/Pelvis MRA

- As a dedicated CPT code does not exist for Abdomen and Pelvis MRA, when a disease process is reasonably expected to involve both the abdomen and pelvis **AND** the guideline criteria have been met, two separate authorizations are required: Abdomen MRA (CPT code 74185) and Pelvis MRA (CPT 72198)

Brain/Neck/Chest/Abdomen/Pelvis MRA

- For patients with fibromuscular dysplasia (FMD), a one-time vascular study from brain to pelvis ^(13,14)
- For assessment in patients with spontaneous coronary artery dissection (SCAD) ⁽¹¹⁾

NOTE: Body vascular imaging for SCAD can be performed at the time of coronary angiography

Chest/Abdomen/Pelvis MRA

- Evaluation prior to endovascular aneurysm repair (EVAR) when thoracic involvement is present when CTA is contraindicated and cannot be performed

- Evaluation prior to Transcatheter Aortic Valve Replacement (TAVR) when CTA is contraindicated or cannot be performed ⁽²⁶⁾
- Acute aortic dissection ⁽³²⁾
- Significant post-traumatic or post-procedural vascular complications reasonably expected to involve the chest, abdomen and pelvis

Brain/Neck/Chest/Abdomen/Pelvis MRA

- Takayasu's Arteritis: ⁽¹⁵⁾
 - At initial diagnosis
 - Every 6 months for the first 2 years while on therapy
 - Annually after the first 2 years

CODING AND STANDARDS

Codes

74185

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient

exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

2022 ACC/AHA Guideline for the Diagnosis and Management of Aortic Disease: A Report of the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines ⁽¹⁾

Study Design: This document is a clinical practice guideline developed by the American College of Cardiology (ACC) and the American Heart Association (AHA) for the diagnosis and management of aortic disease.

Target Population: Patients with aortic disease, including those with aortic aneurysms, aortic dissection, and other aortic pathologies.

Key Factors: The guideline provides recommendations for the diagnosis, genetic evaluation, medical therapy, endovascular and surgical treatment, and long-term surveillance of patients with aortic disease. It emphasizes the importance of shared decision-making, multidisciplinary aortic teams, and institutional expertise in the management of these patients.

ACR–SIR Practice Parameter for the Performance of Angiography, Angioplasty, and Stenting for the Diagnosis and Treatment of Renal Artery Stenosis in Adults ⁽⁴⁾

Study Design: This document is a practice parameter and technical standard developed collaboratively by the American College of Radiology (ACR) and the Society of Interventional Radiology (SIR). It reviews the literature and provides guidelines for the performance of angiography, angioplasty, and stenting for the diagnosis and treatment of renal artery stenosis (RAS) in adults.

Target Population: Adults with hypertension (HTN) and renal artery stenosis (RAS), including those with renovascular hypertension (RVH) and chronic renal insufficiency (CRI).

Key Factors: The document discusses the indications for renal vascular imaging or angiography, the clinical features suggestive of RVH, the role of laboratory tests and noninvasive imaging, and the criteria for determining the success of endovascular interventions. It also addresses the training and credentialing of practitioners performing these procedures.

Society for Vascular Surgery practice guidelines for atherosclerotic occlusive disease of the lower extremities: Management of asymptomatic disease and claudication ⁽²²⁾

Study Design: This document is a set of practice guidelines developed by the Society for Vascular Surgery (SVS) for the management of atherosclerotic occlusive disease of the lower extremities, focusing on asymptomatic disease and claudication.

Target Population: Patients with peripheral arterial disease (PAD), including those with asymptomatic disease and intermittent claudication (IC).

Key Factors: The guidelines emphasize risk factor modification, medical therapies, and the use of exercise programs to improve cardiovascular health and functional performance. They also

discuss the role of revascularization for IC, including endovascular and surgical interventions, and the importance of patient selection and individualized treatment plans.

ANALYSIS OF EVIDENCE

Analysis ^(1,4,22):

While all three articles recognize the value of MRA in diagnosing and managing vascular diseases, they differ in their specific applications and technical considerations. "ACR-SIR RAS 2021" focuses on renal artery stenosis, "Conte 2015" emphasizes peripheral arterial disease, and "Isselbacher et al 2022" provides comprehensive guidelines for aortic disease. Despite these differences, the shared findings underscore the importance of MRA as a non-invasive, effective imaging tool in clinical practice.

Shared Findings:

- All three articles emphasize the significance of imaging techniques in diagnosing and managing vascular diseases. They highlight the role of MRA (Magnetic Resonance Angiography) in providing detailed images of vascular structures, which is crucial for accurate diagnosis and treatment planning.
- The articles agree on the utility of MRA in evaluating aortic diseases, including aneurysms and dissections. MRA is considered a valuable tool for assessing the extent and severity of these conditions, aiding in the decision-making process for surgical or endovascular interventions.
- MRA is recognized for its non-invasive nature, making it a preferred choice for patients who cannot tolerate invasive procedures. This aspect is highlighted across all three articles, emphasizing its safety and effectiveness in clinical practice.

POLICY HISTORY

Date	Summary
July 2025	• Guideline name adjusted to spell out MRA • Added a Summary of Evidence and Analysis of Evidence • Moved Further evaluation section to below Preoperative
June 2025	• This guideline replaces Evolent Clinical Guideline 034-2 for Abdomen MRA/MRV (Angiography) • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Moved AAA screening intervals from background to AAA indications section

Date	Summary
	• Added FMD and Takayasu's arteritis to Other Vascular Abnormalities section including surveillance • Adjusted the language in the Venous Disease section for pelvic congestion syndrome to include nutcracker syndrome and no contraindications to CT • Added language in the Venous Disease section for acute and chronic unilateral lower extremity edema • Adjusted PVD section to include listing of non-invasive studies • Updated language in the preoperative/postoperative section • Genetics section surveillance language adjusted in vEDS, Marfan Syndrome, and Loey's Dietz Syndrome sections • Added Combinations Studies for Known Genetic Diseases section • Segment added to both combinations' sections about if the required use of conscious sedation is needed the entire combination is indicated • Brain added to the Neck/Chest/Abdomen/Pelvis MRA combo with surveillance added to Takayasu's arteritis within the section • Applicable Line of Business adjusted – Medicare checked • Background reduced
June 2024	• Separated out aortic syndromes to be more clear • EVAR studies clarified order of which studies would be ordered • Renal artery stenosis: updated per new clinical guidance • Added Genetic Syndromes and Tumors Section • Added PVD section • Statement put in all Guidelines for contraindications put in indications and background sections • Combo section adjusted and made uniform • Updated references and background sections

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evotent Clinical Guideline 2022 for Computed Tomography (CT) (Virtual) Colonoscopy - Diagnostic

Guideline Number: Evotent_CG_2022	<u>Applicable Codes</u>	
<i>“Evotent” refers to Evotent Health LLC and Evotent Specialty Services, Inc.</i> <i>© 2007 - 2026 Evotent. All rights Reserved.</i>		
Original Date: July 2007	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomographic colonography (CTC), also referred to as virtual colonoscopy, is a minimally invasive structural examination of the colon and rectum to evaluate for colorectal polyps or neoplasms.

See Legislative Language for specific mandates for the State of Rhode Island.

INDICATIONS ^(1,2)

For diagnostic evaluation

Symptomatic patients when conventional colonoscopy is contraindicated or could not be completed and ONE of the following:

- Patient had failed or incomplete colonoscopy ⁽¹⁾
- Patient has an obstructive colorectal cancer
- When colonoscopy is medically contraindicated or not possible (e.g., patient is unable to undergo sedation or has medical conditions such as a recent myocardial infarction, recent colonic surgery, a bleeding disorder, or severe lung and/or heart disease) ⁽¹⁾

Follow-Up Studies

- For a 3-year follow-up when 1-2 polyps that are 6-9 mm in diameter detected at CTC if patient does not undergo polypectomy (or is unwilling or unable to undergo colonoscopy) ⁽²⁾

NOTE: CT (Virtual) Colonoscopy is not indicated in routine follow-up of inflammatory bowel disease, hereditary polyposis or non-polyposis cancer syndromes, evaluation of anal disease, or the pregnant or potentially pregnant patient. ⁽¹⁾

LEGISLATIVE REQUIREMENTS

State of Rhode Island

R.I. Gen. Laws § 27-18-58 ⁽³⁾

Applicable to Commercial, Exchange, Medicare and Medicaid lines of business

§ 27-18-58. Prostate and colorectal examinations — Coverage mandated — The Maryellen Goodwin Colorectal Cancer Screening Act.

(a) Every accident and sickness insurance policy, medical expense insurance policy or medical services plan contract delivered, issued for delivery, or renewed in this state shall provide coverage for prostate and colorectal preventive screening examinations and laboratory tests for cancer for any nonsymptomatic person covered under that policy or contract. The coverage required by this section shall include preventive colorectal cancer screening coverage for all colorectal cancer examinations and laboratory tests in accordance with **American Cancer Society guidelines**, including for colorectal cancer screening of average risk individuals, including an initial colonoscopy or other medical test or procedure for colorectal cancer screening and a follow-up colonoscopy if the results of the initial medical test or procedure are abnormal. Provided, this section does not apply to insurance coverage providing benefits for: (1) Hospital confinement indemnity; (2) Disability income; (3) Accident only; (4) Long-term care; (5) Medicare supplement; (6) Limited benefit health; (7) Specific disease indemnity; (8) Sickness or bodily injury or death by accident, or both; and (9) Other limited benefit policies.

(b) An insurer may not impose cost sharing on the coverage required by subsection (a) of this section when the services are delivered within the health insurer's provider network.

History of Section.

P.L. 2000, ch. 125, § 1; P.L. 2000, ch. 345, § 1; P.L. 2002, ch. 292, § 33; P.L. 2021, ch. 7, § 2, effective April 29, 2021; P.L. 2021, ch. 8, § 2, effective April 29, 2021.

CODING AND STANDARDS

Codes

74261, 74262, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial

☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

SUMMARY OF EVIDENCE

ACR-SABI SAR Practice Parameter for the Performance of Computed Tomography (CT) Colonography in Adults ⁽¹⁾

Study Design: This document outlines the practice parameters for the performance of CT colonography in adults. It includes guidelines for screening, surveillance, and diagnostic examinations.

Target Population: The target population includes adults at average or moderate risk for developing colorectal carcinoma. This includes individuals with a preceding positive stool-based test or positive family history.

Key Factors:

Indications: CT colonography is indicated for screening individuals at average or moderate risk, surveillance of patients with a history of colonic neoplasm, and diagnostic examination in symptomatic patients.

Contraindications: Conditions requiring caution include symptomatic acute colitis, recent colorectal surgery, and known or suspected colonic perforation.

Preparation: Colon preparation involves a combination of cleansing laxatives, tagging agents, and iodinated contrast material.

Technique: The examination technique includes mechanical insufflation using carbon dioxide, imaging in multiple positions, and use of low-dose, non-enhanced CT techniques.

Quality Control: Quality control measures include ensuring complete anatomic coverage of the colon and rectum, adequate colon cleansing and distention, and tracking radiation dose.

NCCN Clinical Practice Guidelines for Colorectal Cancer Screening V1.2024 ⁽²⁾

Study Design

The document outlines the practice parameters for the performance of CT colonography in adults. It includes guidelines for screening, surveillance, and diagnostic examinations.

Target Population

The target population includes adults at average or moderate risk for developing colorectal carcinoma. This includes individuals with a preceding positive stool-based test or positive family history.

Key Factors

Indications: CT colonography is indicated for screening individuals at average or moderate risk, surveillance of patients with a history of colonic neoplasm, and diagnostic examination in symptomatic patients.

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Preparation: Colon preparation involves a combination of cleansing laxatives, tagging agents, and iodinated contrast material.

Technique: The examination technique includes mechanical insufflation using carbon dioxide, imaging in multiple positions, and use of low-dose, non-enhanced CT techniques.

Quality Control: Quality control measures include ensuring complete anatomic coverage of the colon and rectum, adequate colon cleansing and distention, and tracking radiation dose.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,2)

Both documents emphasize the importance of CT colonography in colorectal cancer screening, particularly for individuals at average or moderate risk. They agree that CT colonography is a valuable tool for detecting colorectal neoplasia and improving patient outcomes.

POLICY HISTORY

Date	Summary
June 2025	• This guideline replaces Evolent Clinical Guideline 033-1 for CT (Virtual) Colonoscopy – Diagnostic • Removed irrelevant citations • Updated Follow-Up Indications per NCCN guidance • Added third bullet to General Information • Added Summary of Evidence and Analysis of Evidence • Added legislative language for Rhode Island
May 2024	• Moved follow-up information to Follow-Up Studies section

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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2. Referenced with permission from the National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Colorectal Cancer Screening Version 1.2024 © National Comprehensive Cancer Network, Inc. 2025. All rights reserved. To view the most recent and complete version of the guideline, go online to NCCN.org.
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<https://law.justia.com/codes/rhode-island/title-27/chapter-27-18/section-27-18-58/>

Evolent Clinical Guideline 7272 for Coronary Artery Calcium Scoring by Electron Beam Computed Tomography (EBCT) or Non-Contrast Coronary Computed Tomography (CCT)

Guideline Number: Evolent_CG_7272	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

This guideline includes clinical criteria for coronary artery calcium (CAC) scoring, by either EBCT or non-contrast CCT. CAC testing provides a quantitative assessment of coronary artery calcium content in Agatston units, as an adjunct to the estimation of global risk (see **Background**) for coronary or cardiovascular events over the next 10 years. A CAC Score > 0 is a highly specific feature of coronary atherosclerosis. ^(1,2)

Special Note

See Legislative Language for specific mandates in: **State of New Mexico**, **State of Texas**, and **State of Washington**.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ⁽³⁻⁷⁾

INDICATIONS FOR CORONARY ARTERY CALCIUM (CAC) TESTING

CAC testing is for cardiovascular risk assessment in individuals aged 40-75 years who have an intermediate (5-19.9%) 10-year ASCVD risk based upon the ACC/AHA pooled cohort risk calculator. Documentation is required that the results of the study will affect decision making for preventative actions (i.e., statin therapy).

Patients, regardless of age, can be considered for CAC testing when there is well-documented evidence of one of the following ⁽⁸⁻¹²⁾:

- For asymptomatic patients, without known coronary disease, at intermediate global risk (7.5%-19.9%) **(AUC 8)** ⁽¹²⁾
- For asymptomatic patients, without known coronary disease, at borderline global risk (5%-7.5%), with or without risk-enhancing factors **(AUC 7)** ⁽¹²⁾
 - Atherosclerotic cardiovascular disease (ASCVD) risk enhancing factors include any of the following ^(1,8,10,12-15):
 - Family history of premature ASCVD (male age <55 years, female age < 65 years)
 - Primary hypercholesterolemia (LDL-C > 160 mg/dl or non-HDL-C > 190 mg/dl)
 - Chronic kidney disease
 - Metabolic syndrome
 - Conditions specific to women (e.g., pre-eclampsia, premature menopause) ⁽¹²⁾
 - Inflammatory diseases (HIV, psoriasis, rheumatoid arthritis (RA))
 - Noncoronary vascular disease (e.g. ABI < 0.9)
 - Ethnicity (e.g., South Asian ancestry)
 - Persistently elevated triglycerides (> 175 mg/dl)
 - hsCRP > 2 mg/L
 - Lp(a) levels > 50 mg/dl
 - apoB > 130 mg/dl
- For asymptomatic patients, without known coronary disease, where there is a need for alternative lipid-lowering strategies when statin therapy is contraindicated, due to adverse effects or patient reluctance ⁽¹⁴⁾
- CAC testing may be repeated indefinitely for re-assessment of the asymptomatic patient without known coronary disease after a minimum of 5 years until the calcium score breaches 400 or up to twice if the calcium score remains zero.
- Aortic valve calcium scoring to further define stenosis severity in suspected low-flow, low-gradient severe aortic stenosis (AS) with normal or reduced left ventricular ejection fraction (LVEF) ⁽¹⁶⁾

LEGISLATIVE LANGUAGE

State of New Mexico

59A-23-7.16 ⁽¹⁷⁾

Applicable to: Commercial and Medicaid

Be it enacted by the legislature of the state of New Mexico:

Section 1. A new section of the Health Care Purchasing Act is enacted to read:

"[New Material] Heart Artery Calcium Scan Coverage.--

- A group health plan, other than a small group health plan or a blanket health insurance policy or contract that is delivered, issued for delivery or renewed in this state shall provide coverage for eligible insureds to receive a heart artery calcium scan.
- Coverage provided pursuant to this section shall:
 - be limited to the provision of a heart artery calcium scan to an eligible insured to be used as a clinical management tool;
 - be provided every five years if an eligible insured has previously received a heart artery calcium score of zero; and
 - not be required for future heart artery calcium scans if an eligible insured receives a heart artery calcium score greater than zero.
- As used in this section:
 - "eligible insured" means an insured who:
 - is a person between the ages of forty-five and sixty-five; and
 - has an intermediate risk of developing coronary heart disease as determined by a health care provider based upon a score calculated from an evidence-based algorithm widely used in the medical community to assess a person's ten-year cardiovascular disease risk, including a score calculated using a pooled cohort equation;

State of Texas

HB 1290 Sec 1376.003 ⁽¹⁸⁾

Applicable to: Commercial, Market, and Exchange

- A health benefit plan that provides coverage for screening medical procedures must provide the minimum coverage required by this section to each covered individual:
 - who is:
 - a male older than 45 years of age and younger than 76 years of age; or
 - a female older than 55 years of age and younger than 76 years of age; and
 - who:

- is diabetic; or
- has a risk of developing coronary heart disease, based on a score derived using the Framingham Heart Study coronary prediction algorithm, that is intermediate or higher.
- The minimum coverage required to be provided under this section is coverage of up to \$200 for one of the following noninvasive screening tests for atherosclerosis and abnormal artery structure and function every five years, performed by a laboratory that is certified by a national organization recognized by the commissioner by rule for the purposes of this section:
 - computed tomography (CT) scanning measuring coronary artery calcification; or
 - ultrasonography measuring carotid intima-media thickness and plaque.

State of Washington

20091120A ⁽¹⁹⁾

Number and Coverage Topic

20091120A – Coronary Artery Calcium Scoring

HTCC Coverage Determination

Cardiac Artery Calcium Scoring is a **non-covered benefit**.

HTCC Reimbursement Determination

- **Limitations of Coverage**
 - Not Applicable
- **Non-Covered Indicators**
 - Coronary Artery Calcium Scoring

CODING AND STANDARDS

Codes

75571, S8092, +0722T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

General Overview

CAC testing is for cardiovascular risk assessment in individuals aged 40-75 years who have an intermediate (5-19.9%) 10-year ASCVD risk based upon the ACC/AHA pooled cohort risk calculator. Documentation is required that the results of the study will affect decision making for preventative actions (i.e., statin therapy). CAC testing is a cardiovascular risk assessment tool, applicable only to the patient without known cardiovascular disease, for the purpose of primary prevention. It is not for the patient with suspected or known cardiovascular disease, coronary or otherwise, who already requires aggressive risk factor modification. This test is not to be utilized for symptomatic patients in active ischemic evaluation.

CAC score > 100 can also provide support for aspirin therapy and statin therapy. ^(1,15)

Calcium scores are used to help determine the use and dosage of statin therapy in patients with various risks of developing clinically symptomatic atherosclerotic disease. Once symptomatic coronary disease has been established or once the patient is considered high risk, the usefulness of calcium scoring falls away as patients should be on high dose therapy and the results of a calcium score would add no further benefit. If a patient is symptomatic, non-invasive or invasive testing should remain first line.

Global risk of CAD is defined as the probability of an asymptomatic patient without known CAD developing CAD, including myocardial infarction or CAD death, over a given period of time. Risk categories include:

- Low risk (<5%)
- Borderline risk (5% - 7.4%)
- Intermediate risk (7.5% to 19.9%)
- High risk ($\geq$ 20%)

Websites for Global Cardiovascular Risk Calculators* (2,8,9,20,21)

Risk Calculator	Website for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

AUC Score

A reasonable diagnostic or therapeutic procedure care can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁴⁾

- Appropriate Care- Median Score 7-9
- May be Appropriate Care- Median Score 4-6
- Rarely Appropriate Care- Median Score 1-3

Acronyms / Abbreviations

AS: Aortic stenosis

ASCAD: Atherosclerotic coronary artery disease

ASCVD: Atherosclerotic cardiovascular disease

CAC: Coronary artery calcium

CAD: Coronary artery disease

CCT: Cardiac computed tomography

EBCT: Electron beam computed tomography

LVEF: Left ventricular ejection fraction

SUMMARY OF EVIDENCE

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease⁽¹²⁾

Study Design: The study is a report by the American College of Cardiology (ACC) Solution Set Oversight Committee, in collaboration with several other cardiovascular societies. It updates the prior AUC for various cardiovascular imaging modalities, including radionuclide imaging, stress echocardiography, calcium scoring, coronary computed tomography angiography (CCTA), stress cardiac magnetic resonance (CMR), and invasive coronary angiography.

Target Population: The target population includes patients with known or suspected CCD, which encompasses stable ischemic heart disease (SIHD). The clinical scenarios cover both symptomatic and asymptomatic patients, with and without prior testing or revascularization.

Key Factors:

Clinical Scenarios: The document outlines 64 clinical scenarios for the detection and risk assessment of CCD, drawn from common applications and current clinical practice guidelines.

Rating Process: The clinical scenarios were rated by an independent panel using a modified Delphi process. Ratings were categorized as Appropriate (7-9), May Be Appropriate (4-6), or Rarely Appropriate (1-3).

Updates and Changes: Key changes include the removal of preoperative testing scenarios, simplification of clinical scenario tables, and incorporation of new evidence and guidelines.

Assumptions: The study assumes that each test is performed and interpreted by trained professionals, and that patients are receiving optimal standard care.

Advantages and Limitations: The document provides a table outlining the advantages and limitations of various imaging modalities, such as echocardiography, SPECT, PET, CMR, CCTA, and invasive angiography.

2013 ACC/AHA Guideline on the Assessment of Cardiovascular Risk⁽⁸⁾

Study Design: The guideline is based on systematic evidence reviews conducted by expert panels convened by the National Heart, Lung, and Blood Institute (NHLBI). The evidence was reviewed and recommendations were crafted by the ACC/AHA Task Force on Practice Guidelines. The methodology included the development of new pooled cohort equations for the prediction of 10-year risk of atherosclerotic cardiovascular disease (ASCVD) events.

Target Population: The target population for the guideline includes non-Hispanic African-American and non-Hispanic white men and women aged 40 to 79 years who are free from ASCVD at the beginning of the period. The guideline also provides recommendations for other populations, including Hispanic-American and Asian-American populations, although specific risk algorithms for these groups are not yet developed.

Key Factors

Risk Assessment: The guideline emphasizes the importance of assessing traditional ASCVD risk factors every 4 to 6 years in adults aged 20 to 79 years who are free from ASCVD. It also recommends estimating 10-year ASCVD risk every 4 to 6 years in adults aged 40 to 79 years.

Pooled Cohort Equations: The guideline introduces race- and sex-specific pooled cohort equations to predict the 10-year risk of a first hard ASCVD event. These equations include variables such as age, total cholesterol, high-density lipoprotein cholesterol, systolic blood pressure, diabetes, and smoking status.

Novel Risk Markers: The guideline discusses the potential utility of novel risk markers such as high-sensitivity C-reactive protein (hs-CRP), coronary artery calcium (CAC) score, and ankle-brachial index (ABI) in improving risk assessment.

Long-Term Risk Assessment: The guideline suggests assessing long-term (≥ 15 years) or lifetime risk of ASCVD in adults aged 20 to 59 years who are free from ASCVD and are not at high short-term risk.

2019 ACC/AHA Guideline on the Primary Prevention of Cardiovascular Disease ⁽⁹⁾

Study Design: The guideline is based on a comprehensive review of existing literature, including randomized controlled trials (RCTs), systematic reviews, meta-analyses, and observational studies. The evidence was gathered from various databases such as Ovid MEDLINE, PubMed, Cochrane Library, and others, covering research published between May and July 2018. The recommendations are evidence-based and supported by extensive evidence tables included in the online data supplement.

Target Population: The guideline addresses the primary prevention of cardiovascular disease (CVD) in adults aged 18 years and older. It focuses on outcomes related to atherosclerotic cardiovascular disease (ASCVD), heart failure, and atrial fibrillation. The recommendations are applicable to patients with or at risk of developing CVD, with a particular emphasis on those in the United States, although they are relevant globally.

Key Factors:

Lifestyle Factors: Recommendations on nutrition and diet, exercise and physical activity, weight management, and tobacco cessation.

Medical Interventions: Use of statins, antihypertensive medications, and aspirin for primary prevention.

Patient-Centered Approaches: Emphasis on team-based care, shared decision-making, and assessment of social determinants of health.

Risk Assessment: Use of tools like the pooled cohort equations (PCE) to estimate 10-year ASCVD risk and the coronary artery calcium score for risk stratification.

Cost and Value Considerations: Discussion on the cost-effectiveness of various preventive strategies.

ANALYSIS OF EVIDENCE

Shared Findings

All three articles focus on cardiovascular disease (CVD) and its prevention, assessment, and management. They emphasize the importance of lifestyle modifications, risk assessment, and appropriate use of diagnostic tools.

1. Lifestyle Modifications:

- **Arnett et al 2019 JACC:** This article highlights the significance of promoting a healthy lifestyle throughout life to prevent atherosclerotic cardiovascular disease (ASCVD), heart failure, and atrial fibrillation. It recommends a diet rich in vegetables, fruits, nuts, whole grains, lean proteins, and fish, along with regular physical activity. ⁽⁹⁾
- **Goff et al 2014 Circ:** Similarly, this article underscores the importance of lifestyle modifications, including diet and exercise, in reducing cardiovascular risk. It provides guidelines for assessing cardiovascular risk and emphasizes the role of lifestyle changes in managing blood cholesterol and obesity. ⁽⁸⁾
- **Winchester et al 2023 JACC:** This article also stresses the importance of lifestyle modifications in managing chronic coronary disease (CCD). It includes recommendations for exercise and diet as part of the appropriate use criteria for various diagnostic tests. ⁽¹²⁾

2. Risk Assessment:

- **Arnett et al 2019 JACC:** The article provides a comprehensive guideline for the primary prevention of cardiovascular disease, including risk assessment tools like the pooled cohort equations to estimate 10-year ASCVD risk. ⁽⁹⁾
- **Goff et al 2014 Circ:** This article focuses on the development of new pooled cohort ASCVD risk equations and provides recommendations for assessing 10-year risk of a first hard ASCVD event. ⁽⁸⁾
- **Winchester et al 2023 JACC:** The article includes risk assessment as part of the appropriate use criteria for detecting and managing CCD. It provides guidelines for using various diagnostic tools based on the patient's risk profile. ⁽¹²⁾

POLICY HISTORY

Date	Summary
July 2025	• This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7272-01 for Electron-Beam Tomography or Non-Contrast Coronary Computed Tomography and ECG 029 for Electron-Beam Tomography or Non-Contrast Coronary Computed Tomography into Evolent Clinical Guideline 7272 for Coronary Artery Calcium Scoring by Electron Beam Computed Tomography (EBCT) or Non-Contrast Coronary Computed Tomography (CCT) ○ This guideline also merges Procedure Codes from these two Evolent guidelines • Added new bullet-point to the General Statement section • Clarified indications for CAC testing • Added a Summary of Evidence and Analysis of Evidence

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 7275 for Coronary Artery Computed Tomography Angiography (CCTA)

Guideline Number: Evolent_CG_7275	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Indications for determining medical necessity for Coronary and/or Cardiac Computed Tomographic Angiography (CCTA). Patients should be on maximally tolerated guideline directed medical therapy (GDMT), when applicable.

Special Note

See legislative language for specific mandates in Washington State.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ⁽¹⁻⁵⁾

INDICATIONS FOR CORONARY COMPUTED TOMOGRAPHIC ANGIOGRAPHY (CCTA) ^(6–9)

Evaluation in Suspected Coronary Artery Disease (CAD) ^(10–14)

Probability

- Low pretest probability patients should be considered for exercise treadmill test (ETT) unless other criteria for CCTA are met ⁽¹⁵⁾
- Intermediate and high pretest probability patients ⁽¹⁶⁾
- Exercise ECG stress test with intermediate Duke Treadmill (- 10 to + 4)

Asymptomatic Patients

- Asymptomatic patients without known CAD:
 - Previously unevaluated ECG evidence of possible myocardial ischemia including ischemic ST segment or T wave abnormalities (see Uninterpretable baseline ECG section)
 - Previously unevaluated pathologic Q waves (see Uninterpretable baseline ECG section)
 - Previously unevaluated left bundle branch block

Symptomatic Patients

- Intermediate and high pretest probability patients ⁽¹⁶⁾
- Low pretest probability patients should be considered for exercise treadmill test (ETT) unless other criteria for CCTA are met ⁽¹⁵⁾
- Exercise ECG stress test with intermediate Duke Treadmill (- 10 to + 4)
- CCTA is being performed to avoid performing cardiac catheterization in patients with chest pain syndrome with intermediate pretest probability of CAD, uninterpretable ECG and are not able to exercise with no prior CCTA done within the last 12 months who have ^(15,16):
 - Equivocal, borderline, or discordant stress evaluation with continued symptoms concerning for CAD (**AUC 8**) ⁽⁸⁾
 - Repeat testing in patient with new or worsening symptoms since prior normal stress imaging (**AUC 7**) ⁽⁸⁾
 - Chest pain of uncertain etiology, when non-invasive tests are negative, but symptoms are typical and management requires that significant coronary artery disease be excluded (**AUC 7**) ⁽⁸⁾

Unevaluated Acute Coronary Syndrome (ACS)

- Prior acute coronary syndrome (with documentation in MD notes), without invasive or

non-invasive coronary evaluation within last 12 months

- Ventricular wall motion abnormality demonstrated by another imaging modality and CCTA is being performed to determine if the patient has occlusive coronary artery disease. No imaging stress test within the last 12 months

Heart Failure

- Newly diagnosed clinical systolic heart failure or diastolic heart failure, with reasonable suspicion of cardiac ischemia unless invasive coronary angiography is planned (SE diversion not required) ^(17,18) **(AUC 7)** ⁽⁸⁾

Heart Valve

- Before valve surgery or transcatheter intervention as an alternative to coronary angiography ^(19–21)
- To establish the etiology of mitral regurgitation ⁽²¹⁾
- Pre-TAVR (transaortic valve replacement) evaluation as an alternative to coronary angiography ^(22,23)

Arrhythmias

- Ventricular arrhythmias
 - Sustained ventricular tachycardia (VT) > 100 bpm, ventricular fibrillation (VF), or exercise-induced VT, when invasive coronary arteriography is not immediately planned ⁽¹⁸⁾
- Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, or frequent PVCs (defined as greater than or equal to 30/hour on remote monitoring) without known cause or associated cardiac pathology, when an exercise ECG cannot be performed ⁽²⁰⁾

Prior To Elective Non-Cardiac Surgery In Asymptomatic Patients

- An intermediate or high risk surgery with of one or more risk factors (see below), AND documentation of an inability to walk (or < 4 METs) AND there has not been an imaging stress test within 1 year ^(24–26)
 - Risk factors: history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine > 2.0 mg/dL
 - Surgical Risk:
 - High risk surgery: Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - Intermediate risk surgery: Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery
 - Low risk surgery: Endoscopic procedures, superficial procedure, cataract

surgery, breast surgery

- Planning for any organ or stem cell transplantation is an indication for preoperative MPI, if there has not been a conclusive stress evaluation, CTA, or heart catheterization within the past year, at the discretion of the transplant service ^(8,27)

Post Cardiac Transplant (SE Diversion Not Required)

- Annually, for the first five years post cardiac transplantation, in a patient not undergoing invasive coronary arteriography

Heart Anomaly or Aneurysm

- Evaluation of coronary anomaly or aneurysm ^(24,25,28–30)
 - Evaluation prior to planned repair
 - Evaluation due to change in clinical status and/or new concerning signs or symptoms
 - Kawasaki disease and MIS-C follow up – for medium sized or greater aneurysms ⁽²⁶⁾ periodic surveillance can be considered every 2-5 years. Once aneurysmal size has reduced to small aneurysms, surveillance can be performed every 3-5 years. No further surveillance once normalized.
- Evaluation of suspected pulmonary embolism

NOTE: CMR is favored in younger patients for coronary anomaly evaluation ^(27,28)

PCI or CABG

- Prior PCI or CABG history
 - Symptomatic patient with prior PCI or CABG history, with angina interfering in performing daily activities, despite being on guideline directed medical therapy, and with an equivocal stress test results. No prior CCTA done within the last 12 months **(AUC 7)** ⁽⁸⁾
- Evaluation of coronary artery bypass grafts, to assess ^(8,31):
 - Patency and location when invasive coronary arteriography was either nondiagnostic or not performed/planned **(AUC 7)** ⁽⁸⁾
 - Location of grafts prior to cardiac or another chest surgery **(AUC 7)** ⁽⁸⁾

Limited Prior or Replacement Imaging

- CCTA may be performed in patients who cannot tolerate moderate sedation that is required during transesophageal echo (TEE), for pre procedural evaluation for Left Atrial (LA) Appendage (LAA) Occlusion to look for LA/LAA thrombus, spontaneous contrast, LAA morphology and dimensions. *TEE however remains the preferred choice of modality for this procedure.*

Electrophysiologic Procedure Planning

- Evaluation of anatomy (pulmonary vein isolation planning) prior to radiofrequency ablation

LEGISLATIVE LANGUAGE

Washington

20211105A - Noninvasive Cardiac Imaging for Coronary Artery Disease ⁽³²⁾

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
 - Adult patients with known CAD who have new or worsening symptoms.
- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

CODING AND STANDARDS

Codes

75574

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

A coronary computerized tomography angiogram (CCTA) is a noninvasive imaging study that uses intravenously administered contrast material and high-resolution, rapid imaging computed tomography (CT) ^(33,34)

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽²⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score – 4-6
- Rarely Appropriate Care - Median Score 1-3

Reduction in CCTA test quality

- The following can reduce the quality of the test in patients with ⁽⁸⁾:
 - Morbid obesity
 - High or irregular heart rates
 - Severe coronary calcification

Patient Selection Criteria

- Patient selection for CCTA must be considered and may be inappropriate for the following:
 - Known history of severe and/or anaphylactic contrast reaction
 - Inability to cooperate with scan acquisition and/or breath-hold instructions
 - Pregnancy
 - Clinical instability (e.g., acute myocardial infarction, decompensated heart failure, severe hypotension)
 - Renal Impairment as defined by local protocols
 - Image quality depends on keeping HR optimally < 60 bpm (after beta blockers), a regular rhythm, stents > 3.0 mm in diameter, and vessels requiring imaging ≥ 1.5 mm diameter ⁽³⁵⁾

Definitions

- Stable patients without known CAD fall into 2 categories ^(6–8):
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section)
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant CAD
- Three Types of Chest Pain or Discomfort:
 - **Typical Angina (Definite)** is defined as including ALL **3** characteristics:
 - Substernal chest pain or discomfort with characteristic quality and duration
 - Provoked by exertion or emotional stress
 - Relieved by rest and/or nitroglycerin
 - **Atypical Angina (Probable)** has only **2** of the above characteristics
 - **Nonanginal Chest Pain/Discomfort** has only **0 - 1** of the above characteristics
- The medical record should provide enough detail to establish the type of chest pain. From those details, the pretest probability of significant CAD is estimated from the Diamond Forrester Table below, recognizing that additional coronary risk factors could increase pretest probability ⁽⁸⁾:

Diamond Forrester Table ^(36,37)

Age (Years)	Gender	Typical/ Definite Angina Pectoris	Atypical/ Probable Angina Pectoris	Nonanginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40 – 49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50 – 59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very Low: < 5% pretest probability of CAD

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- An uninterpretable baseline ECG includes ⁽⁶⁾:
 - ST segment depression is considered significant when there is 1 mm or more, not for non-specific ST - T wave changes
 - Ischemic-looking T waves are considered significant when there are at least 2.5 mm inversions (excluding V1 and V2)
 - Left ventricular hypertrophy (LVH) with repolarization abnormalities, Wolff-Parkinson-White (WPW) syndrome, a ventricular paced rhythm, or left bundle branch block
 - Digitalis use with associated ST - T abnormalities
 - Resting HR under 50 bpm on a beta blocker and an anticipated suboptimal workload
 - Note: Right bundle branch block (RBBB) with less than 1 mm ST depression at rest may be suitable for ECG treadmill testing
- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - > 40 ms (1 mm) wide
 - > 2 mm deep
 - > 25% of depth of QRS complex

- ECG Stress Test Alone versus Stress Testing with Imaging
 - Prominent scenarios suitable for an ECG stress test **WITHOUT** imaging (i.e., exercise treadmill ECG test) require that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise ⁽⁸⁾:
 - The (symptomatic) low pretest probability patient who can exercise and has an interpretable ECG ⁽⁸⁾
 - The patient who is under evaluation for exercise-induced arrhythmia
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - For the evaluation of syncope or presyncope during exertion ⁽³⁸⁾
- Duke Exercise ECG Treadmill Score ⁽³⁹⁾
 - Calculates risk from ECG treadmill alone:
 - Duke treadmill score (DTS) equation is: $DTS = \text{exercise time in minutes} - (5 \times \text{ST deviation in mm or } 0.1 \text{ mV increments}) - (4 \times \text{exercise angina score})$, with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting
 - The score ranges from - 25 to + 15 with values corresponding to low-risk (score of $\geq + 5$), intermediate risk (scores ranging from - 10 to + 4), and high-risk (score of $\leq - 11$) categories
- Scenarios that can additionally support a CCTA over a regular exercise treadmill test in the low probability scenario ⁽⁴⁰⁾
 - Inability to Exercise
 - Physical limitations precluding ability to exercise for at least 3 full minutes of Bruce protocol
 - The patient has limited functional capacity (< 4 METS) such as **ONE** of the following:
 - ☐ Unable to take care of their activities of daily living (ADLs) or ambulate
 - ☐ Unable to walk 2 blocks on level ground
 - ☐ Unable to climb 1 flight of stairs
 - ☐ Unable to vacuum, dust, do dishes, sweep, or carry a small grocery bag
 - Other Comorbidities
 - Prior cardiac surgery (coronary artery bypass graft or valvular)
 - Left ventricular ejection fraction $\leq 50\%$
 - Severe chronic obstructive pulmonary disease (COPD) with pulmonary function test (PFT) documentation, severe shortness of breath on minimal exertion, or requirement of home oxygen during the day
 - Poorly controlled hypertension, with systolic blood pressure (BP) > 180 or Diastolic BP > 120

- ECG and Echo-Related Baseline Findings
 - Pacemaker or implantable cardioverter defibrillator (ICD)
 - Resting wall motion abnormalities on echocardiography
 - Complete LBBB
- Risk-Related scenarios
 - Intermediate or high global risk in patients requiring type IC antiarrhythmic drugs
 - Arrhythmia risk with exercise
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years.
 - **CAD Risk—Low**
 - 10-year absolute coronary or cardiovascular risk less than 10%
 - **CAD Risk—Moderate**
 - 10-year absolute coronary or cardiovascular risk between 10% and 20%
 - **CAD Risk—High**
 - 10-year absolute coronary or cardiovascular risk of greater than 20%

Websites for Global Cardiovascular Risk Calculators* (41–45)

Risk Calculator	Websites for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

Risk Calculator	Websites for Online Calculator
With addition of Coronary Artery Calcium Score, for CAD-only risk	

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

- **Definitions of Coronary Artery Disease** ^(6,7,46–48)

- Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).
 - Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. It is not a diagnostic tool so much as it is a **risk stratification** tool. Its incorporation into global risk can be achieved by using the MESA risk calculator.
 - Stenoses $\geq 70\%$ are considered obstructive coronary artery disease (also referred to as clinically significant), while stenoses $\leq 70\%$ are considered non-obstructive coronary artery disease ⁽⁴⁶⁾
 - Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate) generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69% ⁽⁸⁾
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum luminal cross-sectional area on IVUS ≤ 6 square mm ^(6,47,48)
 - FFR (fractional flow reserve) ≤ 0.80 for a major vessel ^(47,48)
 - iFR (instantaneous wave-free ratio) ≤ 0.89 for a major vessel ^(48–51)
 - Demonstrable ischemic findings on stress testing (ECG or stress imaging), that are at least mild in degree
 - A major vessel would be a coronary vessel that would be amenable to revascularization, if indicated. This assessment is made based on the diameter of the vessel and/or the extent of myocardial territory served by the vessel.
 - FFR is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow.
 - Newer technology that estimates FFR from CCTA images is covered under the Evolent Clinical Guideline 062-1 for Fractional Flow Reserve CT.

- **Anginal Equivalent** ^(6,38,52)

- Development of an anginal equivalent (e.g., shortness of breath, fatigue, or

weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia), by presentation of clinical data such as respiratory rate, oximetry, lung exam, etc. (as well as D-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Syncope, per se, is not an anginal equivalent.

Acronyms/Abbreviations

ACS: Acute coronary syndrome
ADLs: Activities of daily living
CABG: Coronary artery bypass grafting surgery
CAD: Coronary artery disease
CCS: Coronary calcium score
CCTA: Coronary computed tomography angiography
CT(A): Computed tomography (angiography)
COPD: Chronic obstructive pulmonary disease
DTS: Duke Treadmill Score
ECG: Electrocardiogram
EF: Ejection fraction
FFR: Fractional flow reserve
ICD: Implantable cardioverter-defibrillator
iFR: Instantaneous wave-free ratio or instant flow reserve
IVUS: Intravascular ultrasound
LBBB: Left bundle branch block
LVH: Left ventricular hypertrophy
MESA: Multi-Ethnic Study of Atherosclerosis
METS: Metabolic equivalents
MI: Myocardial infarction
MPI: Myocardial perfusion imaging
PCI: Percutaneous coronary intervention
PFT: Pulmonary function test
RBBB: Right bundle branch block
SE: Stress echocardiography
TTE: Transthoracic echocardiography

WPW: Wolff-Parkinson-White syndrome

SUMMARY OF EVIDENCE

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease ⁽⁸⁾

Study Design: The study is a report by the American College of Cardiology (ACC) Solution Set Oversight Committee, in collaboration with several other cardiovascular societies. It updates the prior AUC for various cardiovascular imaging modalities, including radionuclide imaging, stress echocardiography, calcium scoring, coronary computed tomography angiography (CCTA), stress cardiac magnetic resonance (CMR), and invasive coronary angiography.

Target Population: The target population includes patients with known or suspected CCD, which encompasses stable ischemic heart disease (SIHD). The clinical scenarios cover both symptomatic and asymptomatic patients, with and without prior testing or revascularization.

Key Factors:

Clinical Scenarios: The document outlines 64 clinical scenarios for the detection and risk assessment of CCD, drawn from common applications and current clinical practice guidelines.

Rating Process: The clinical scenarios were rated by an independent panel using a modified Delphi process. Ratings were categorized as Appropriate (7-9), May Be Appropriate (4-6), or Rarely Appropriate (1-3).

Updates and Changes: Key changes include the removal of preoperative testing scenarios, simplification of clinical scenario tables, and incorporation of new evidence and guidelines.

Assumptions: The study assumes that each test is performed and interpreted by trained professionals, and that patients are receiving optimal standard care.

Advantages and Limitations: The document provides a table outlining the advantages and limitations of various imaging modalities, such as echocardiography, SPECT, PET, CMR, CCTA, and invasive angiography.

2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease ⁽⁶⁾

Study Design: The guideline is based on a comprehensive literature search conducted from September 2021 to May 2022. The search included clinical studies, systematic reviews, meta-analyses, and other evidence conducted on human participants. The databases used for the search included MEDLINE (through PubMed), EMBASE, the Cochrane Library, and the Agency for Healthcare Research and Quality. The guideline was developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines, in collaboration with and endorsed by several other professional organizations.

Target Population: The guideline is intended for clinicians in primary care and cardiology specialties who care for patients with CCD in the outpatient setting. The target population includes patients with chronic coronary disease, which encompasses a heterogeneous group of conditions such as obstructive and nonobstructive coronary artery disease (CAD) with or without previous myocardial infarction (MI) or revascularization, ischemic heart disease diagnosed only by noninvasive testing, and chronic angina syndromes with varying underlying causes.

Key Factors:

Epidemiology and General Principles: The guideline addresses the prevalence of CCD, which varies by age, sex, race, ethnicity, and geographic region. It also highlights the role of social determinants of health in both risk and outcomes from CCD.

Evaluation, Diagnosis, and Risk Stratification: The guideline recommends the use of stress testing, invasive coronary angiography, and other diagnostic tools to assess the presence and extent of myocardial ischemia and guide therapeutic decision-making.

Treatment: The guideline emphasizes a patient-centered approach to treatment, incorporating shared decision-making, social determinants of health, and team-based care. It includes recommendations for lifestyle modifications, pharmacologic therapies, and revascularization.

Special Populations: The guideline provides specific recommendations for managing CCD in special populations, including patients with heart failure, valvular heart disease, young adults, cancer, women (including pregnancy and postmenopausal hormone therapy), older adults, chronic kidney disease, HIV, autoimmune disorders, and heart transplant recipients.

Patient Follow-Up: The guideline recommends regular follow-up to assess symptoms, functional status, adherence to lifestyle and medical interventions, and monitoring for complications of CCD and its treatments.

Cost and Value Considerations: The guideline includes recommendations for discussing out-of-pocket costs with patients to preempt cost-related nonadherence and ensure access to effective therapies.

Society for Cardiovascular Magnetic Resonance perspective on the ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 multi-modality appropriate use criteria for the detection and risk assessment of chronic coronary disease ⁽⁹⁾

Study Design: The study design involves a review and discussion of the recommendations in the 2023 AUC, which updates the 2013 AUC for the management of stable ischemic heart disease (SIHD).

Target Population: The target population includes symptomatic and asymptomatic patients with a spectrum of scenarios in each of the two categories. The document aims to complement clinical practice guidelines and aid clinicians in decision-making for common clinical scenarios in CCD and implement best practices in patient care.

Key Factors:

The diagnostic accuracy, cost-effectiveness, and predictive value of stress perfusion cardiovascular magnetic resonance (CMR) in patients with CCD.

The comparison of stress CMR with other imaging modalities such as nuclear imaging, stress echocardiography, and coronary computed tomography angiography (CCTA).

The advantages and limitations of CMR, including its ability to assess wall motion, ischemia, and infarction in one study, and its higher spatial resolution for smaller-sized hearts.

The importance of clinician judgment, test advantages and disadvantages, and local expertise in choosing the appropriate test for an individual patient.

The inclusion of new categories such as "No Test" for low-risk patients and the emphasis on patient-specific and local factors in decision-making.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(6,8,9)

1. **Chronic Coronary Disease (CCD) Management:** All three articles emphasize the importance of managing CCD through a combination of lifestyle changes, pharmacologic therapies, and diagnostic testing. They highlight the need for a patient-centered approach that considers individual risk factors, symptoms, and preferences.
2. **Diagnostic Testing:** The articles agree on the use of various diagnostic modalities such as stress echocardiography, myocardial perfusion imaging (MPI), cardiovascular magnetic resonance (CMR), and coronary computed tomography angiography (CCTA) for the detection and risk assessment of CCD. They emphasize the importance of selecting the appropriate test based on the patient's clinical scenario and the availability of local expertise and equipment.
3. **Appropriate Use Criteria (AUC):** Both the Bandettini et al. and Winchester et al. articles discuss the AUC for multimodality imaging in CCD. They provide detailed guidelines on when specific tests are appropriate, may be appropriate, or rarely appropriate based on different clinical scenarios.

POLICY HISTORY

Date	Summary
July 2025	• This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7275-01 for Coronary CT Angiography and ECG 062 for Coronary CT Angiography into Evolent Clinical Guideline 7275 for Coronary Artery Computed Tomography Angiography (CCTA) ○ This guideline also merges Procedure Codes from these two Evolent guidelines

Date	Summary
	• Added new bullet-point to the General Statement section • Added indications for Unevaluated Acute Coronary Syndrome, Arrhythmias, Prior To Elective Non-Cardiac Surgery In Asymptomatic Patients, and Post Cardiac Transplant • Added a Summary of Evidence and Analysis of Evidence • Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2006 for Abdominal Aorta Computed Tomography Angiography with Lower Extremity Runoff

Guideline Number: Evolut_CG_2006	<u>Applicable Codes</u>	
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Original Date: July 2008	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. -If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Computed tomography angiography (CTA) generates images of the blood vessels in the abdomen and lower extremities that can be evaluated for evidence of stenosis or occlusion with the use of ionizing radiation, which is a potential hazard in patients with impaired renal function.

INDICATIONS

Peripheral Vascular Disease ^(1–4)

NOTE: When vascular imaging of the aorta and both legs is required, (sometimes incorrectly requested as Abd/Pelvis CTA & Lower Extremity CTA Runoff), only **ONE** authorization request is required, using CPT Code 75635 (CTA Abdominal Aorta with Lower Extremity Runoff). This study provides for imaging of the abdomen, pelvis, and both legs. A separate authorization for Lower Extremity CTA is **NOT** needed.

For evaluation of known or suspected lower extremity vascular disease:

- For known or suspected atherosclerotic peripheral arterial disease when any **ONE** of the following non-invasive studies are abnormal or indeterminate:
 - Ankle-brachial index (ABI) (< 0.9 is the cutoff for diagnosis of peripheral arterial disease and >1.4 is considered inconclusive)
 - Toe brachial index (< 0.7 is the cutoff for diagnosis of peripheral arterial disease)
 - Segmental pressure test (a pressure gradient > 20 mmHg is considered abnormal)
 - Doppler ultrasound

- Treadmill test
- 6-minute walking test
- For acute critical limb ischemia with any **ONE** of the below clinical signs of peripheral vascular disease:
 - Ischemic rest pain
 - Tissue loss
 - Gangrene

NOTE: Prior ultrasound is **NOT** needed ^(1,2)

- After prior stenting or surgery (arterial and/or venous) with any **ONE** of the following:
 - Recurrent symptoms
 - Signs of recurrent disease on examination
 - Abnormal / indeterminate non-invasive testing or imaging (Such as, ankle brachial index (ABI), ultrasound)

PREOPERATIVE OR POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative Evaluation ⁽⁵⁾:

- Evaluation of interventional vascular procedures for luminal patency versus restenosis due to conditions such as atherosclerosis, thromboembolism, and intimal hyperplasia
- Imaging of the area requested is needed to develop a surgical plan

Postoperative Evaluation ⁽⁵⁾

- Known or suspected complications
- A clinical reasoning is provided how imaging may change management

NOTE: This section applies only within the first few months following surgery

FURTHER EVALUATION OF INDETERMINATE FINDINGS

Unless follow-up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious

interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam)

IMAGING IN KNOWN GENETIC CONDITIONS

- Williams Syndrome ⁽⁶⁾:
 - Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis)
- For other syndromes and rare diseases not otherwise addressed in the guideline, coverage is based on a case-by-case basis using societal guidance

Combination Studies for Known Genetic Conditions

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdominal Aorta CTA with Lower Extremity Runoff / Chest CTA

- Williams Syndrome: Abnormal vascular exam or imaging findings (such as concern for renal artery stenosis, diminished pulses, bruits or signs of diffuse thoracic aortic stenosis ⁽⁶⁾)

OTHER COMBINATIONS STUDIES WITH ABDOMINAL AORTA CTA WITH LOWER EXTREMITY RUNOFF

NOTE: When medical necessity is met for an individual study **AND** conscious sedation is required (such as for young pediatric patients or patients with significant developmental delay), the entire combination is indicated)

Abdominal Aorta CTA with Lower Extremity Runoff and Chest CTA

- To evaluate for an embolic source of lower extremity thromboembolic vascular disease

NOTE: Echocardiogram is also indicated as the heart is the most commonly reported source of lower extremity emboli

CODING AND STANDARDS

Codes

75635

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Evolent Clinical Guideline 2006 for Abdominal Aorta Computed Tomography Angiography with Lower Extremity Runoff

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindications and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Lower Extremity Arterial Claudication-Imaging Assessment for Revascularization: 2022 Update ⁽¹⁾

Study Design: This document is an update on the ACR Appropriateness Criteria for imaging assessment in lower extremity arterial claudication, focusing on revascularization. It is based on evidence-based guidelines reviewed annually by a multidisciplinary expert panel.

Target Population: The target population includes patients with arterial claudication, a common manifestation of peripheral artery disease (PAD), which affects 3% to 7% of the general population and 20% of people over 70 years of age.

Key Factors: The document discusses the appropriate use of ultrasound, invasive arteriography, MR angiography, and CT angiography for diagnosing and treating claudication. Claudication prevalence ranges from 1.6% to almost 8%, depending on various factors. Noninvasive hemodynamic tests like the ankle-brachial index are essential for diagnosis. The document emphasizes the importance of imaging in diagnosing individual lesions and triaging patients for possible percutaneous or surgical intervention.

Society for Vascular Surgery practice guidelines for atherosclerotic occlusive disease of the lower extremities: Management of asymptomatic disease and claudication ⁽²⁾

Study Design: This document provides practice guidelines for managing atherosclerotic occlusive disease of the lower extremities, focusing on asymptomatic disease and claudication. The guidelines were developed by the Society for Vascular Surgery Lower Extremity Guidelines Writing Group.

Target Population: The target population includes patients with peripheral arterial disease (PAD), which affects an estimated 8 to 12 million Americans. The prevalence of PAD increases with age, smoking, diabetes, hypertension, and obesity.

Key Factors: The document highlights the association between PAD and risk factors such as age, smoking, diabetes, hypertension, and hypercholesterolemia. The ankle-brachial index (ABI) is recommended as the first-line noninvasive test to diagnose PAD. Routine screening for PAD in asymptomatic individuals is not recommended. Emphasis is placed on risk factor modification, medical therapies, and exercise programs to improve cardiovascular health and functional performance. Revascularization for intermittent claudication (IC) is appropriate for selected patients with disabling symptoms. The guidelines recommend multidisciplinary smoking cessation interventions, statin therapy, optimizing diabetes control, and antiplatelet therapy for patients with IC.

ANALYSIS OF EVIDENCE

Analysis ^(1,2):

In summary, both articles provide valuable insights into the use of CTA for imaging the abdominal aorta and lower extremities. They agree on the high accuracy and utility of CTA, its advantages over other imaging modalities, and its ability to detect nonvascular findings. However, they differ in their focus on technical considerations, clinical guidelines, and radiation exposure. By integrating the findings from both articles, healthcare providers can make more informed decisions about the use of CTA in the management of PAD.

Shared Findings

Both articles emphasize the importance of CTA (Computed Tomography Angiography) in the imaging and assessment of peripheral arterial disease (PAD), particularly for the abdominal aorta and lower extremities. They agree on several key points:

- Both articles highlight the high sensitivity and specificity of CTA for detecting stenoses greater than 50% in diameter. CTA is praised for its ability to provide volumetric images, which allow for extensive post-processing and the creation of arterial road maps.
- CTA is considered superior to catheter angiography for imaging the aorta and iliac arteries. It can readily detect stenosis caused by plaque or thrombus and is more clinically useful than duplex ultrasound (US) for assessing bypass grafts.
- Both articles note that CTA, like MRA (Magnetic Resonance Angiography), is a cross-sectional technique that can show nonvascular findings, such as aneurysms and cystic adventitial disease, which are not detected with catheter arteriography.

POLICY HISTORY

Date	Summary
July 2025	- Added a Summary of Evidence and Analysis of Evidence - Last revised date adjusted to July - Removed “on prior imaging” under further evaluation to align with guidelines
June 2025	- This guideline number changed from 035 to 2006 - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Updated language in the preoperative and postoperative section - Segment added to the combinations studies about if the required use of conscious sedation is needed the entire combination is indicated - Reduced background section
June 2024	- Updated references - Added Combo studies, Genetic Syndromes and Rare Diseases, Contraindications and Preferred Studies sections - Updated guideline name

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2010 for Magnetic Resonance Spectroscopy (MRS)

Guideline Number: Evolent_CG_2010	<u>Applicable Codes</u>	
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Original Date: April 2007	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Magnetic Resonance Spectroscopy

Magnetic resonance spectroscopy (MRS) is a noninvasive imaging technique which can be useful when conventional imaging (CT or MR) provides limited information regarding a specific clinical question. MRS is sensitive but not specific and results should be closely correlated with clinical history, physical examination, laboratory results, and diagnostic imaging studies. Magnetic resonance spectroscopy (MRS) should be considered as an adjunct to conventional imaging rather than replacement for histopathological evaluation. ⁽¹⁾

INDICATIONS FOR BRAIN MRS ⁽²⁾

- For the evaluation of a recurrent or residual brain tumor to differentiate from post-treatment changes, e.g., radiation necrosis. ⁽²⁻⁴⁾
- For further evaluation of a brain lesion to distinguish a brain tumor from other non-tumor diagnoses (e.g., abscess or other infectious or inflammatory process).
- For suspected inherited metabolic disorders such as Canavan disease and primary mitochondrial disorders. ⁽⁵⁾
 - Can be done in combination with Brain MRI if not previously performed. ^(6,7)

NOTE: MRS remains experimental/investigational for

- Pre-operative grading and differentiation of high grade from low grade gliomas ^(3,8)



- Most inherited metabolic conditions ⁽⁵⁾ (excluding Canavan disease and primary mitochondrial disorders, see above)
- Neurodegenerative disease, epilepsy, stroke, traumatic brain injury and neonatal hypoxia-ischemia ^(9,10)

CODING AND STANDARDS

Codes

76390, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Magnetic resonance spectroscopy (MRS) determines the concentration of brain metabolites, such as N-acetylaspartate, choline, creatine, and lactate, within the body tissue examined. Radiofrequency waves are translated into biochemical composition of the scanned tissue; the resulting metabolic profile is useful in identifying brain tumors, e.g., differentiating neoplastic and non-neoplastic brain lesions.

In terms of brain tumor evaluation and classification, carefully designed multi-center trials complying with criteria of evidence-based medicine have not yet been completed. ⁽¹¹⁾

Tumor Recurrence vs. Radiation Necrosis ⁽³⁾

Differentiation between recurrent brain tumors and treatment related injury, e.g., radiation necrosis, is difficult using conventional MRI. MRS is a quantitative approach, measuring various brain metabolic markers, to help in the differentiation of recurrent tumors vs. radiation

necrosis.⁽⁴⁾ However, no consensus exists regarding the value of this in clinical decision making, and no approach has yet been validated to be sufficiently accurate.^(2,3)

Inherited Metabolic Conditions⁽⁵⁾

Although Brain MRS may show abnormalities in many inherited metabolic conditions, primary mitochondrial disease, storage diseases and other neurometabolic disorders (including leukodystrophies), its role in the diagnosis, prognosis, and management of most of these conditions is not well established by research and condition-specific guidelines. In a select few conditions MRS does have a more specific role in diagnosis and/or management (primary mitochondrial disorders and Canavan disease). For most of these conditions, Brain MRS is considered Experimental/Investigational. In all cases, basic work-up should first be completed including appropriate family history for inheritance and specific labs related to the suspected condition.

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR-ASNR-SPR Practice Parameter for the Performance And Interpretation of Magnetic Resonance Spectroscopy of the Central Nervous System⁽²⁾

- **Study Design:** This document outlines practice parameters and technical standards for performing and interpreting magnetic resonance spectroscopy (MRS) of the central nervous system. It is a consensus document developed by the American College of Radiology (ACR), the American Society of Neuroradiology (ASNR), and the Society for Pediatric Radiology (SPR).
- **Target Population:** The guidelines apply to both adult and pediatric patients undergoing MRS for various indications.
- **Key Factors:** The document details the indications for MRS, including evidence or suspicion of primary or secondary neoplasm, grading of primary glial neoplasm, differentiation of cystic lesions, evidence or suspicion of brain infection, seizures, neurodegenerative diseases, metabolic disorders, acute brain ischemia, demyelinating

disorders, and neurotoxicity. It also discusses the qualifications and responsibilities of personnel, specifications of the examination, and safety guidelines.

Differentiating Radiation-Induced Necrosis from Recurrent Brain Tumor Using MR Perfusion and Spectroscopy: A Meta-Analysis ⁽⁴⁾

- **Study Design:** This meta-analysis examined the roles of several metabolites in differentiating recurrent tumor from necrosis in patients with brain tumors using MR perfusion and spectroscopy. It included two-armed, prospective or retrospective studies.
- **Target Population:** The studies included patients with primary brain tumors or brain metastasis.
- **Key Factors:** The meta-analysis found that MR spectroscopy and MR perfusion using choline/N-acetyl aspartate (Cho/NAA) and choline/creatine (Cho/Cr) ratios and relative cerebral blood volume (rCBV) may increase the accuracy of differentiating necrosis from recurrent tumor. The pooled difference in means indicated that the average rCBV, Cho/Cr ratio, and Cho/NAA ratio were significantly higher in tumor recurrence compared with radiation injury.

Clinical Applications of Magnetic Resonance Spectroscopy in Brain Tumors ⁽³⁾

- **Study Design:** This document provides an overview of the clinical applications of MRS in brain tumor imaging, including general imaging principles, key imaged metabolites, and practical limitations.
- **Target Population:** The guidelines are intended for patients with brain tumors, including glioblastoma, lymphoma, and metastases.
- **Key Factors:** The document discusses the use of MRS in differentiating primary brain tumors from other potential mimics, estimating tumor grade, and differentiating tumor recurrence from radiation effects. It highlights the importance of interpreting MRS alongside conventional imaging and clinical presentation. The document also addresses the limitations of MRS, such as overlap between spectroscopic appearances of different pathologies and technical challenges.

ANALYSIS OF EVIDENCE

Shared Conclusions ⁽²⁻⁴⁾:

- **Importance of MRS:** All three documents highlight the importance of MRS in the diagnosis and management of brain tumors. They emphasize its role in differentiating tumor recurrence from radiation effects, grading gliomas, and identifying various brain pathologies.
- **Indications for Use:** The documents agree on the primary indications for MRS, such as evidence or suspicion of neoplasm, grading of gliomas, and differentiation of cystic lesions.



- **Technical Standards and Safety:** The ACR Practice Parameters and Weinberg et al. both discuss the technical standards and safety guidelines associated with MRS, emphasizing the need for appropriate training and qualifications for personnel.

Differing Conclusions ^(2–4):

- **Target Population:** While the ACR Practice Parameters apply to both adult and pediatric patients, Chuang et al. and Weinberg et al. focus primarily on adult patients with specific brain tumors and metastases.

Summary ^(2–4)

In summary, the three documents provide a comprehensive overview of the evidence for brain MRS, highlighting its importance in the diagnosis and management of brain tumors. They share common conclusions on the indications and technical standards for MRS, while differing in their target populations and specific recommendations for various clinical scenarios.

POLICY HISTORY

Date	Summary
June 2025	● This guideline replaces Evolent Clinical Guideline 003 For Brain Magnetic Resonance Spectroscopy (MRS) ● Guideline name changed to Magnetic Resonance Spectroscopy (MRS) ● Added third bullet to General Information ● Added Summary of Evidence and Analysis of Evidence ● Updated references and background.
May 2024	● Update references and background. ● Added Contraindications and preferred studies section. ● Added pediatric metabolic disorders section.



LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2061 for Unlisted Study

Guideline Number: Evolent_CG_2061	<u>Applicable Codes</u>	
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Original Date: September 2013	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Whole Body Magnetic Resonance Imaging (MRI) generates images of the whole body (skull base to mid-thigh) without the use of ionizing radiation. It is used to evaluate conditions where imaging of the whole body is needed such as certain genetic syndromes and rare diseases. MRI can also be used for radiation planning. CPT 76498 is used for either Whole Body MRI or radiation planning MRI.

Whole Body Low Dose Computed Tomography (CT) generates images of the whole skeleton and can be used when images of the entire skeletal system are needed such as for certain hematologic malignancies. CPT 76497 is used when Whole Body Low Dose CT is needed.

Special Note

When used for CT or MRI, another CPT code should be selected that describes the specific service being requested. This code is only to be used when there is not an existing CPT code to describe the requested imaging study. As there is no dedicated CPT code for whole body MRI or CT, the unlisted code is used when whole body imaging is needed rather than individual body part studies.

INDICATIONS FOR UNLISTED MRI

Unlisted MRI

Unlisted MRI (CPT Code 76498), can be used in the context of:

- Radiation treatment planning
- Screening in any of the following conditions (not an all-inclusive list):

- Opsoclonus-Myoclonus-Ataxia Syndrome (OMAS) ⁽¹⁾:
 - At diagnosis and
 - As clinically indicated
- Li-Fraumeni Syndrome (TP53) ^(2,3):
 - Annually
- Constitutional Mismatch Repair Deficiency (CMMRD) syndrome:
 - As clinically indicated
- Hereditary Retinoblastoma (RB1) ⁽⁴⁾:
 - Annually after age 8
- LZTR1-related Schwannomatosis ⁽⁵⁾:
 - Every 2 years starting at age 12
- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(5,6):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months age 19 months – 5 years
 - Annually after age 5
- Neurofibromatosis 1 (NF1) ⁽⁷⁾:
 - Annually
- Hereditary Paraganglioma-Pheochromocytoma (PGL/PCC) Syndromes (including SDHx mutations) ^(8,9):
 - Every 2 years

NOTE: Whole Body MRI using CPT 76498 is used for evaluation of the soft tissue and bone. For conditions where imaging of the bone marrow is needed (such as chronic recurrent multifocal osteomyelitis and smoldering/multiple myeloma), please see indications for Bone Marrow MRI (Evolent_CG_2007).

Combination Studies for Known Genetic Conditions

Brain/Breast/Whole Body MRI

- Li-Fraumeni (TP53) ⁽³⁾:
 - Annually

NOTE: Can include Abdomen MRI if meets family history requirement. Additional imaging may be needed based on patient-specific factors

Breast/Whole Body MRI

- Neurofibromatosis 1 (NF1) ⁽⁷⁾:
 - Annually starting at age 30

Abdomen/Whole Body MRI

- Hereditary PGL/PCC Syndromes (including SDHx mutations) ^(8,9):
 - Every 2 years (including at diagnosis)

Brain/Cervical/Thoracic/Lumbar/Whole Body MRI

- SMARCA4 and SMARCB1 (Includes SMARCB1-associated Schwannomatosis and Rhabdoid Tumor Predisposition Syndrome) ^(5,6):
 - At diagnosis
 - Monthly from age 0-6 months
 - Every 2 months from age 7-18 months
 - Every 3 months age 19 months – 5 years
 - Annually after age 5

INDICATIONS FOR UNLISTED CT

Unlisted CT

Unlisted CT (CPT Code 76497), can be used when imaging of the whole body is needed for certain hematologic malignancies:

- Low Dose Whole Body CT is indicated for the evaluation of the following conditions:
 - Multiple Myeloma - monoclonal proliferation of plasma cells with myeloma-defining CRAB (Calcium level elevation, Renal failure, Anemia, or Bone lesions) findings ⁽¹⁰⁾
 - Monoclonal Gammopathy of Undetermined Significance (MGUS) - monoclonal proliferation of plasma cells without myeloma-defining CRAB
 - Solitary Plasmacytoma - monoclonal plasma cells manifesting as a single tumor
 - Smoldering Multiple Myeloma - monoclonal proliferation of plasma cells in bone marrow and/or serum/urine with abnormal levels of monoclonal protein (asymptomatic precursor state of MM) ⁽¹⁰⁾
- Low Dose Whole Body CT for the **above conditions** is indicated at the following intervals:
 - Suspected Disease
 - Initial Staging of Known Disease
 - Restaging on Active Treatment

- Surveillance
 - Annually if asymptomatic
 - More frequent imaging as clinically indicated by signs/symptoms, laboratory, or radiographic concern for disease relapse or progression

CODING AND STANDARDS

Codes

Unlisted CT: 76497, +0722T

Unlisted MRI: 76498, +0698T

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Contraindicated and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include: impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester)
- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine

SUMMARY OF EVIDENCE

LZTR1- and SMARCB1-Related Schwannomatosis ⁽⁵⁾

Study Design: This study focuses on the clinical characteristics, diagnosis, and management of LZTR1- and SMARCB1-related schwannomatosis.

Target Population: Individuals with a predisposition to develop multiple non-intradermal schwannomas, typically presenting between the second and fourth decade of life.

Key Factors:

- Clinical Characteristics: The most common presenting feature is localized or diffuse pain or asymptomatic mass. Schwannomas most often affect peripheral nerves and spinal nerves.
- Diagnosis: Established through characteristic clinical findings and molecular genetic testing identifying heterozygous germline pathogenic variants in LZTR1 or SMARCB1.
- Management: Includes a comprehensive, multimodal approach to pain management, mental health referrals, surgery for schwannomas, and regular surveillance through neurologic examinations and MRI.
- Genetic Counseling: LZTR1- and SMARCB1-related schwannomatosis are inherited in an autosomal dominant manner with reduced penetrance.

Neurofibromatosis 1 ⁽⁷⁾

Study Design: This study provides a comprehensive review of Neurofibromatosis 1 (NF1), including its clinical characteristics, diagnosis, management, and genetic counseling.

Target Population: Individuals with NF1, a multisystem disorder characterized by multiple café au lait macules, intertriginous freckling, multiple cutaneous neurofibromas, and learning disabilities or behavior problems.

Key Factors:

- Clinical Characteristics: NF1 is associated with various manifestations including optic nerve gliomas, malignant peripheral nerve sheath tumors, scoliosis, and vasculopathy.
- Diagnosis: Established in a proband with two or more characteristic clinical features or one characteristic clinical feature and a heterozygous NF1 pathogenic variant.
- Management: Referral to specialists for treatment of abnormalities, surgical removal of disfiguring neurofibromas, chemotherapy for malignant tumors, and individualized developmental and educational interventions.
- Genetic Counseling: NF1 is inherited in an autosomal dominant manner with a 50% chance of inheritance for each child of an affected individual.

Diagnosis and Management of Opsoclonus-Myoclonus-Ataxia Syndrome in Children ⁽¹⁾

Study Design: This study focuses on the diagnosis, management, and long-term outcomes of Opsoclonus-Myoclonus-Ataxia Syndrome (OMAS) in children.

Target Population: Children presenting with OMAS, typically with onset in the second year of life.

Key Factors:

- **Clinical Presentation:** OMAS presents with characteristic eye movement disorder, myoclonus, ataxia, irritability, and sleep disturbance. Around 50% of cases are associated with neuroblastoma.
- **Diagnosis:** Based on clinical criteria including opsoclonus, ataxia or myoclonus, behavior change or sleep disturbance, and neuroblastoma.
- **Management:** Treatment is largely predicated on immune suppression, with recommendations for monitoring immunotherapy response and long-term follow-up.
- **Long-term Outcomes:** OMAS can be associated with long-term cognitive impairment, and higher intensity of therapy may predict better outcomes

ANALYSIS OF EVIDENCE

Shared Findings ^(1,5,7):

- **Importance of Whole-Body MRI:** All three studies emphasize the importance of whole-body MRI in the surveillance and diagnosis of their respective conditions. Whole-body MRI is considered a valuable tool for detecting tumors and monitoring their growth.
- **High Sensitivity:** Whole-body MRI is highlighted for its high sensitivity in detecting tumors, including those that are not apparent on clinical examination or other imaging modalities.
- **Regular Surveillance:** Regular surveillance using whole-body MRI is recommended in all three studies to monitor the progression of the conditions and detect new tumors.

Conclusion ^(1,5,7):

In summary, while all three articles recognize the importance of whole-body MRI in detecting and monitoring tumors and other abnormalities, they differ in their specific applications and recommendations based on the genetic condition being studied. Whole-body MRI is a critical tool for managing these conditions, providing valuable insights into disease progression and treatment response.

POLICY HISTORY

Date	Summary
June 2025	● Adjusted Summary of Evidence and Analysis of Evidence
May 2025	● Guideline number changed from 063 to 2061 ● Updated genetic imaging to be in line with current literature

Date	Summary
	• Added Combination Studies section • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Adjusted applicable lines of business – Medicare Advantage checked • Added a Summary of Evidence and Analysis of Evidence
May 2024	• Clarified purpose of the guideline • Clarified the frequency and detail on why you would get an unlisted study • Whole Body MRI discussed and refer the user to Bone Marrow MRI guideline • Defined the points in time on when you would get the study • Reduced the background section • Added CPT Codes +0722T and +0698T per Clinical Informatics • Added Contraindications and Preferred Studies section in background

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 7298 for Heart Positron Emission Tomography (PET) with Computed Tomography (CT) for Attenuation

Guideline Number: Evolent_CG_7298	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Indications for determining medical necessity for myocardial perfusion imaging (MPI) with appropriate preference for suitable alternatives, such as stress echocardiography (SE), when more suitable, unless otherwise stated (see [Definitions](#) section).

Indicated when all the criteria for MPI are met **AND** there is likely to be equivocal imaging results because of body mass index (BMI), large breasts or implants, mastectomy, chest wall deformity, pleural or pericardial effusion, or prior thoracic surgery or results of a prior MPI. ^(1,2) **(AUC Score 7)** ⁽³⁾

See Legislative Language for specific mandates in [Washington](#).

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ⁽⁴⁻⁸⁾

INDICATIONS FOR HEART PET WITH CT FOR ATTENUATION ⁽⁹⁾

Suspected Coronary Artery Disease (CAD) ^(10–12)

When neither SE nor MPI have provided or are expected to provide optimal imaging

- **Symptomatic patients without known CAD** (use **Diamond Forrester Table** ^(13,14)) (**AUC Score 9**) ⁽³⁾
 - Intermediate pretest probability and unable to exercise
 - High pretest probability
 - Repeat testing in a patient with new or worsening symptoms and negative result at least one year ago **AND** meets one of the criteria above
- **Asymptomatic patients without known CAD**
 - Previously unevaluated ECG evidence of possible myocardial ischemia including substantial ischemic ST segment or T wave abnormalities (see **Background** section) ⁽¹²⁾
 - Previously unevaluated pathologic Q waves (**AUC Score 6**) ⁽³⁾ (see **Background** section)
 - Unevaluated complete left bundle branch block (**AUC Score 8**) ⁽³⁾

Abnormal Calcium Scores (CAC) ^(3,10)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- STABLE SYMPTOMS with a prior Coronary Calcium Agatston Score of >100. No prior MPI done within the last 12 months (**AUC Score 7**) ⁽¹⁰⁾
- ASYMPTOMATIC high global CAD risk patient with a prior Coronary Calcium Agatston Score of >100. No prior MPI done within the last 12 months ⁽¹⁵⁾
- ASYMPTOMATIC patient with Coronary Calcium Agatston Score > 400 (or a qualitative assessment where 'severe' coronary artery calcification is stated in a report incidentally detected on CT imaging performed for other clinical indications) No prior stress imaging done within the last 12 months) ⁽¹⁶⁾

Inconclusive CAD Evaluation and Obstructive CAD remain a Concern

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- Exercise stress ECG with low-risk Duke treadmill score (≥ 5) (see **Background** section) but patient's current symptoms indicate an intermediate or high pretest probability
- Exercise stress ECG with an intermediate Duke treadmill score (**AUC Score 8**) ⁽³⁾

- Inconclusive/borderline coronary computed tomography angiography (CCTA) or Single Positron Emission Tomography (SPECT) nuclear stress testing (e.g., 40 - 70% lesions) **(AUC Score 8)** ^(3,10)
- Cardiac PET stress-rest perfusion and metabolic activity study (with ¹⁸F-FDG PET) is appropriate in patients with ischemic cardiomyopathy to determine myocardial viability prior to revascularization following an inconclusive SPECT ⁽¹⁰⁾ **(AUC Score 9)** ⁽³⁾
- Non-diagnostic exercise stress test with physical inability to achieve target heart rate (THR)
- An intermediate evaluation by prior stress imaging
- Coronary stenosis of unclear significance on previous coronary angiography ⁽¹⁰⁾ **(AUC Score 8)** ⁽³⁾

Follow-Up Of Patient's Post Coronary Revascularization Percutaneous Coronary Intervention (PCI) or Coronary Artery Bypass Graft (CABG)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging and any of the following ⁽¹⁰⁾:

- **Asymptomatic, follow-up stress imaging** at a minimum of 2 years post coronary artery bypass grafting (CABG), or percutaneous coronary intervention (PCI), (whichever is later), is appropriate only for patients with:
 - High risk: diabetes with accelerated progression of CAD, Chronic Kidney Disease (CKD), peripheral artery disease (PAD), prior brachytherapy, in-stent restenosis (ISR), or saphenous venous graft (SVG) intervention.
 - A history of silent ischemia or
 - A history of a prior left main stent
- For patients with high occupational risk (e.g., associated with public safety, airline and boat pilots, bus and train drivers, bridge and tunnel workers/toll collectors, police officers, and firefighters)

New, recurrent, or worsening symptoms post coronary revascularization are an indication for stress imaging, if it will alter management

Follow-Up Of Known CAD ⁽¹⁰⁾

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Follow-up of asymptomatic or stable symptoms** when last invasive or non-invasive assessment of coronary disease showed hemodynamically significant CAD (ischemia on stress test or FFR ≤ 0.80 or significant stenosis in a major vessel ($\geq 50\%$ left main coronary artery or $\geq 70\%$ left anterior descending (LAD), left circumflex (LCX) or right coronary artery (RCA))), over two years ago, without intervening coronary revascularization is an appropriate indication for stress imaging in patients if it will alter

management

- When there is a change in symptoms or functional capacity that persists despite guideline directed medical therapy ⁽¹¹⁾

Special Diagnostic Conditions Requiring Coronary Evaluation

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Unevaluated Acute Coronary Syndrome**
 - Prior acute coronary syndrome (as documented in MD notes), without subsequent invasive or non-invasive coronary evaluation within the last 12 months
 - Has ventricular wall motion abnormality demonstrated by another imaging modality and myocardial perfusion imaging is being performed to determine if the patient has myocardial ischemia. No imaging stress test within the last 12 months
- **Heart Failure**
 - Newly diagnosed systolic heart failure or diastolic heart failure, with *reasonable suspicion of cardiac ischemia (prior events, risk factors)*, unless invasive coronary angiography is immediately planned or adequate stress imaging has been done within the last 12 months ⁽¹⁰⁾ **(AUC Score 9)** ⁽³⁾
- **Viability**
 - Reduced left ventricular ejection fraction (LVEF) $\leq 50\%$ requiring myocardial viability assessment to assist with decisions regarding coronary revascularization. (Diversion from PET not required when LVEF less than or equal to 40%) **(AUC Score 9)** ⁽³⁾
- **Ischemia and Nonobstructive Coronary Artery Disease (INOCA)**
 - To diagnose microvascular dysfunction in patients with persistent stable anginal chest pain with suspected ischemia and nonobstructive coronary artery disease (INOCA), as documented in provider notes (*no MPI diversion required*).
- **Arrhythmias**
 - Ventricular arrhythmias
 - Sustained ventricular tachycardia (VT) > 100 bpm, ventricular fibrillation (VF), or exercise-induced VT, when invasive coronary arteriography is not the immediately planned test **(AUC Score 7)** ⁽¹⁰⁾
 - Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, frequent premature ventricular contractions (PVC) (defined as greater than or equal to 30/hour on remote monitoring) without known cause or associated cardiac pathology, when an exercise ECG cannot be performed ^(3,10)
- **Anti-arrhythmic Drug Therapy**
 - Class IC antiarrhythmic drug
 - In the intermediate **(AUC Score 6)** ⁽³⁾ and high **(AUC Score 7)** ⁽³⁾ global risk

patient prior to initiation of Class IC antiarrhythmic drug initiation (Propafenone or Flecainide) (**AUC Score 7**) ⁽¹⁰⁾

- Annually for intermediate and high global risk patients taking Class IC antiarrhythmic drug (Propafenone or Flecainide) (**AUC Score 7**) ⁽³⁾

- **Coronary Anomaly and Aneurism**

- Assessment of hemodynamic significance of one of the following documented conditions:
 - Anomalous coronary arteries ⁽¹⁷⁾ (**AUC Score 7**) ⁽³⁾
 - Muscle bridging of coronary artery ⁽¹⁸⁾
- Coronary aneurysms in Kawasaki's disease ⁽¹⁹⁾ (**AUC Score 8**) ⁽³⁾ or due to atherosclerosis

- **Radiation**

- Following radiation therapy to the anterior or left chest, at 5 years post initiation and every 5 years thereafter ⁽²⁰⁾

- **Cardiac Sarcoidosis**

- May be approved as a combination study with MPI for the evaluation and treatment of sarcoidosis ^(3,21)
 - Evaluation and therapy monitoring in patients with sarcoidosis, after documentation of suspected cardiac involvement by echo or ECG, when cardiac magnetic resonance imaging (CMR) has not been performed
 - Evaluation of suspected cardiac sarcoid, after CMR has shown equivocal or negative findings in the setting of a high clinical suspicion
 - Evaluation of CMR findings showing highly probable cardiac sarcoidosis, when PET could serve to identify inflammation and the consequent potential role for immunosuppressive therapy ⁽²²⁾ (**AUC Score 9**) ⁽³⁾
 - Initial and follow-up PET in monitoring therapy for cardiac sarcoid with immunosuppressive therapy, typically about 4 times over 2 years

- **Infective Endocarditis**

- In suspected infective endocarditis with moderate to high probability (i.e., staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device), when transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) have been inconclusive with respect to diagnosis of infective endocarditis or characterization of paravalvular invasive complications ⁽²³⁾

- **Aortitis**

- For diagnosis and surveillance of Aortitis, PET/CT or PET/MRI hybrid imaging ⁽²⁴⁾
- **NOTE:** If PET/MRI study is requested, there is no specific CPT Code for this imaging study and a Health Plan review will be required. study is requested, there is no specific CPT Code for this imaging study and a Health Plan review will be required.

Prior To Elective Non-Cardiac Surgery

When neither SE nor MPI have provided or are expected to provide optimal imaging

- An intermediate or high-risk surgery with one or more risk factors (see below), **AND** documentation of an inability to walk (or < 4 METs) **AND** there has not been an imaging stress test within 1 year ^(25–28)
 - **Risk factors:** history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine > 2.0 mg/dL.
 - **Surgical Risk:**
 - **High risk surgery:** Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - **Intermediate risk surgery:** Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery
 - **Low risk surgery:** Endoscopic procedures, superficial procedure, cataract surgery, breast surgery
- Planning for any organ or stem cell transplantation is an indication for preoperative stress imaging, if there has not been a conclusive stress evaluation, computed tomography angiography (CTA), or heart catheterization within the past year, at the discretion of the transplant service ⁽²⁹⁾

Post Cardiac Transplant

- Annually, for the first five years post cardiac transplantation, in a patient not undergoing invasive coronary arteriography ⁽³⁰⁾

LEGISLATIVE REQUIREMENTS

Washington

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease ⁽³¹⁾

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
 - Adult patients with known CAD who have new or worsening symptoms.
- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

CODING AND STANDARDS

Codes

78429, 78430, 78431, 78432, 78433, +78434, 78459, 78472, 78491, 78492, 93015, 93016, 93017, 93018, A9555

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

General Overview ^(1,2)

A PET study is a diagnostic test used to evaluate blood flow to the heart. During the test, a small amount of radioactive tracer is injected into a vein. A special camera, called a gamma camera, detects the radiation released by the tracer to produce computer images of the heart. Combined with a medication, the test can help determine if there is adequate blood flow to the heart during activity versus at rest. The medication simulates exercise for patients unable to exercise on a treadmill or stationary cycle.

PET perfusion studies illustrate myocardial blood flow by demonstrating tracer uptake. PET metabolic evaluation studies are used to demonstrate inflammation produced by infiltrative disease such as sarcoidosis, but also enhance the detection of viable (hibernating) myocardium. Hybrid PET-CT scanning combines anatomical information with blood flow assessment and is useful for assessing viable myocardium, especially in chronic heart failure patients with global ischemia, or in patients with multivessel diffuse coronary artery disease as opposed to focal stenotic lesions.

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁵⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Definitions

- Stable patients without known CAD fall into 2 categories ^(3,10,11):
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section).
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant CAD (below):
- The THREE Types of Chest Pain or Discomfort
 - **Typical Angina (Definite)** is defined as including all **3** characteristics:
 - Substernal chest pain or discomfort with characteristic quality and duration
 - Provoked by exertion or emotional stress
 - Relieved by rest and/or nitroglycerine
 - **Atypical Angina (Probable)** has only **2** of the above characteristics

- **Nonanginal Chest Pain/Discomfort** has only **0 - 1** of the above characteristics
- The medical record should provide enough detail to establish the type of chest pain. From those details, the pretest probability of obstructive CAD is estimated from the Diamond Forrester Table below, recognizing that in some cases multiple additional coronary risk factors could increase pretest probability ^(3,10,11):

Diamond Forrester Table ^(13,14)

Age (Years)	Gender	Typical/ Definite Angina Pectoris	Atypical/ Probable Angina Pectoris	Nonanginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40-49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50-59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very low: < 5% pretest probability of CAD, usually not requiring stress evaluation

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- An uninterpretable baseline ECG includes ⁽¹¹⁾:
 - ST segment depression 1 mm or more; (not for non-specific ST- T wave changes)
 - Ischemic looking T waves; at least 2.5 mm inversions (excluding V1 and V2)
 - Bundle Branch Blocks (BBB)
 - Left BBB
 - Right BBB or intraventricular conduction delay (IVCD), either containing ST or T wave abnormalities (see above)
 - Left ventricular hypertrophy (LVH) with repolarization abnormalities
 - Ventricular paced rhythm
 - Digitalis use with associated ST segment abnormalities

- Resting HR under 50 bpm on a medication, such as beta-blockers or calcium channel blockers, that is required for patient's treatment and cannot be stopped, with an anticipated suboptimal workload
- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - 40 ms (1 mm) wide
 - 2 mm deep
 - 25% of depth of QRS complex
- ECG Stress Test Alone versus Stress Testing with Imaging
 - Prominent scenarios suitable for an ECG stress test **WITHOUT** imaging (i.e., exercise treadmill ECG test) require that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise ⁽¹⁰⁾:
 - The (symptomatic) low or intermediate pretest probability patient who can exercise and has an interpretable ECG ⁽¹⁰⁾
 - The patient who is under evaluation for exercise-induced arrhythmia
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - For the evaluation of syncope or presyncope during exertion ⁽³²⁾
- Duke Exercise ECG Treadmill Score ⁽³³⁾
 - Calculates risk from ECG treadmill alone:
 - The equation for calculating the Duke treadmill score (DTS) is: DTS = exercise time in minutes - (5 x ST deviation in mm or 0.1 mV increments) - (4 x exercise angina score), with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting
 - The score typically ranges from - 25 to + 15. These values correspond to low-risk (with a score of $\geq + 5$), intermediate risk (with scores ranging from - 10 to + 4), and high-risk (with a score of $\leq - 11$) categories
- Coronary application of PET includes evaluation of stable patients without known CAD, who fall into two categories ^(3,10,11)
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section).
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant ($\geq 50\%$) CAD (below)
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known

cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years. **High global risk by itself generally lacks scientific support as an indication for stress imaging.** There are rare exceptions, such as patients requiring IC antiarrhythmic drugs who might require coronary risk stratification prior to initiation of the drug.

■ **CAD Risk—Low**

- 10-year absolute coronary or cardiovascular risk less than 10%

■ **CAD Risk—Moderate**

- 10-year absolute coronary or cardiovascular risk between 10% and 20%

■ **CAD Risk—High**

- 10-year absolute coronary or cardiovascular risk of greater than 20%

Websites for Global Cardiovascular Risk Calculators* (34–38)

Risk Calculator	Websites for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

- Definitions of Coronary Artery Disease ⁽¹¹⁾
 - Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).
 - Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. Its incorporation into global risk can be achieved by using the Multi-Ethnic Study of Atherosclerosis (MESA) risk calculator.
 - Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate) generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69%
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum lumen cross-sectional area on IVUS ≤ 6 square mm ^(11,39)
 - FFR (fractional flow reserve) ≤ 0.80 for a major vessel ⁽³⁹⁾
 - Demonstrable ischemic findings on stress testing (ECG or stress imaging), that are at least mild in degree
 - A major vessel would be a coronary vessel that would be amenable to revascularization if indicated. This assessment is made based on the diameter of the vessel and/or the extent of myocardial territory served by the vessel.
 - FFR (fractional flow reserve) is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow.
 - Newer technology that estimates FFR from CCTA image is covered under the Evolent Clinical Guideline 7293 for Fractional Flow Reserve CT.
- Anginal Equivalent ^(11,32)
 - Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons to suspect that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia), by presentation of clinical data, such as respiratory rate, oximetry, lung exam, etc. (as well as d-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Most syncope per se is not an anginal equivalent.

Acronyms/Abbreviations

ADLs: Activities of daily living

BMI: Body mass index

CABG: Coronary artery bypass grafting
CAC: Coronary artery calcium
CAD: Coronary artery disease
CCTA: Coronary computed tomography angiography
CMR: Cardiac magnetic resonance imaging
CT(A): Computed tomography (angiography)
DTS: Duke Treadmill Score
ECG: Electrocardiogram
FFR: Fractional flow reserve
IVUS: Intravascular ultrasound
LBBB: Left bundle-branch block
LVEF: Left ventricular ejection fraction
LVH: Left ventricular hypertrophy
MESA: Multi-Ethnic Study of Atherosclerosis
MET: Estimated metabolic equivalent of exercise
MI: Myocardial infarction
MPI: Myocardial perfusion imaging
MR(I): Magnetic resonance (imaging)
PCI: Percutaneous coronary intervention
PET: Positron emission tomography
PFT: Pulmonary function test
PVCs: Premature ventricular contractions
SE: Stress echocardiography
TEE: Transesophageal echocardiography
THR: Target heart rate
TTE: Transthoracic echocardiography
VF: Ventricular fibrillation
VT: Ventricular tachycardia
WPW: Wolff-Parkinson-White

SUMMARY OF EVIDENCE

American Society of Nuclear Cardiology and Society of Nuclear Medicine and Molecular Imaging Joint Position Statement on the Clinical Indications for Myocardial Perfusion PET ⁽¹⁾

Study Design: The document is a joint position statement that summarizes the properties and clinical indications of myocardial perfusion PET. It is based on extensive clinical investigations and meta-analyses that demonstrate the advantages of PET over other noninvasive cardiac imaging modalities.

Target Population: The target population includes patients with known or suspected coronary artery disease (CAD) who meet appropriate criteria for a stress imaging test. This includes:

- Patients unable to complete a diagnostic-level exercise stress imaging study.
- Patients with prior stress imaging studies of poor quality or inconclusive results.
- High-risk patients, such as those with chronic kidney disease, diabetes mellitus, or suspected high-risk CAD.
- Young patients with established CAD who require repeated radiation-associated cardiac imaging procedures.

Key Factors:

1. **High Diagnostic Accuracy:** Myocardial perfusion PET has high sensitivity and specificity for detecting obstructive CAD, outperforming other noninvasive approaches.
2. **Consistent High-Quality Images:** PET images have high myocardial counts, spatial and contrast resolution, and accurate correction for tissue attenuation and scatter.
3. **Low Radiation Exposure:** PET scans expose patients to less than 5 mSv, significantly lower than other radiation-based cardiac assessments.
4. **Short Acquisition Protocols:** Complete rest-stress studies can be acquired in less than one hour, making it convenient for acutely ill or high-risk patients.
5. **Quantification of Myocardial Blood Flow:** PET allows for the measurement of myocardial flow reserve, improving interpretation confidence and patient selection for interventions.
6. **Strong Prognostic Power:** PET provides high discrimination between different levels of risk in all patient populations, including obese and non-obese individuals, men and women, diabetics, and patients with renal dysfunction.

Appropriate Use Criteria for PET Myocardial Perfusion Imaging ⁽³⁾

Study Design: The document is a consensus guideline developed by a multidisciplinary workgroup representing several medical specialty societies. It is based on a systematic review of the literature, expert opinion, and clinical practice guidelines. The study design includes the development of clinical scenarios, systematic synthesis of available evidence, individual and group ratings of clinical indications, and recommendations based on final group ratings and discussions.

Target Population: The target population includes patients with suspected or known coronary artery disease (CAD), asymptomatic patients, patients with diagnosed heart failure, patients with known or suspected cardiac sarcoidosis, patients with arrhythmias, patients with syncope, patients with coronary microvascular disease (CMD), specific populations such as those with advanced obesity or familial hypercholesterolemia, patients undergoing prior testing or procedures, patients undergoing preoperative evaluation for noncardiac surgery, and patients requiring determination of exercise level before initiation of exercise prescription or cardiac rehabilitation.

Key Factors

1. **Appropriate Use Criteria (AUC):** The document outlines AUC for PET MPI in 11 sections, covering various clinical scenarios and patient populations.
2. **Diagnostic and Prognostic Value:** PET MPI is highlighted for its high diagnostic accuracy, sensitivity, and specificity in detecting CAD and CMD. It provides incremental prognostic information that affects clinical decision-making and treatment options.
3. **Clinical Scenarios:** The document includes detailed clinical scenarios with appropriateness scores, ranging from rarely appropriate to appropriate, based on the likelihood of PET MPI affecting clinical management and outcomes.
4. **Methodology:** The AUC development process follows the RAND/UCLA Appropriateness Method, including systematic review, evidence synthesis, individual and group ratings, and consensus recommendations.
5. **Outcome Data:** The document emphasizes the importance of outcome data in guiding the use of PET MPI, particularly in high-risk populations and specific clinical contexts.

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease ⁽¹⁰⁾

Study Design: The study is a report by the American College of Cardiology (ACC) Solution Set Oversight Committee, in collaboration with several other cardiovascular societies. It updates the prior AUC for various cardiovascular imaging modalities, including radionuclide imaging, stress echocardiography, calcium scoring, coronary computed tomography angiography (CCTA), stress cardiac magnetic resonance (CMR), and invasive coronary angiography.

Target Population: The target population includes patients with known or suspected CCD, which encompasses stable ischemic heart disease (SIHD). The clinical scenarios cover both symptomatic and asymptomatic patients, with and without prior testing or revascularization.

Key Factors:

Clinical Scenarios: The document outlines 64 clinical scenarios for the detection and risk assessment of CCD, drawn from common applications and current clinical practice guidelines.

Rating Process: The clinical scenarios were rated by an independent panel using a modified Delphi process. Ratings were categorized as Appropriate (7-9), May Be Appropriate (4-6), or Rarely Appropriate (1-3).

Updates and Changes: Key changes include the removal of preoperative testing scenarios, simplification of clinical scenario tables, and incorporation of new evidence and guidelines.

Assumptions: The study assumes that each test is performed and interpreted by trained professionals, and that patients are receiving optimal standard care.

Advantages and Limitations: The document provides a table outlining the advantages and limitations of various imaging modalities, such as echocardiography, SPECT, PET, CMR, CCTA, and invasive angiography.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,3,10):

1. **Importance of PET MPI:** All three articles emphasize the significance of PET myocardial perfusion imaging (MPI) in diagnosing and managing coronary artery disease (CAD). They highlight its high diagnostic accuracy, ability to quantify myocardial blood flow, and prognostic value.
2. **Diagnostic Accuracy:** The articles agree on the high sensitivity and specificity of PET MPI for detecting obstructive CAD. They also note its superiority over other noninvasive imaging modalities in certain clinical scenarios.
3. **Prognostic Value:** The prognostic power of PET MPI is a common theme. The ability to predict future cardiovascular events and guide clinical decision-making is emphasized across all three studies.
4. **Clinical Utility:** The articles discuss the clinical utility of PET MPI in various patient populations, including those with suspected or known CAD, heart failure, and other cardiovascular conditions.

POLICY HISTORY

Date	Summary
July 2025	• This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7298-01 for Heart PET with CT for Attenuation and ECG 079 for Heart PET with CT for Attenuation into Evolent Clinical Guideline 7298 for Heart Positron Emission Tomography (PET) with Computed Tomography (CT) for Attenuation ◦ This guideline also merges Procedure Codes from these two Evolent guidelines • Added new bullet-point to the General Statement section • Checked the Medicare Advantage box in the Applicable Lines of

Date	Summary
	Business table Added a Summary of Evidence and Analysis of Evidence

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 7312 for Myocardial Perfusion Imaging (MPI)

Guideline Number: Evolent_CG_7312	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Medical necessity for myocardial perfusion imaging (MPI) will consider the preference for appropriate alternatives, such as stress echocardiography (SE), when deemed more suitable, unless contraindications are present (see **DEFINITIONS** section). Preference toward stress echocardiography will be denoted by 

See legislative language for specific mandates in **Washington** State.

When a noncardiac explanation is provided for symptoms, no testing is required (**AUC Score 8**)⁽¹⁾

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care.⁽²⁻⁶⁾

INDICATIONS FOR MPI (1,7–10)

Suspected Coronary Artery Disease (CAD)

- **Symptomatic patients without known CAD. No imaging stress test within the last 12 months.** *The terms "typical," "atypical," and "non-anginal symptoms" can still be observed in medical records (consult the Diamond Forrester table in the Definitions section). However, the American College of Cardiology (ACC) has simplified its terminology to "Less likely anginal symptoms" and "Likely anginal symptoms" (refer to definitions) and utilized below.*
 - Less likely anginal symptoms **(AUC Score 6)** ⁽¹⁾
 - When a patient cannot walk a treadmill
 - When baseline EKG makes standard exercise test inaccurate (see Definitions section). ^(SE)
 - Likely Anginal Symptoms (typical angina) ⁽¹⁾
 - < 50 years old with ≤ one risk factor if an ECG treadmill test cannot be done.
AUC scores for this bullet point are identical for MPI, stress echo, and ETT **(AUC Score 7). Although the ACC guideline does not specify youth and gender, decisions should be guided by best medical judgment, considering factors such as safety and radiation exposure.
 - ≥ 50 years old **(AUC Score 8)** ⁽¹⁾
 - Repeat testing in a patient with new or worsening symptoms **AND** negative result at least one year prior **AND** meets one of the criteria above ^(SE)
- **Asymptomatic patients without known CAD (AUC Score 7)** ⁽¹⁾
 - A pharmacologic MPI is indicated for those unable to exercise with previously unevaluated ECG evidence of possible myocardial ischemia including ischemic ST segment or T wave abnormalities (see DEFINITIONS section).
 - Previously unevaluated pathologic Q waves (see DEFINITIONS section)
 - Previously unevaluated complete left bundle branch block

Abnormal Calcium Scores (1,11–14)

- STABLE SYMPTOMS with a prior Coronary Calcium Agatston Score of >100. No prior stress imaging done within the last 12 months **(AUC Score 7)** ⁽¹⁾ ^(SE)
- ASYMPTOMATIC high global CAD risk patient with a prior Coronary Calcium Agatston Score of >100. No prior stress imaging done within the last 12 months ^(SE)
- ASYMPTOMATIC patient with Coronary Calcium Agatston Score > 400 (or a qualitative assessment where 'severe' coronary artery calcification is stated in a report incidentally detected on CT imaging performed for other clinical indications). No prior stress imaging done within the last 12 months ⁽¹⁵⁾ ^(SE)

Inconclusive CAD Evaluation and Obstructive CAD

REMAINS A CONCERN:

- Exercise stress ECG with low-risk Duke treadmill score (≥ 5), (see **DEFINITIONS** section) but patient's current symptoms indicate increasing likelihood of disease (**AUC score 8**) ⁽¹⁾
- Exercise stress ECG with an intermediate Duke treadmill score ^{SE} (*of note, SE diversion is not required for symptoms consistent with likely anginal symptoms*)
- Intermediate coronary computed tomography angiography (CCTA) (40 - 70% lesions) performed less than 90 days ago. (**AUC Score 7**) ⁽¹⁾
- Non-diagnostic exercise stress test with inability to achieve target heart rate (THR) defined as greater than 85% age predicted maximal heart rate by physiologic exercise
- An indeterminate (equivocal, borderline, or discordant) evaluation by prior stress imaging (SE or CMR) within the last 12 months
- Coronary stenosis of unclear significance on previous coronary angiography not previously evaluated ⁽¹⁾

Follow-Up of Patient's Post Coronary Revascularization (PCI or CABG) ⁽¹⁾

Any ONE of the following:

- **Asymptomatic follow-up stress imaging** at a minimum of 2 years post coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) (whichever is later) is appropriate for patients with: (**AUC Score 6**) ⁽¹⁾ ^{SE} (*of note, SE diversion is not required for post CABG patients*)
 - **High risk:** diabetes with accelerated progression of CAD, chronic kidney disease (CKD), peripheral artery disease (PAD), prior brachytherapy, in-stent restenosis (ISR), or saphenous venous graft (SVG) intervention.
 - A history of silent ischemia or
 - A history of a prior left main stent
- For patients with high occupational risk, associated with public safety, airline and boat pilots, bus and train drivers, bridge and tunnel workers/toll collectors, police officers and firefighters ^{SE} (*of note, SE diversion not required for post-CABG patients*)
- **New, recurrent, or worsening symptoms, treated medically or by revascularization** is an indication for stress imaging, if it will alter management for typical anginal symptoms or symptoms documented to be similar to those prior to revascularization if no imaging stress test within the last 12 months. (**AUC Score 8**) ^(1,16)

Follow-Up of Known CAD

- **Follow-up of asymptomatic or stable symptoms** when last invasive or non-invasive

assessment of coronary disease showed hemodynamically significant CAD (ischemia on stress test or fractional flow reserve (FFR) ≤ 0.80 or significant stenosis in a major vessel ($\geq 50\%$ left main coronary artery or $\geq 70\%$ left-anterior descending (LAD), left circumflex (LCX), right coronary artery (RCA))), over two years ago, without intervening coronary revascularization is an appropriate indication for stress imaging in patients if it will alter management. **SE** ⁽¹⁾

Special Diagnostic Conditions Requiring Coronary Evaluation

Unevaluated Acute Coronary Syndrome

- Prior acute coronary syndrome (with documentation in MD notes), without invasive or non-invasive coronary evaluation within last 12 months
- Has ventricular wall motion abnormality demonstrated by another imaging modality and myocardial perfusion imaging is being performed to determine if the patient has myocardial ischemia. No imaging stress test within the last 12 months

Heart Failure

- Newly diagnosed systolic heart failure or diastolic heart failure, *with reasonable suspicion of cardiac ischemia (prior events, risk factors)*, unless invasive coronary angiography is immediately planned. ^(8,17–19) No imaging stress test done within the last 12 months.

Viability

- Left ventricular ejection fraction (LVEF) requiring myocardial viability assessment to assist with decisions regarding coronary revascularization **(AUC Score 9)** ^(1,16)

Suboptimal Revascularization

- MPI is being done to evaluate the effectiveness of the intervention in a high-risk patient who has undergone cardiovascular re-perfusion (CABG or Percutaneous Coronary Intervention, PCI) with suboptimal and/or incomplete revascularization results. No imaging stress test has been done within the last 12 months. **(AUC Score 7)** ^(1,16)

Arrhythmias

- Ventricular arrhythmias **(AUC Score 7)** ⁽¹⁾
 - Sustained ventricular tachycardia (VT) > 100 bpm, ventricular fibrillation (VF), or exercise-induced VT, when invasive coronary arteriography is not immediately planned ⁽²⁰⁾
 - Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, or frequent premature ventricular contractions (PVC) (defined as greater than or equal to 30/hour on remote monitoring) without known cause or associated cardiac pathology, when an exercise ECG cannot be performed ⁽²¹⁾

Anti-Arrhythmic Drug Therapy

- Class IC antiarrhythmic drug
 - In the intermediate and high global risk patient prior to initiation of Class IC antiarrhythmic drug initiation (Propafenone or Flecainide)
 - Annually in intermediate and high global risk patients taking Class IC antiarrhythmic drug (Propafenone or Flecainide) ⁽²²⁾

Coronary Anomaly and Aneurism

- Assessment of hemodynamic significance of one of the following documented conditions:
 - Anomalous coronary arteries ⁽²³⁾
 - Myocardial bridging of coronary artery ⁽²⁴⁾
- Coronary aneurysms in Kawasaki's disease ⁽²⁵⁾ or due to atherosclerosis

Radiation and Chemotherapy SE

- Following radiation therapy to the anterior or left chest, at 5 years post initiation and every 5 years thereafter ⁽²⁶⁾

Sarcoidosis and Amyloidosis (PYP study)

- Cardiac sarcoidosis: as a combination study with Heart PET for the evaluation and treatment of cardiac sarcoidosis ⁽²⁷⁾
- Cardiac amyloidosis: for the diagnosis of cardiac transthyretin amyloidosis (ATTR)

***Not** to be used for the diagnosis of cardiac light chain amyloidosis (AL) ⁽²⁸⁾

Prior To Elective Non-Cardiac Surgery In Asymptomatic Patient

- An intermediate or high-risk surgery with of one or more risk factors (see below), AND documentation of an inability to walk (or <4 METs) AND there has not been an imaging stress test within 1 year ^(29–31)
 - **Risk factors:** history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine >2.0 mg/dL
 - **Surgical Risk:**
 - **High risk surgery:** Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - **Intermediate risk surgery:** Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery

- **Low risk surgery:** Endoscopic procedures, superficial procedure, cataract surgery, breast surgery
- Planning for any organ or stem cell transplantation is an indication for preoperative MPI, if there has not been a conclusive stress evaluation, computed tomography angiography (CTA), or heart catheterization within the past year, at the discretion of the transplant service. ^(32,33)

Post Cardiac Transplant (SE Diversion Not Required)

- Annually, for the first five years post cardiac transplantation, in a patient not undergoing invasive coronary arteriography

LEGISLATIVE LANGUAGE

Washington

20211105A - Noninvasive Cardiac Imaging for Coronary Artery Disease ⁽³⁴⁾

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
 - Symptomatic adult patients (≥18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
 - Adult patients with known CAD who have new or worsening symptoms.
- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥18 years of age) at intermediate or high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.

- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

CODING AND STANDARDS

Codes

78451, 78452, 78453, 78454, 78466, 78468, 78469, 78481, 78483, 78499, 93015, 93016, 93017, 93018, +0742T, A9500, A9502, A9505, J0153, J1245, J2785

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Myocardial perfusion imaging is used primarily for the evaluation of coronary artery disease and determining prognosis. Myocardial perfusion imaging is a cardiac radionuclide imaging procedure that evaluates blood flow to the cardiac muscle during rest or stress. Stress may be provided by exercise or with pharmacologic agents. A variety of radionuclides may be used, including Technetium tc-99M sestamibi, thallium201 and Technetiumtc-99M tetrofosmin.

For those patients who are unable to complete the exercise protocol without achieving >85% of predicted maximal heart rate, a pharmacological nuclear stress test is recommended. This testing method uses a drug to mimic the response of the cardiovascular system to exercise. Adenosine, Persantine, Dobutamine, or Regadenoson are vasodilators used in pharmacological nuclear stress testing. A gamma camera is used to record images in planar or tomographic (single photon emission computed tomography, SPECT) projections.

High global CAD risk is defined as 10-year CAD risk of >20%. CAD equivalents (e.g., DM, PAD) can also define high risk.

10-year CAD risk (%) is defined based on the risk factors- Sex, Age, Race, Total Cholesterol, HDL Cholesterol, Systolic Blood Pressure, and Treatment for High Blood Pressure, Diabetes Mellitus, and Smoker.

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽³⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Definitions

- Stable patients without known CAD fall into 2 categories ^(1,8,9):
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see **Websites for Global Cardiovascular Risk Calculators** section).
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant CAD (below):
- The medical record should provide enough detail to establish the type of chest pain:
 - **Likely Anginal symptoms** encompass chest/epigastric/shoulder/arm/jaw pain, chest pressure/discomfort occurring with exertion or emotional stress and relieved by rest, nitroglycerine or both.
 - **Less-Likely Anginal symptoms** include dyspnea, or fatigue not relieved by rest/nitroglycerin, as well as generalized fatigue or chest discomfort with a time course not indicative of angina (e.g., resolving spontaneously within seconds or lasting for an extended period unrelated to exertion).
- **Risk Factors for Coronary disease include (but not limited to)**: diabetes mellitus, smoking, family history of premature CAD (men age less than 55, females less than 65), hypertension, dyslipidemia.
- Beginning 2023, the classification terms for angina were updated within the ACC's Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease to **Less Likely Anginal Symptoms** and **Likely Anginal Symptoms** as in #2. Previously, the document referred to "Typical Angina", "Atypical Angina" and "Non-Anginal" symptoms, defined by the **Diamond Forrester Table**. We still provide this information for your reference ^(1,8,9):

Diamond Forrester Table ^(35,36)

Age (Years)	Gender	Typical/Definite Angina Pectoris	Atypical/Probable Angina Pectoris	Nonanginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40-49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50-59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very low: < 5% pretest probability of CAD, usually not requiring stress evaluation; **Low:** 5 - 10% pretest probability of CAD; **Intermediate:** 10% - 90% pretest probability of CAD; **High:** > 90% pretest probability of CAD

- An uninterpretable baseline ECG includes ⁽⁸⁾:
 - ST segment depression is considered significant when there is 1 mm or more, not for non-specific ST - T wave changes
 - Ischemic looking T waves are considered significant when there are at least 2.5 mm inversions (excluding V1 and V2)
 - Bundle Branch Blocks (BBB)
 - Left BBB
 - Right BBB or intraventricular conduction delay (IVCD), containing ST or T wave abnormalities
 - LVH with repolarization abnormalities
 - Ventricular paced rhythm
 - Digitalis use with associated ST segment abnormalities
 - Resting HR under 50 bpm on a medication, such as beta-blockers or calcium channel blockers, that is required for patient's treatment and cannot be stopped, with an anticipated suboptimal workload
- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - 40 ms (1 mm) wide

- 2 mm deep
- 25% of depth of QRS complex
- ECG Stress Test Alone versus Stress Testing with Imaging
- Prominent scenarios suitable for an ECG stress test WITHOUT imaging (i.e., exercise treadmill ECG test) require that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise ⁽¹⁾:
 - The (symptomatic) low or intermediate pretest probability patient who can exercise and has an interpretable ECG ⁽¹⁾
 - The patient who is under evaluation for exercise-induced arrhythmia
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - For the evaluation of syncope or presyncope during exertion ⁽³⁷⁾
 - When exercise cannot be performed, pharmacologic stress can be considered.
- Duke Exercise ECG Treadmill Score ⁽³⁸⁾
 - Calculates risk from ECG treadmill alone:
 - The equation for calculating the Duke treadmill score (DTS) is: $DTS = \text{exercise time in minutes} - (5 \times \text{ST deviation in mm or } 0.1 \text{ mV increments}) - (4 \times \text{exercise angina score})$, with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting
 - The score typically ranges from - 25 to + 15. These values correspond to low-risk (with a score of $\geq + 5$), intermediate risk (with scores ranging from - 10 to + 4), and high-risk (with a score of $\leq - 11$) categories
- MPI may be performed without diversion to a SE in any of the following ^(1,39):
 - Inability to Exercise
 - Physical limitations precluding ability to exercise for at least 3 full minutes of Bruce protocol
 - Limited functional capacity (< 4 METS) **such as one** of the following:
 - Unable to take care of their ADLs or ambulate
 - Unable to walk 2 blocks on level ground
 - Unable to climb 1 flight of stairs
 - Other Comorbidities
 - Severe chronic obstructive pulmonary disease (COPD) with pulmonary function test (PFT) documentation, severe shortness of breath on minimal exertion, or requirement of home oxygen during the day
 - Poorly controlled hypertension, with systolic BP > 180 or diastolic BP > 120 (and clinical urgency not to delay MPI)

- ECG and Echo-Related Baseline Findings
 - Prior cardiac surgery (coronary artery bypass graft or valvular)
 - Documented poor acoustic imaging window
 - Left ventricular ejection fraction $\leq 40\%$
 - Pacemaker or ICD
 - Persistent atrial fibrillation
 - Resting wall motion abnormalities that would make SE interpretation difficult
 - Complete left bundle branch block (LBBB)
- Risk-Related scenarios
 - High pretest probability in suspected CAD
 - Intermediate or high global risk in patients requiring type IC antiarrhythmic drugs (prior to initiation of therapy and annually)
 - Arrhythmia risk with exercise
 - Previously unevaluated pathologic Q waves (in two contiguous leads)
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years.
 - **CAD Risk—Low**
10-year absolute coronary or cardiovascular risk less than 10%.
 - **CAD Risk—Moderate**
10-year absolute coronary or cardiovascular risk between 10% and 20%.
 - **CAD Risk—High**
10-year absolute coronary or cardiovascular risk of greater than 20%.

Websites for Global Cardiovascular Risk Calculators* (40–44)

Risk Calculator	Websites for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/

Risk Calculator	Websites for Online Calculator
Pooled Cohort Equation	http://clinicalcalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

Definitions ^(8,9,13,45)

- Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).
- Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. Its incorporation into global risk can be achieved by using the MESA risk calculator.
- Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate) generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69% ⁽¹⁾
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ ^(8,45,46)
 - FFR (fractional flow reserve) ≤ 0.80 for a major vessel ^(45,46)
 - Demonstrable ischemic findings on stress testing (ECG or stress imaging), that are at least mild in degree
- FFR (fractional flow reserve) is the distal to proximal pressure ratio across a coronary lesion. Less than or equal to 0.80 is considered a significant reduction in coronary flow.

Anginal Equivalent ^(8,37)

- Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons to suspect that symptoms other than chest discomfort are not

due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia). This may include respiratory rate, oximetry, lung exam, etc. (as well as d-dimer, chest CT(A), and/or pulmonary function tests (PFT), when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Syncope per se is not an anginal equivalent.

Acronyms / Abbreviations

ADLs: Activities of daily living
BSA: Body surface area in square meters
CABG: Coronary artery bypass grafting
CAD: Coronary artery disease
CMR: Cardiac magnetic resonance imaging
CTA: Computed tomography angiography
ECG: Electrocardiogram
FFR: Fractional flow reserve
IVUS: Intravascular ultrasound
LBBB: Left bundle-branch block
LVEF: Left ventricular ejection fraction
LVH: Left ventricular hypertrophy
MI: Myocardial infarction
MET: Estimated metabolic equivalent of exercise
MPI: Myocardial perfusion imaging
PCI: Percutaneous coronary intervention
PFT: Pulmonary function test
PVCs: Premature ventricular contractions
SE: Stress echocardiography
THR: Target heart rate
VT: Ventricular tachycardia
VF: Ventricular fibrillation
WPW: Wolf Parkinson White

SUMMARY OF EVIDENCE

2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease ⁽⁸⁾

Study Design: The guideline is based on a comprehensive literature search conducted from September 2021 to May 2022. The search included clinical studies, systematic reviews, meta-analyses, and other evidence conducted on human participants. The databases used for the search included MEDLINE (through PubMed), EMBASE, the Cochrane Library, and the Agency for Healthcare Research and Quality. The guideline was developed by the American Heart Association (AHA) and the American College of Cardiology (ACC) Joint Committee on Clinical Practice Guidelines, in collaboration with and endorsed by several other professional organizations.

Target Population: The guideline is intended for clinicians in primary care and cardiology specialties who care for patients with CCD in the outpatient setting. The target population includes patients with chronic coronary disease, which encompasses a heterogeneous group of conditions such as obstructive and nonobstructive coronary artery disease (CAD) with or without previous myocardial infarction (MI) or revascularization, ischemic heart disease diagnosed only by noninvasive testing, and chronic angina syndromes with varying underlying causes.

Key Factors:

Epidemiology and General Principles: The guideline addresses the prevalence of CCD, which varies by age, sex, race, ethnicity, and geographic region. It also highlights the role of social determinants of health in both risk and outcomes from CCD.

Evaluation, Diagnosis, and Risk Stratification: The guideline recommends the use of stress testing, invasive coronary angiography, and other diagnostic tools to assess the presence and extent of myocardial ischemia and guide therapeutic decision-making.

Treatment: The guideline emphasizes a patient-centered approach to treatment, incorporating shared decision-making, social determinants of health, and team-based care. It includes recommendations for lifestyle modifications, pharmacologic therapies, and revascularization.

Special Populations: The guideline provides specific recommendations for managing CCD in special populations, including patients with heart failure, valvular heart disease, young adults, cancer, women (including pregnancy and postmenopausal hormone therapy), older adults, chronic kidney disease, HIV, autoimmune disorders, and heart transplant recipients.

Patient Follow-Up: The guideline recommends regular follow-up to assess symptoms, functional status, adherence to lifestyle and medical interventions, and monitoring for complications of CCD and its treatments.

Cost and Value Considerations: The guideline includes recommendations for discussing out-of-pocket costs with patients to preempt cost-related nonadherence and ensure access to effective therapies.

2024 ESC Guidelines for the management of chronic coronary syndromes ⁽⁹⁾

Study Design: The guidelines were developed through a comprehensive review and evaluation

of the published literature on diagnostic and therapeutic approaches for chronic coronary syndromes. The task force performed a critical review of the scientific and medical knowledge available at the time of publication. The strength of each recommendation and the level of evidence supporting them were weighed and scored according to predefined scales. The guidelines were subject to multiple rounds of double-blind peer review by external experts, including members from across the ESC region, all National Cardiac Societies of the ESC, and relevant ESC subspecialty communities.

Target Population: The guidelines are intended for use by health professionals involved in the medical care of patients with chronic coronary syndromes. The target population includes patients with various clinical presentations of coronary artery disease during stable periods, particularly those preceding or following an acute coronary syndrome. The guidelines address the management of patients with suspected or confirmed chronic coronary syndromes, including those with obstructive and non-obstructive coronary artery disease, microvascular angina, and vasospastic angina.

Key Factors:

Diagnostic Testing: Recommendations for non-invasive and invasive diagnostic tests, including coronary computed tomography angiography (CCTA), stress echocardiography, myocardial perfusion imaging (SPECT/PET), cardiac magnetic resonance imaging (CMR), and invasive coronary angiography with coronary pressure assessment.

Risk Stratification: Assessment of clinical likelihood of obstructive coronary artery disease, estimation of adverse-event risk, and identification of high-risk patients.

Treatment: Guideline-directed medical therapy, lifestyle optimization, antianginal medication, antithrombotic therapy, lipid-lowering drugs, anti-inflammatory agents, and revascularization strategies.

Special Populations: Management of patients with heart failure, angina/ischaemia with non-obstructive coronary arteries, older adults, sex differences, high bleeding-risk patients, and patients with inflammatory rheumatic diseases, hypertension, atrial fibrillation, valvular heart disease, chronic kidney disease, cancer, and human immunodeficiency virus.

ASNC model coverage policy: 2023 cardiac positron emission tomography ⁽⁷⁾

Study Design: The policy document is an update to the 2014 model coverage policy for cardiac PET imaging studies. It describes various clinical situations for which a cardiac PET study is currently indicated, supported by numerous references and cross-referenced with appropriate use criteria (AUC). The document includes new sections on the evaluation of coronary microvascular disease, myocardial viability, cardiac sarcoidosis, and infection.

Target Population: The target population includes patients with known or suspected ischemic heart disease (IHD), coronary artery disease (CAD), myocardial viability, cardiac sarcoidosis, and infection. The policy aims to simplify the process for payers to provide coverage for appropriate cardiac PET procedures and serves as a resource for ASNC members, the cardiology community, referring physicians, and patients.

Key Factors

Clinical Indications: The document details various indications under eight categories, justifying the medical necessity for each indication with evidence provided.

ICD-10 Codes: The policy includes ICD-10 Clinical Modification codes and how they pertain to each appropriate indication.

Evaluation of Coronary Microvascular Disease: The document highlights the importance of PET in evaluating coronary microvascular disease, myocardial viability, cardiac sarcoidosis, and infection.

Radiation Exposure: The policy discusses the radiation exposure associated with cardiovascular PET imaging and emphasizes the goal of reducing radiation exposure without affecting image quality or accuracy.

Coding Guidelines: The document provides detailed coding guidelines for ICD-10 codes, Bill Type codes, Revenue Codes, and CPT/HCPCS codes.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(7–9)

All three articles emphasize the importance of comprehensive management strategies for chronic coronary disease (CCD) and chronic coronary syndromes (CCS). They highlight the need for a multidisciplinary approach, including lifestyle modifications, pharmacological treatments, and revascularization when necessary.

Diagnostic Approaches

- **Horgan et al 2023 JNuclCardiol:** This article focuses on the use of positron emission tomography (PET) for myocardial perfusion imaging (MPI) and metabolic imaging. It discusses the clinical indications for cardiac PET, including its diagnostic accuracy and prognostic value. ⁽⁷⁾
- **Virani et al 2023 JACC:** This guideline provides a detailed approach to the evaluation, diagnosis, and risk stratification of patients with chronic coronary disease. It emphasizes the use of non-invasive imaging techniques such as coronary computed tomography angiography (CCTA) and stress echocardiography. ⁽⁸⁾
- **Vrints et al 2024 EurHeartJ:** This guideline outlines a stepwise approach to the initial management of individuals with suspected chronic coronary syndrome. It includes recommendations for history taking, risk factor assessment, and the use of various diagnostic tests, including CCTA and stress echocardiography. ⁽⁹⁾

Treatment Strategies

- **Horgan et al 2023 JNuclCardiol:** The article discusses the role of PET MPI in guiding therapeutic decision-making, including the assessment of myocardial blood flow and the evaluation of myocardial viability. ⁽⁷⁾
- **Virani et al 2023 JACC:** This guideline provides recommendations for the management of patients with chronic coronary disease, including the use of guideline-directed management and therapy (GDMT), revascularization, and the management of special populations. ⁽⁸⁾

- **Vrints et al 2024 EurHeartJ:** The guideline emphasizes the importance of patient education, lifestyle optimization, and exercise therapy. It also discusses the use of antianginal and anti-ischemic medications, antithrombotic therapy, and lipid-lowering drugs. ⁽⁹⁾

POLICY HISTORY

Date	Summary
July 2025	● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7312-01 for Myocardial Perfusion Imaging and ECG 024 for Myocardial Perfusion Imaging into Evolent Clinical Guideline 7312 for Myocardial Perfusion Imaging (MPI) ○ This guideline also merges Procedure Codes from these two Evolent guidelines ● Added new bullet-point to the General Statement section ● Added a Summary of Evidence and Analysis of Evidence ● Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 7294 for Heart Positron Emission Tomography (PET) Scan

Guideline Number: Evolent_CG_7294	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Indications for determining medical necessity for myocardial perfusion imaging (MPI) with appropriate preference for suitable alternatives, such as stress echocardiography (SE), when more suitable, unless otherwise stated (see **Definitions** section).

Indicated when all the criteria for MPI are met **AND** there is likely to be equivocal imaging results because of body mass index (BMI), large breasts or implants, mastectomy, chest wall deformity, pleural or pericardial effusion, or prior thoracic surgery or results of a prior MPI. ^(1,2) **(AUC Score 7)** ⁽³⁾

See Legislative Language for specific mandates in **Washington**.

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ^(4–8)

INDICATIONS FOR HEART PET ⁽⁹⁾

Suspected Coronary Artery Disease (CAD) ^(10–12)

When neither SE nor MPI have provided or are expected to provide optimal imaging

- **Symptomatic patients without known CAD** (use Diamond Forrester Table ^(13,14)) (**AUC Score 9**) ⁽³⁾
 - Intermediate pretest probability and unable to exercise
 - High pretest probability
 - Repeat testing in a patient with new or worsening symptoms and negative result at least one year ago **AND** meets one of the criteria above
- **Asymptomatic patients without known CAD**
 - Previously unevaluated ECG evidence of possible myocardial ischemia including substantial ischemic ST segment or T wave abnormalities (see Background section) ⁽¹²⁾
 - Previously unevaluated pathologic Q waves (**AUC Score 6**) ⁽³⁾ (see Background section)
 - Unevaluated complete left bundle branch block (**AUC Score 8**) ⁽³⁾

Abnormal Calcium Scores (CAC) ^(3,10)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- STABLE SYMPTOMS with a prior Coronary Calcium Agatston Score of >100. No prior MPI done within the last 12 months (**AUC Score 7**) ⁽¹⁰⁾
- ASYMPTOMATIC high global CAD risk patient with a prior Coronary Calcium Agatston Score of >100. No prior MPI done within the last 12 months ⁽¹⁵⁾
- ASYMPTOMATIC patient with Coronary Calcium Agatston Score > 400 (or a qualitative assessment where 'severe' coronary artery calcification is stated in a report incidentally detected on CT imaging performed for other clinical indications) No prior stress imaging done within the last 12 months) ⁽¹⁶⁾

Inconclusive CAD Evaluation and Obstructive CAD remain a Concern

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- Exercise stress ECG with low-risk Duke treadmill score (≥ 5) (see Background section) but patient's current symptoms indicate an intermediate or high pretest probability
- Exercise stress ECG with an intermediate Duke treadmill score (**AUC Score 8**) ⁽³⁾
- Inconclusive/borderline coronary computed tomography angiography (CCTA) or Single Positron Emission Tomography (SPECT) nuclear stress testing (e.g., 40 - 70% lesions) (**AUC Score 8**) ^(3,10)

- Cardiac PET stress-rest perfusion and metabolic activity study (with ^{18}F -FDG PET) is appropriate in patients with ischemic cardiomyopathy to determine myocardial viability prior to revascularization following an inconclusive SPECT ⁽¹⁰⁾ (**AUC Score 9**) ⁽³⁾
- Non-diagnostic exercise stress test with physical inability to achieve target heart rate (THR)
- An intermediate evaluation by prior stress imaging
- Coronary stenosis of unclear significance on previous coronary angiography ⁽¹⁰⁾ (**AUC Score 8**) ⁽³⁾

Follow-Up Of Patient's Post Coronary Revascularization Percutaneous Coronary Intervention (PCI) or Coronary Artery Bypass Graft (CABG)

When neither SE nor MPI have provided, or are expected to provide, optimal imaging and any of the following ⁽¹⁰⁾:

- **Asymptomatic, follow-up stress imaging** at a minimum of 2 years post coronary artery bypass grafting (CABG), or percutaneous coronary intervention (PCI), (whichever is later), is appropriate only for patients with:
 - High risk: diabetes with accelerated progression of CAD, Chronic Kidney Disease (CKD), peripheral artery disease (PAD), prior brachytherapy, in-stent restenosis (ISR), or saphenous venous graft (SVG) intervention.
 - A history of silent ischemia or
 - A history of a prior left main stent
- For patients with high occupational risk (e.g., associated with public safety, airline and boat pilots, bus and train drivers, bridge and tunnel workers/toll collectors, police officers, and firefighters)

New, recurrent, or worsening symptoms post coronary revascularization are an indication for stress imaging, if it will alter management

Follow-Up Of Known CAD ⁽¹⁰⁾

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Follow-up of asymptomatic or stable symptoms** when last invasive or non-invasive assessment of coronary disease showed hemodynamically significant CAD (ischemia on stress test or $\text{FFR} \leq 0.80$ or significant stenosis in a major vessel ($\geq 50\%$ left main coronary artery or $\geq 70\%$ left anterior descending (LAD), left circumflex (LCX) or right coronary artery (RCA))), over two years ago, without intervening coronary revascularization is an appropriate indication for stress imaging in patients if it will alter management
- When there is a change in symptoms or functional capacity that persists despite guideline directed medical therapy ⁽¹¹⁾

Special Diagnostic Conditions Requiring Coronary Evaluation

When neither SE nor MPI have provided, or are expected to provide, optimal imaging

- **Unevaluated Acute Coronary Syndrome**
 - Prior acute coronary syndrome (as documented in MD notes), without subsequent invasive or non-invasive coronary evaluation within the last 12 months
 - Has ventricular wall motion abnormality demonstrated by another imaging modality and myocardial perfusion imaging is being performed to determine if the patient has myocardial ischemia. No imaging stress test within the last 12 months
- **Heart Failure**
 - Newly diagnosed systolic heart failure or diastolic heart failure, with *reasonable suspicion of cardiac ischemia (prior events, risk factors)*, unless invasive coronary angiography is immediately planned or adequate stress imaging has been done within the last 12 months ⁽¹⁰⁾ **(AUC Score 9)** ⁽³⁾
- **Viability**
 - Reduced left ventricular ejection fraction (LVEF) $\leq 50\%$ requiring myocardial viability assessment to assist with decisions regarding coronary revascularization. (Diversion from PET not required when LVEF less than or equal to 40%) **(AUC Score 9)** ⁽³⁾
- **Ischemia and Nonobstructive Coronary Artery Disease (INOCA)**
 - To diagnose microvascular dysfunction in patients with persistent stable anginal chest pain with suspected ischemia and nonobstructive coronary artery disease (INOCA), as documented in provider notes (*no MPI diversion required*).
- **Arrhythmias**
 - Ventricular arrhythmias
 - Sustained ventricular tachycardia (VT) > 100 bpm, ventricular fibrillation (VF), or exercise-induced VT, when invasive coronary arteriography is not the immediately planned test **(AUC Score 7)** ⁽¹⁰⁾
 - Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, frequent premature ventricular contractions (PVC) (defined as greater than or equal to 30/hour on remote monitoring) without known cause or associated cardiac pathology, when an exercise ECG cannot be performed ^(3,10)
- **Anti-arrhythmic Drug Therapy**
 - Class IC antiarrhythmic drug
 - In the intermediate **(AUC Score 6)** ⁽³⁾ and high **(AUC Score 7)** ⁽³⁾ global risk patient prior to initiation of Class IC antiarrhythmic drug initiation (Propafenone or Flecainide) **(AUC Score 7)** ⁽¹⁰⁾
 - Annually for intermediate and high global risk patients taking Class IC antiarrhythmic drug (Propafenone or Flecainide) **(AUC Score 7)** ⁽³⁾

- **Coronary Anomaly and Aneurism**

- Assessment of hemodynamic significance of one of the following documented conditions:
 - Anomalous coronary arteries ⁽¹⁷⁾ (**AUC Score 7**) ⁽³⁾
 - Muscle bridging of coronary artery ⁽¹⁸⁾
- Coronary aneurysms in Kawasaki's disease ⁽¹⁹⁾ (**AUC Score 8**) ⁽³⁾ or due to atherosclerosis

- **Radiation**

- Following radiation therapy to the anterior or left chest, at 5 years post initiation and every 5 years thereafter ⁽²⁰⁾

- **Cardiac Sarcoidosis**

- May be approved as a combination study with MPI for the evaluation and treatment of sarcoidosis ^(3,21)
 - Evaluation and therapy monitoring in patients with sarcoidosis, after documentation of suspected cardiac involvement by echo or ECG, when cardiac magnetic resonance imaging (CMR) has not been performed
 - Evaluation of suspected cardiac sarcoid, after CMR has shown equivocal or negative findings in the setting of a high clinical suspicion
 - Evaluation of CMR findings showing highly probable cardiac sarcoidosis, when PET could serve to identify inflammation and the consequent potential role for immunosuppressive therapy ⁽²²⁾ (**AUC Score 9**) ⁽³⁾
 - Initial and follow-up PET in monitoring therapy for cardiac sarcoid with immunosuppressive therapy, typically about 4 times over 2 years

- **Infective Endocarditis**

- In suspected infective endocarditis with moderate to high probability (i.e., staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device), when transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) have been inconclusive with respect to diagnosis of infective endocarditis or characterization of paravalvular invasive complications ⁽²³⁾

- **Aortitis**

- For diagnosis and surveillance of Aortitis, PET/CT or PET/MRI hybrid imaging ⁽²⁴⁾
- **NOTE:** If PET/MRI study is requested, there is no specific CPT Code for this imaging study and a Health Plan review will be required. study is requested, there is no specific CPT Code for this imaging study and a Health Plan review will be required.

Prior To Elective Non-Cardiac Surgery

When neither SE nor MPI have provided or are expected to provide optimal imaging

- An intermediate or high-risk surgery with of one or more risk factors (see below), **AND** documentation of an inability to walk (or < 4 METs) **AND** there has not been an imaging

stress test within 1 year ^(25–28)

- **Risk factors:** history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine > 2.0 mg/dL.
- **Surgical Risk:**
 - **High risk surgery:** Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - **Intermediate risk surgery:** Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery
 - **Low risk surgery:** Endoscopic procedures, superficial procedure, cataract surgery, breast surgery
- Planning for any organ or stem cell transplantation is an indication for preoperative stress imaging, if there has not been a conclusive stress evaluation, computed tomography angiography (CTA), or heart catheterization within the past year, at the discretion of the transplant service ⁽²⁹⁾

Post Cardiac Transplant

- Annually, for the first five years post cardiac transplantation, in a patient not undergoing invasive coronary arteriography ⁽³⁰⁾

LEGISLATIVE LANGUAGE

Washington

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease ⁽³¹⁾

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
 - Adult patients with known CAD who have new or worsening symptoms.

- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

CODING AND STANDARDS

Codes

+78434, 78459, 78472, 78491, 78492, 93015, 93016, 93017, 93018, A9555

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

General Overview ^(1,2)

A PET study is a diagnostic test used to evaluate blood flow to the heart. During the test, a small amount of radioactive tracer is injected into a vein. A special camera, called a gamma camera, detects the radiation released by the tracer to produce computer images of the heart. Combined with a medication, the test can help determine if there is adequate blood flow to the heart during activity versus at rest. The medication simulates exercise for patients unable to exercise on a treadmill or stationary cycle.

PET perfusion studies illustrate myocardial blood flow by demonstrating tracer uptake. PET metabolic evaluation studies are used to demonstrate inflammation produced by infiltrative disease such as sarcoidosis, but also enhance the detection of viable (hibernating) myocardium. Hybrid PET-CT scanning combines anatomical information with blood flow assessment and is useful for assessing viable myocardium, especially in chronic heart failure patients with global ischemia, or in patients with multivessel diffuse coronary artery disease as opposed to focal stenotic lesions.

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁵⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Definitions

- Stable patients without known CAD fall into 2 categories ^(3,10,11):
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section).
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant CAD (below):
- The THREE Types of Chest Pain or Discomfort
 - **Typical Angina (Definite)** is defined as including all **3** characteristics:
 - Substernal chest pain or discomfort with characteristic quality and duration
 - Provoked by exertion or emotional stress
 - Relieved by rest and/or nitroglycerine
 - **Atypical Angina (Probable)** has only **2** of the above characteristics
 - **Nonanginal Chest Pain/Discomfort** has only **0 - 1** of the above characteristics

- The medical record should provide enough detail to establish the type of chest pain. From those details, the pretest probability of obstructive CAD is estimated from the Diamond Forrester Table below, recognizing that in some cases multiple additional coronary risk factors could increase pretest probability ^(3,10,11):

Diamond Forrester Table ^(13,14)

Age (Years)	Gender	Typical/ Definite Angina Pectoris	Atypical/ Probable Angina Pectoris	Nonanginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40-49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50-59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very low: < 5% pretest probability of CAD, usually not requiring stress evaluation

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- An uninterpretable baseline ECG includes ⁽¹¹⁾:
 - ST segment depression 1 mm or more; (not for non-specific ST- T wave changes)
 - Ischemic looking T waves; at least 2.5 mm inversions (excluding V1 and V2)
 - Bundle Branch Blocks (BBB)
 - Left BBB
 - Right BBB or intraventricular conduction delay (IVCD), either containing ST or T wave abnormalities (see above)
 - Left ventricular hypertrophy (LVH) with repolarization abnormalities
 - Ventricular paced rhythm
 - Digitalis use with associated ST segment abnormalities
 - Resting HR under 50 bpm on a medication, such as beta-blockers or calcium channel blockers, that is required for patient's treatment and cannot be stopped, with

an anticipated suboptimal workload

- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - 40 ms (1 mm) wide
 - 2 mm deep
 - 25% of depth of QRS complex
- ECG Stress Test Alone versus Stress Testing with Imaging
 - Prominent scenarios suitable for an ECG stress test **WITHOUT** imaging (i.e., exercise treadmill ECG test) require that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise ⁽¹⁰⁾:
 - The (symptomatic) low or intermediate pretest probability patient who can exercise and has an interpretable ECG ⁽¹⁰⁾
 - The patient who is under evaluation for exercise-induced arrhythmia
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - For the evaluation of syncope or presyncope during exertion ⁽³²⁾
- Duke Exercise ECG Treadmill Score ⁽³³⁾
 - Calculates risk from ECG treadmill alone:
 - The equation for calculating the Duke treadmill score (DTS) is: $DTS = \text{exercise time in minutes} - (5 \times \text{ST deviation in mm or } 0.1 \text{ mV increments}) - (4 \times \text{exercise angina score})$, with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting
 - The score typically ranges from - 25 to + 15. These values correspond to low-risk (with a score of $\geq + 5$), intermediate risk (with scores ranging from - 10 to + 4), and high-risk (with a score of $\leq - 11$) categories
- Coronary application of PET includes evaluation of stable patients without known CAD, who fall into two categories ^(3,10,11)
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Websites for Global Cardiovascular Risk Calculators section).
 - **Symptomatic**, for whom we estimate the pretest probability that their chest-related symptoms are due to clinically significant ($\geq 50\%$) CAD (below)
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years. **High global risk by itself generally lacks scientific**

support as an indication for stress imaging. There are rare exceptions, such as patients requiring IC antiarrhythmic drugs who might require coronary risk stratification prior to initiation of the drug.

■ **CAD Risk—Low**

- 10-year absolute coronary or cardiovascular risk less than 10%

■ **CAD Risk—Moderate**

- 10-year absolute coronary or cardiovascular risk between 10% and 20%

■ **CAD Risk—High**

- 10-year absolute coronary or cardiovascular risk of greater than 20%

Websites for Global Cardiovascular Risk Calculators* (34–38)

Risk Calculator	Websites for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

- Definitions of Coronary Artery Disease ⁽¹¹⁾
 - Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more

accurately measured with intravascular ultrasound (IVUS).

- Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. Its incorporation into global risk can be achieved by using the Multi-Ethnic Study of Atherosclerosis (MESA) risk calculator.
- Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate) generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69%
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum lumen cross-sectional area on IVUS ≤ 6 square mm ^(11,39)
 - FFR (fractional flow reserve) ≤ 0.80 for a major vessel ⁽³⁹⁾
 - Demonstrable ischemic findings on stress testing (ECG or stress imaging), that are at least mild in degree
- A major vessel would be a coronary vessel that would be amenable to revascularization if indicated. This assessment is made based on the diameter of the vessel and/or the extent of myocardial territory served by the vessel.
- FFR (fractional flow reserve) is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow.
- Newer technology that estimates FFR from CCTA image is covered under the Evolent Clinical Guideline 7293 for Fractional Flow Reserve CT.
- Anginal Equivalent ^(11,32)
 - Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons to suspect that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia), by presentation of clinical data, such as respiratory rate, oximetry, lung exam, etc. (as well as d-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Most syncope per se is not an anginal equivalent.

Acronyms/Abbreviations

ADLs: Activities of daily living

BMI: Body mass index

CABG: Coronary artery bypass grafting

CAC: Coronary artery calcium

CAD: Coronary artery disease

CCTA: Coronary computed tomography angiography

CMR: Cardiac magnetic resonance imaging

CT(A): Computed tomography (angiography)

DTS: Duke Treadmill Score

ECG: Electrocardiogram

FFR: Fractional flow reserve

IVUS: Intravascular ultrasound

LBBB: Left bundle-branch block

LVEF: Left ventricular ejection fraction

LVH: Left ventricular hypertrophy

MESA: Multi-Ethnic Study of Atherosclerosis

MET: Estimated metabolic equivalent of exercise

MI: Myocardial infarction

MPI: Myocardial perfusion imaging

MR(I): Magnetic resonance (imaging)

PCI: Percutaneous coronary intervention

PET: Positron emission tomography

PFT: Pulmonary function test

PVCs: Premature ventricular contractions

SE: Stress echocardiography

TEE: Transesophageal echocardiography

THR: Target heart rate

TTE: Transthoracic echocardiography

VF: Ventricular fibrillation

VT: Ventricular tachycardia

WPW: Wolff-Parkinson-White

SUMMARY OF EVIDENCE

American Society of Nuclear Cardiology and Society of Nuclear Medicine and Molecular Imaging Joint Position Statement on the Clinical Indications for Myocardial Perfusion PET⁽¹⁾

Study Design: The document is a joint position statement that summarizes the properties and clinical indications of myocardial perfusion PET. It is based on extensive clinical investigations

and meta-analyses that demonstrate the advantages of PET over other noninvasive cardiac imaging modalities.

Target Population: The target population includes patients with known or suspected coronary artery disease (CAD) who meet appropriate criteria for a stress imaging test. This includes:

- Patients unable to complete a diagnostic-level exercise stress imaging study.
- Patients with prior stress imaging studies of poor quality or inconclusive results.
- High-risk patients, such as those with chronic kidney disease, diabetes mellitus, or suspected high-risk CAD.
- Young patients with established CAD who require repeated radiation-associated cardiac imaging procedures.

Key Factors:

1. **High Diagnostic Accuracy:** Myocardial perfusion PET has high sensitivity and specificity for detecting obstructive CAD, outperforming other noninvasive approaches.
2. **Consistent High-Quality Images:** PET images have high myocardial counts, spatial and contrast resolution, and accurate correction for tissue attenuation and scatter.
3. **Low Radiation Exposure:** PET scans expose patients to less than 5 mSv, significantly lower than other radiation-based cardiac assessments.
4. **Short Acquisition Protocols:** Complete rest-stress studies can be acquired in less than one hour, making it convenient for acutely ill or high-risk patients.
5. **Quantification of Myocardial Blood Flow:** PET allows for the measurement of myocardial flow reserve, improving interpretation confidence and patient selection for interventions.
6. **Strong Prognostic Power:** PET provides high discrimination between different levels of risk in all patient populations, including obese and non-obese individuals, men and women, diabetics, and patients with renal dysfunction.

Appropriate Use Criteria for PET Myocardial Perfusion Imaging ⁽³⁾

Study Design: The document is a consensus guideline developed by a multidisciplinary workgroup representing several medical specialty societies. It is based on a systematic review of the literature, expert opinion, and clinical practice guidelines. The study design includes the development of clinical scenarios, systematic synthesis of available evidence, individual and group ratings of clinical indications, and recommendations based on final group ratings and discussions.

Target Population: The target population includes patients with suspected or known coronary artery disease (CAD), asymptomatic patients, patients with diagnosed heart failure, patients with known or suspected cardiac sarcoidosis, patients with arrhythmias, patients with syncope, patients with coronary microvascular disease (CMD), specific populations such as those with advanced obesity or familial hypercholesterolemia, patients undergoing prior testing or procedures, patients undergoing preoperative evaluation for noncardiac surgery, and patients requiring determination of exercise level before initiation of exercise prescription or cardiac rehabilitation.

Key Factors

1. **Appropriate Use Criteria (AUC):** The document outlines AUC for PET MPI in 11 sections, covering various clinical scenarios and patient populations.
2. **Diagnostic and Prognostic Value:** PET MPI is highlighted for its high diagnostic accuracy, sensitivity, and specificity in detecting CAD and CMD. It provides incremental prognostic information that affects clinical decision-making and treatment options.
3. **Clinical Scenarios:** The document includes detailed clinical scenarios with appropriateness scores, ranging from rarely appropriate to appropriate, based on the likelihood of PET MPI affecting clinical management and outcomes.
4. **Methodology:** The AUC development process follows the RAND/UCLA Appropriateness Method, including systematic review, evidence synthesis, individual and group ratings, and consensus recommendations.
5. **Outcome Data:** The document emphasizes the importance of outcome data in guiding the use of PET MPI, particularly in high-risk populations and specific clinical contexts.

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease ⁽¹⁰⁾

Study Design: The study is a report by the American College of Cardiology (ACC) Solution Set Oversight Committee, in collaboration with several other cardiovascular societies. It updates the prior AUC for various cardiovascular imaging modalities, including radionuclide imaging, stress echocardiography, calcium scoring, coronary computed tomography angiography (CCTA), stress cardiac magnetic resonance (CMR), and invasive coronary angiography.

Target Population: The target population includes patients with known or suspected CCD, which encompasses stable ischemic heart disease (SIHD). The clinical scenarios cover both symptomatic and asymptomatic patients, with and without prior testing or revascularization.

Key Factors:

Clinical Scenarios: The document outlines 64 clinical scenarios for the detection and risk assessment of CCD, drawn from common applications and current clinical practice guidelines.

Rating Process: The clinical scenarios were rated by an independent panel using a modified Delphi process. Ratings were categorized as Appropriate (7-9), May Be Appropriate (4-6), or Rarely Appropriate (1-3).

Updates and Changes: Key changes include the removal of preoperative testing scenarios, simplification of clinical scenario tables, and incorporation of new evidence and guidelines.

Assumptions: The study assumes that each test is performed and interpreted by trained professionals, and that patients are receiving optimal standard care.

Advantages and Limitations: The document provides a table outlining the advantages and limitations of various imaging modalities, such as echocardiography, SPECT, PET, CMR, CCTA, and invasive angiography.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(1,3,10):

1. **Importance of PET MPI:** All three articles emphasize the significance of PET myocardial perfusion imaging (MPI) in diagnosing and managing coronary artery disease (CAD). They highlight its high diagnostic accuracy, ability to quantify myocardial blood flow, and prognostic value.
2. **Diagnostic Accuracy:** The articles agree on the high sensitivity and specificity of PET MPI for detecting obstructive CAD. They also note its superiority over other noninvasive imaging modalities in certain clinical scenarios.
3. **Prognostic Value:** The prognostic power of PET MPI is a common theme. The ability to predict future cardiovascular events and guide clinical decision-making is emphasized across all three studies.
4. **Clinical Utility:** The articles discuss the clinical utility of PET MPI in various patient populations, including those with suspected or known CAD, heart failure, and other cardiovascular conditions.

POLICY HISTORY

Date	Summary
July 2025	● This guideline merges two Evolent guidelines with identical clinical criteria: ECG 7294-01 for Heart (Cardiac) PET and ECG 072 for Heart (Cardiac) PET into Evolent Clinical Guideline 7294 for Heart Positron Emission Tomography (PET) Scan ○ This guideline also merges Procedure Codes from these two Evolent guidelines ● Added new bullet-point to the General Statement section ● Added a Summary of Evidence and Analysis of Evidence

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolent Clinical Guideline 2013 for Brain Positron Emission Tomography (PET) Scan

Guideline Number: Evolent_CG_2013	<u>Applicable Codes</u>	
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Original Date: July 1999	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

NOTE: When PET is used to image the brain using amyloid or dotatate (SSTR) tracers, it should be reordered as an oncologic PET using CPT codes 78811 and 78814 (see Evolent_CG_2046 for Positron Emission Tomography (PET) Scan).

See Legislative Language section for legislation for the State of Washington.

INDICATIONS FOR BRAIN PET SCAN

Known Brain Tumor or Cancer ^(1,2)

FDG-PET indications for brain tumor imaging **after** brain MRI is indeterminant or insufficient to:

- Differentiate radiation necrosis or post-treatment change from residual/recurrent tumor
- Differentiate low from high grade glioma
- Evaluation of primary brain lymphoma
- To guide intervention/biopsy

Refractory Seizures

- To determine operability of refractory seizures ⁽³⁾

Mild Cognitive Impairment or Dementia ^(4,5)

FDG PET for evaluation of mild cognitive impairment or dementia in the following situations:

- Detection of early Alzheimer's disease

- To differentiate between Alzheimer's, dementia with Lewy body disease (DLB) and frontotemporal lobar degeneration (FTD)

AND ALL the following criteria are met (criteria apply to either of the above indications):

- Brain MRI is insufficient or indeterminate
- Objective measures demonstrate objective impairment (MMSE/MoCA < 26 or mild cognitive impairment on neuropsychological testing)
- Full lab evaluation (thyroid function tests, CBC, CMP including LFTs and B12) has been completed and if abnormal, have been treated and cognitive difficulty persists
- Medication side effect and medical causes, such as vascular or traumatic or inflammatory etiologies have been excluded

NOTE: Brain CT is acceptable if brain MRI is contraindicated

POST-TREATMENT/PROCEDURAL EVALUATION

- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed

FURTHER EVALUATION OF INDETERMINATE FINDINGS

On prior imaging (unless follow-up is otherwise specified within the guideline):

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

LEGISLATIVE LANGUAGE

Washington

20150116A – Functional Neuroimaging for Primary Degenerative Dementia or Mild Cognitive Impairment* ⁽⁶⁾

**Washington State Health Care Authority
Health Technology Clinical Committee**

Final Findings and Decision

HTCC Coverage Determination:

Functional neuroimaging for primary degenerative dementia or mild cognitive impairment is **not covered**.

HTCC Reimbursement Determination:

Limitations of Coverage: N/A

Non-covered Indicators:

Functional imaging technologies including: fludeoxyglucose (FDG) Positron Emission Tomography (PET), (11)C-dihydrotetrabenazine (C-DTBZ) PET, Single Photon Emission Computed Tomography (SPECT), Functional Magnetic Resonance Imaging (fMRI) for the diagnosis of primary degenerative dementia or mild cognitive impairment.

* Beta-amyloid PET imaging is outside the scope of this coverage determination.

CODING AND STANDARDS

Codes

78608, 78609

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Positron Emission Tomography (PET) scanning can be used to assess brain metabolism and perfusion. Uses include identifying epileptic foci prior to surgery, differentiation of residual tumor versus scar, helping differentiate inconclusive findings on Brain MRI and identifying causes of cognitive decline. ^(1,2,4)

Contraindication and Preferred Studies

- Contraindications and reasons why a CT/CTA cannot be performed may include:

impaired renal function, significant allergy to IV contrast, pregnancy (depending on trimester).

- Contraindications and reasons why an MRI/MRA cannot be performed may include: impaired renal function, claustrophobia, non-MRI compatible devices (such as non-compatible defibrillator or pacemaker), metallic fragments in a high-risk location, patient exceeds weight limit/dimensions of MRI machine.

SUMMARY OF EVIDENCE

ACR Appropriateness Criteria® Brain Tumors ⁽²⁾

Study Design: The guidelines are based on a systematic review of the literature and expert consensus. The recommendations are categorized by clinical scenarios, such as primary brain tumor screening, secondary or metastatic brain tumor screening, pretreatment evaluation, posttreatment surveillance, and evaluation of new or enlarging lesions on posttreatment surveillance.

Target Population: The target population includes adults with various clinical scenarios related to brain tumors:

- **Primary brain tumor screening:** Adults with genetic risk factors for primary CNS tumors.
- **Secondary or metastatic brain tumor screening:** Adults with extracranial malignancies at risk for brain metastases.
- **Pretreatment evaluation:** Adults with suspected intraaxial or extraaxial brain tumors based on prior imaging.
- **Posttreatment surveillance:** Adults with a known history of brain tumors undergoing routine surveillance.
- **Evaluation of new or enlarging lesions:** Adults with a known history of brain tumors presenting with new or enlarging lesions on posttreatment surveillance.

Key Factors:

- **Imaging Modalities:** The guidelines emphasize the use of MRI with and without IV contrast as the primary imaging modality for most clinical scenarios. Advanced imaging techniques such as MR spectroscopy, perfusion MRI, and PET imaging (including FDG-PET and amino acid PET) are also discussed for specific scenarios.
- **Genetic Risk Factors:** Specific genetic conditions associated with primary CNS tumors are identified, including Lynch syndrome, neurofibromatosis, Li-Fraumeni syndrome, and others. Screening recommendations vary based on the genetic condition.
- **Clinical Scenarios:** The guidelines provide detailed recommendations for different clinical scenarios, including the appropriateness of various imaging modalities and the relative radiation levels associated with each procedure.
- **Expert Panel:** The guidelines were developed by an expert panel on neurological imaging, including representatives from various medical institutions and organizations.

EANM practice guidelines for an appropriate use of PET and SPECT for patients with epilepsy ⁽³⁾

Study Design: The study design involves guidelines for the appropriate use of Nuclear Medicine (NM) imaging procedures for patients with epilepsy. The guidelines are written and authorized by the European Association of Nuclear Medicine (EANM) to promote optimal epilepsy imaging, especially in the presurgical setting for children, adolescents, and adults with focal epilepsy.

Target Population: The target population includes patients with epilepsy, specifically those with drug-resistant focal epilepsy. The guidelines aim to assist NM healthcare professionals and specialists such as neurologists, neurophysiologists, neurosurgeons, psychiatrists, psychologists, and others involved in epilepsy management.

Key Factors:

- The prevalence of epilepsy, with an estimated prevalence of more than 50 million people worldwide and an annual incidence of two million.
- The challenges of drug-resistant epilepsy, where approximately 30% of patients do not respond to anti-seizure medication (ASM) and become drug-resistant.
- The role of epilepsy surgery as a treatment option for patients with drug-resistant focal epilepsy, depending on the localization of the seizure focus.
- The use of various imaging modalities such as scalp video/electroencephalography (EEG) telemetry, structural and functional magnetic resonance imaging (MRI), single-photon emission computed tomography (SPECT), and positron emission tomography (PET) to influence and impact therapy decisions.
- The lack of literature-based recommendations for the use of NM imaging procedures in epilepsy, which these guidelines aim to address.

ACR Appropriateness Criteria® Dementia ⁽⁴⁾

Study Design: The document outlines the ACR Appropriateness Criteria for various dementia-related conditions, including mild cognitive impairment (MCI), Alzheimer's disease (AD), frontotemporal dementia (FTD), dementia with Lewy bodies (DLB), vascular dementia (VaD), normal pressure hydrocephalus (NPH), and rapidly progressive dementia (RPD). The criteria are based on a thorough review of the literature and expert panel recommendations.

Target Population: The target population includes adults with cognitive impairments and suspected dementia. Specific variants address different clinical presentations, such as:

- Adults with mild cognitive impairment not meeting criteria for dementia.
- Adults with cognitive impairment and memory deficits, suspecting Alzheimer's disease.
- Adults with cognitive impairment and behavioral abnormalities or progressive aphasia, suspecting frontotemporal dementia.
- Adults with cognitive impairment and visual hallucinations or Parkinsonian symptoms, suspecting dementia with Lewy bodies.

- Adults with cognitive impairment and recent stroke or stepwise decline, suspecting vascular dementia.
- Adults with cognitive impairment and gait disturbance or urinary incontinence, suspecting normal pressure hydrocephalus.
- Adults with rapidly progressive dementia.

Key Factors:

- **Imaging Procedures:** The document discusses various imaging procedures, including MRI, CT, PET/CT, and SPECT/CT, and their appropriateness for different dementia variants.
- **Radiation Levels:** The relative radiation levels associated with each imaging procedure are provided to help assess the risk-benefit ratio.
- **Clinical Presentation:** The criteria consider typical and atypical clinical presentations of dementia and the role of imaging in diagnosis and management.
- **Biomarkers:** The use of biomarkers, such as amyloid and tau PET/CT, is discussed for their role in diagnosing and monitoring dementia.
- **Treatment Considerations:** The document includes recommendations for imaging in the context of treatment with anti-amyloid monoclonal antibodies for Alzheimer's disease.

ANALYSIS OF EVIDENCE

Shared Conclusions ^(2–4):

Imaging Techniques: All three articles emphasize the importance of advanced imaging techniques in diagnosing and managing neurological conditions. They discuss the use of MRI, PET, and SPECT imaging to provide detailed insights into brain structure and function.

Role of PET Imaging: PET imaging is highlighted across all articles as a crucial tool for identifying metabolic abnormalities in the brain. The articles discuss the use of various PET tracers, such as FDG, amyloid, and tau, to detect changes associated with different neurological conditions.

Clinical Utility: The articles agree on the clinical utility of imaging in guiding treatment decisions. They emphasize how imaging can help in the localization of lesions, assessment of disease progression, and evaluation of treatment efficacy.

POLICY HISTORY

Date	Summary
June 2025	• Guideline name changed from Brain PET to Brain Positron Emission Tomography (PET)

	● Guideline number changed from 071 to 2013 ● Added new bullet-point to the General Statement section ● Checked the Medicare Advantage box in the Applicable Lines of Business table ● Added a Summary of Evidence and Analysis of Evidence ● Updated references
August 2024	● All Amyloid PET indications were removed from Brain PET and moved to oncologic PET guideline for CPT coding reasons ● Updated indications for Known Brain Tumor or Cancer ● Added a Special Note about using oncologic PET for brain PET tracer requests
July 2024	● Added special Trace PET and moved Meningioma there ● Mild Cognitive Impairment PET section: expanded the indications to include if Brain MRI is insufficient, objective measures, labs, and medication side effects or medical causes ● Treatment Planning section ○ Expanded indications to include Beta-amyloid treatment, Brain MRI is insufficient, objective measures, Neuropsychological testing, labs, and medical causes ○ Removed Aduhelm (as it is off market) ● Added Contraindications and Preferred Studies section to Background ● Updated References ● Added Legislative Language for Washington

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of



their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

REFERENCES

1. Referenced with permission from the National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Central Nervous System Cancers Version 5.2024. © National Comprehensive Cancer Network, Inc. 2025. All rights reserved. To view the most recent and complete version of the guideline, go online to NCCN.org.
2. American College of Radiology. *ACR Appropriateness Criteria® Brain Tumors*; 2024.
3. Traub-Weidinger T, Arbizu J, Barthel H, et al. EANM practice guidelines for an appropriate use of PET and SPECT for patients with epilepsy. *Eur J Nucl Med Mol Imaging*. 2024;51(7):1891-1908. doi:10.1007/s00259-024-06656-3
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6. Washington State Health Care Authority. *Functional Neuroimaging for Primary Degenerative Dementia or Mild Cognitive Impairment*. 20150116A; 2015. <https://www.hca.wa.gov/about-hca/programs-and-initiatives/health-technology-assessment/functional-neuroimaging-primary-degenerative-dementia-or-mild-cognitive-impairment>

Evolent Clinical Guideline 2052 for Radiopharmaceutical Tumor Localization

Single Proton Emission Computed Tomography (SPECT)

Guideline Number: Evolent_CG_2052	<u>Applicable Codes</u>	
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Original Date: July 2008	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

SPECT: Single-Photon Emission Computed Tomography (SPECT) is a nuclear medicine imaging technique used to localize data from gamma ray emitting injected radiopharmaceuticals to specific anatomical locations within the patient. The resulting 3D images can be reconstructed in multiple planes much like a CT scan uses XR, SPECT utilizes nuclear scintigraphy.

SPECT can be used to localize a tumor, inflammatory process, or radioactive tracer distribution. Vascular flow and blood pool imaging are included if performed. The 78803 code represents single-day imaging of a single area, such as the head, neck, chest, or pelvis, or a single acquisition on one day.

SPECT/CT: (Single-photon emission computed tomography combined with Computed Tomography) is now available in many places. The CT portion helps correct the attenuation (decrease) of photons from the target as they get absorbed/reflected by the soft tissues before reaching the detector. CT helps with anatomic localization much like the CT of PET/CT.

When SPECT/CT is requested, additional CT approvals are NOT needed/provided (unless approvable for other separate indications per guidelines for that body part). The CT portion of a SPECT/CT is included in the specific CPT (i.e., 78830 – SPECT/CT, single area, single day and 78832 – SPECT/CT, multiple areas).

This guideline includes both SPECT and SPECT/CT when routine dynamic and planar imaging is, or is projected to be, insufficient for the following indications.

INDICATIONS

NOTE: “Planar imaging” includes techniques such as X-ray, ultrasound, and various nuclear medicine scans that provide 2-dimensional views. This is compared to “cross sectional imaging” techniques such as CT/MRI that provide 3-dimensional views.

Bone/Joint

Malignancy ⁽¹⁾

Note: For known bone metastases, whole body planar bone scan for staging and restaging is typically sufficient. For patients with impaired renal function who cannot receive iodinated or gadolinium-based contrast agents or undergo MRI for other reasons, SPECT imaging can improve the performance of conventional planar nuclear bone imaging.

- Screening evaluation of patients with malignancy for possible bony metastases presenting with elevated alkaline phosphatase, bone pain, or new pathological fracture when CT/MRI are indeterminate/contraindicated/not available.
- Staging or Restaging evaluation of known or suspected bony metastases when recent overlapping whole-body imaging (CT or PET/CT of the neck, chest, abdomen and pelvis) has not been performed, cannot be performed, or is inconclusive in evaluation of bone metastases.
- Staging and restaging for radionuclide bone therapy for known predominant bone metastases

Infection ^(2,3)

- Osteomyelitis: when prior imaging has been completed with both a plain x-ray **AND** an MRI of the affected area
 - if MRI is contraindicated OR cannot be performed, only prior x-ray is necessary.
- Discitis: When MRI is indeterminate, contraindicated, OR cannot be performed

Bone Viability ⁽⁴⁾

- Detection of early avascular necrosis, bone infarct, or bone graft viability: with prior x-ray completed AND MRI is indeterminate, contraindicated, OR cannot be performed.

Trauma

- Extremities: Detection of stress fractures and other occult skeletal trauma when there is persistent pain in the suspected area after negative or inconclusive x-ray AND MRI is indeterminate, contraindicated, OR cannot be performed. ⁽⁵⁾
- Spine:
 - For indications such as spondylolysis or determination of age of fracture after prior CT/MRI is inconclusive ⁽⁶⁾
 - Spondylolysis evaluation in a child: to determine future treatment plan with persistent

pain after prior conservative treatment AND prior negative or indeterminate MRI ⁽⁷⁾

Persistent Symptoms of Joint or Spine Pain ^(6,8–10)

- Persistent clinical symptoms and/or lack of improvement with active conservative therapy AND prior indeterminate MRI/CT
- Identification of a primary etiology of pain when multiple etiologies are identified on prior MRI/CT **AND** intervention planning is needed (Such as localization of primary facet joint target for injection or ablation)

Post-operative ^(6,11,12)

- Evaluation of persistent symptoms in postoperative spine/joints/bones, after prior X-ray and/or CT/MRI are negative or inconclusive.

Extremities ^(13,14)

- For evaluation of unexplained extremity pain (Such as differentiating complex regional pain syndrome from other causes of pain) when prior x-ray **AND** MRI or Ultrasound or CT is indeterminate

Follow-Up

- A follow-up study is indicated to evaluate a progress after treatment, procedure, intervention, or surgery. Documentation of a clear medical reason why additional imaging is needed for the type and area(s) requested is required.

Cardiac

See Evolent Clinical Guideline 7311 for Multiple Gated Acquisition Scan (MUGA) and Evolent Clinical Guideline 7312 for Myocardial Perfusion Imaging (MPI).

Neck

- Evaluation of Parathyroid adenoma is indicated with ALL of the following:
 - Clinical or laboratory proven hyperparathyroidism (Such as elevated PTH)
 - Prior indeterminate or abnormal ultrasound. If CT and/or MRI have been completed, it should also be inconclusive. ⁽¹⁵⁾
- Evaluation of a Thyroid nodule is indicated when prior planar imaging is inconclusive for the location of a focal thyroid lesion.
- Iodine (I-131 or I-123) imaging for subsequent post-thyroidectomy staging of differentiated thyroid cancers with any ONE of the following ⁽¹⁶⁾:
 - Post-thyroidectomy neck CT/MR showing residual unresectable thyroid tissue/ disease in the neck.
 - Distant metastases as seen on CT/MR

- Post-thyroidectomy unstimulated thyroglobulin > 5-10ng/ml
- Radioactive iodine therapy is being considered for high risk or recurrent tumor.
- Post radioiodine treatment (post therapy scan)
- During post-thyroidectomy surveillance, with rising thyroglobulin or stable / rising antithyroglobulin antibodies or abnormal ultrasound neck

Lung ⁽¹⁷⁾

- Quantification of lung function prior to lung resection/radiation
- Evaluation of:
 - congenital cardiac, thoracic, or pulmonary disease
 - lung transplants
 - bronchopleural fistulae
- Assessment of acute or chronic thromboembolic pulmonary disease
- Suspected acute pulmonary embolism with comorbidities (such as COPD, left heart failure, pneumonia, tumor) **AND** chest x-ray has been performed, AND chest CTA cannot be performed or limited.
- Calculation of lung shunt fraction prior to hepatic radioembolization

Brain

- For preoperative localization of epileptic foci after prior EEG, Brain MRI and PET are insufficient ⁽¹⁸⁾
- DAT scan (used to diagnose Parkinsonian syndromes by visualizing the dopamine transporter (DaT) system in the brain) ^(19,20)
 - To differentiate essential tremor and drug-induced parkinsonism from parkinsonian syndromes
 - For early/inconclusive parkinsonian features
 - For dementia: differentiating Dementia with Lewy Bodies (DLB) from other dementia types, if FDG PET was inconclusive. ⁽²¹⁾
- To evaluate cerebrovascular reserve in planning appropriate endovascular/vascular intervention or neurovascular surgical approach for any ONE of the following:
 - Evaluation for vascular diseases such as Moyamoya ⁽²²⁾
 - Carotid balloon occlusion ⁽²³⁾
 - Hyperperfusion syndromes ⁽²⁴⁾
 - Shunting for idiopathic normal pressure hydrocephalus ⁽²⁵⁾
- Brain perfusion study for evaluation of brain death when planar (2 dimensional) imaging AND CT or MRI are inconclusive ⁽²⁶⁾

- Initial evaluation of adults with cognitive impairment with memory deficits for possible Alzheimer disease (AD) (typical or atypical presentation), frontotemporal dementia (FTD), or dementia with Lewy bodies when MRI brain, CT head, FDG PET, and Amyloid PET are contraindicated or not available. ⁽²¹⁾
- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation of a clear medical reason why additional imaging is needed for the type and area(s) requested is required.

Radionuclide Cisternography (CSF)

- CSF imaging for suspicion of normal pressure hydrocephalus ⁽²¹⁾ or head trauma with suspected CSF leak ⁽²⁷⁾ with ALL of the following:
 - Brain/spine or respective site imaging with appropriate CT/ MRI / CT myelography completed and deemed to be insufficient
 - Planar (2 Dimensional) images projected to be insufficient for localization of abnormality.
- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation of a clear medical reason why additional imaging is needed for the type and area(s) requested is required.

Renal (28,29)

Complex clinical scenarios for which cross-sectional imaging (CT/MRI) AND routine dynamic planar imaging has been or is clearly expected to be insufficient:

- Evaluation of the renal collecting system after prior trauma, surgery, or obstruction in ADULTS
 - Evaluation of renal collecting system with suggestive signs, symptoms, and laboratory findings (Such as flank pain, hematuria, elevated creatinine, renal failure) in ADULTS **AND** CT has been performed and is inconclusive, contraindicated, OR not available
- For evaluation of renal collecting system for obstruction or vesicoureteral reflux in children and young females:
 - After ultrasound and VCUG (voiding cystourethrography) / VUS (voiding urosonography) are inconclusive or discordant with clinical impression
- For diagnosis of possible reno-vascular hypertension with suggestive signs, symptoms, laboratory findings (Such as labile and refractory hypertension, abdominal bruit, edema, elevated creatine, elevated plasma Aldosterone/Renin Ratio) with ALL of the following:
 - Duplex ultrasound is inconclusive; **AND**
 - MRA or CTA cannot be performed or is contraindicated; **AND**
 - The patient has adequate renal function ($GFR >30$ mL/min/1.73 m²) to undergo the study.
- Further evaluation of renal perfusion and split function in the setting of surgery, trauma,

infection, congenital and mass abnormalities after prior indeterminate or abnormal ultrasound

- Diagnosis of renal transplant complications after prior ultrasound has been completed and is indeterminate or abnormal.
- Evaluation of renal infections to discriminate pyelonephritis from cortical scarring
- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation of a clear medical reason why additional imaging is needed for the type and area(s) requested is required.

Abdomen/Pelvis

- Hepatic radioembolization ⁽³⁰⁾
 - For evaluation of pulmonary and gastrointestinal shunts or dosimetry calculations prior to procedure (typically utilizing Tc MAA) (78835 – Radiopharmaceutical quantification measurement)
 - Post-procedure imaging in lieu of PET to determine dose effect/dose toxicity (using the Y90 radiation itself) ⁽³¹⁾ (78835 – Radiopharmaceutical quantification measurement)
- For evaluation of the following ^(32–34):
 - Intermittent/occult gastrointestinal bleeding after initial workup is indeterminate/contraindicated/not available (Endoscopy, CTA)
 - Indeterminate or vascular hepatic lesions or bleed when CT/MRI are indeterminate/contraindicated/not available.
 - Indeterminate accessory splenic tissue/asplenia when CT/MRI are indeterminate/contraindicated/not available.
- Liver transplant (and other hepatic surgery/radiation) preoperative and postoperative function and complications when ultrasound/CT/MR are indeterminate/contraindicated/not available ^(32,33)
- Localization of:
 - Suspected ectopic/residual gastric tissue (Such as Meckel's diverticulum)
 - Abnormalities in hepatobiliary scintigraphy (Such as biliary abnormalities/leaks) when ultrasound (in infants) or CT is indeterminate/contraindicated/not available.
- Peritoneal imaging for evaluation of complications of shunts, dialysis, or peritoneal integrity, when CT is indeterminate/contraindicated/not available ⁽³³⁾
- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

Non-Bone Infection/Inflammation (35–37)

When primary standard modality of CT/CTA/MRI/US are indeterminate/contraindicated/not available for evaluation of any ONE of the following:

- Fever of Unknown Origin
- Non-bone infection/inflammation including infections related to:
 - Transplant and vascular grafts
 - Prosthetic valves when echocardiography AND Coronary CTA are inconclusive.
 - Cardiac implantable devices when echocardiography is inconclusive.

Other Neoplasm / Malignancy

- For initial or restaging of Neuroendocrine tumors (typically In111-octreotide and Iodine-123 MIBG), for any part of the body with any ONE of the following ⁽³⁸⁾:
 - When CT/MRI OR PET imaging is indeterminate/contraindicated/not available.
 - I-131 MIBG: when I131 MIBG therapy is being considered.
 - In111- octreotide: Somatostatin analog therapy is being considered and Ga68 Dotatate PET is not available.
 - Patient with neuroblastoma
- Imaging during/post therapy with radiotherapeutic agents when it will potentially change management.
- Lymphoscintigraphy with sentinel node localizations, for preoperative planning in melanoma, breast, head and neck, and gynecological cancers

Further Evaluation of Indeterminate Findings on Prior Imaging

Unless follow up is otherwise specified within the guideline:

- For initial evaluation of an inconclusive finding on a prior imaging report that requires further clarification
- One follow-up exam of a prior indeterminate MR/CT finding to ensure no suspicious interval change has occurred. (No further surveillance unless specified as highly suspicious or change was found on last follow-up exam.)

CODING AND STANDARDS

Codes

78803 – SPECT

78830 – SPECT/CT

78831 – SPECT, multiple areas

78832 – SPECT/CT, multiple areas

78835 – Radiopharmaceutical quantification measurement

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

SUMMARY OF EVIDENCE (13,39)

SPECT is a nuclear medicine imaging technique that uses gamma ray-emitting radiopharmaceuticals to create 3D images of specific anatomical locations within the patient. This technique is particularly useful for localizing tumors, inflammatory processes, or radioactive tracer distribution.

The indications for SPECT are supported by various evidence-based and peer-reviewed resources from medical publications and societal organization guidelines. Here are some key indications and their rationale:

Bone/Joint/Spine: SPECT is indicated for screening and staging of bone metastases, especially when CT/MRI are indeterminate or contraindicated. It is also useful for patients with impaired renal function who cannot receive iodinated or gadolinium-based contrast agents. SPECT is useful for detecting early avascular necrosis, bone infarct, or bone graft viability when MRI is indeterminate or contraindicated. SPECT is indicated for detecting stress fractures and other occult skeletal trauma when x-ray and MRI are inconclusive. SPECT is indicated for osteomyelitis and discitis when MRI is indeterminate or contraindicated. SPECT is used for identifying the primary etiology of pain when multiple etiologies are identified on prior MRI/CT. SPECT is indicated for evaluating persistent symptoms in postoperative spine/joints/bones when x-ray and/or CT/MRI are negative or inconclusive. SPECT is used for staging and restaging of bony metastases when recent overlapping whole-body imaging is inconclusive.

Soft tissue: SPECT is indicated for initial or restaging of neuroendocrine tumors when CT/MRI or PET imaging is indeterminate. SPECT is used for evaluating fever of unknown origin and infections related to transplant and vascular grafts. SPECT is indicated for evaluating parathyroid adenoma and thyroid nodules when prior imaging is inconclusive. SPECT is used for quantifying lung function prior to lung resection/radiation and evaluating congenital cardiac,

thoracic, or pulmonary disease. SPECT is indicated for preoperative localization of epileptic foci, differentiating Parkinsonian syndromes, and evaluating cerebrovascular reserve. SPECT is used for evaluating the renal collecting system after trauma, surgery, or obstruction, and diagnosing renal transplant complications. SPECT is indicated for evaluating hepatic radioembolization, gastrointestinal bleeding, and liver transplant complications.

ANALYSIS OF EVIDENCE (13,39)

When choosing Single Photon Emission Computed Tomography (SPECT), several factors should be considered to ensure its appropriateness and effectiveness for the patient's condition. Here are some key considerations:

Clinical Indications: SPECT is indicated for various conditions such as bone/joint issues, malignancy, infection, bone viability, trauma, persistent symptoms of joint or spine pain, post-operative evaluation, extremities, follow-up studies, cardiac, neck, lung, brain, radionuclide cisternography (CSF), renal, abdomen/pelvis, non-bone infection/inflammation, other neoplasm/malignancy, and further evaluation of indeterminate findings on prior imaging. It is essential to ensure that the patient's condition aligns with these indications.

Prior Imaging: SPECT is often used when prior imaging techniques such as X-ray, MRI, CT, or ultrasound are indeterminate, contraindicated, or not available. It is important to review the patient's previous imaging results and determine if SPECT is necessary for further evaluation.

Medical Necessity: The guidelines emphasize that medical necessity determination should be based on widely accepted standard of care criteria supported by evidence-based or peer-reviewed sources. Clinicians should ensure that the use of SPECT is medically necessary and justified for the patient's condition.

Patient's Health Status: Consider the patient's overall health status, including any contraindications for other imaging modalities. For example, patients with impaired renal function who cannot receive iodinated or gadolinium-based contrast agents may benefit from SPECT.

Follow-Up: SPECT may be indicated for follow-up studies to evaluate progress after treatment, procedure, intervention, or surgery. Clear medical reasons for additional imaging should be documented.

POLICY HISTORY

Date	Summary
July 2025	- Updated names and numbers of referenced cardiac guidelines - Guideline name changed to Radiopharmaceutical Tumor Localization Single Photon Emission Computed Tomography (SPECT)

Date	Summary
June 2025	• Updated citations • Checked Medicare Advantage Line of Business • Added third bullet to General Information • Added Summary of Evidence and Analysis of Evidence • Guideline name changed from Evolent Clinical Guideline 078 for Single Proton Emission Computed Tomography (SPECT) Radiopharmaceutical Tumor Localization to Evolent Clinical Guideline 2052 for Radiopharmaceutical Tumor Localization (SPECT) • Guideline number changed from 078 to 2052 • Clarified SPECT imaging terminology • Clarified indications for various neoplasms and infection
May 2024	• Updated references • Eliminated background sections. • Replaced references to drug names with drug class

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.



Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 2046 for Positron Emission Tomography (PET) Scan, PET Scan with Computed Tomography (CT) for Attenuation

Guideline Number: Evolent_CG_2046	<u>Applicable Codes</u>	
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Original Date: September 1997	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Oncologic PET is generally indicated for biopsy-proven cancer or strongly suspected cancer based on other diagnostic testing. The appropriateness of an ordered PET/CT study is dependent on the type of cancer and which radiopharmaceutical will be used for the PET/CT.

Special Note

See legislative language for specific mandates in the State of Washington

See legislative language for specific mandates in the State of Arkansas

INDICATIONS

Bone Tumors & Sarcomas

Angiosarcoma ⁽¹⁾

Angiosarcoma is a rare and aggressive cancer that originates in the lining of blood vessels and lymph nodes. Most patients undergo both conventional imaging with CT or Magnetic Resonance Imaging (MRI) of the primary site of disease, CT Chest and MRI Brain, in addition to PET/CT to determine the extent of disease and response to treatment.

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - Indicated

Chondrosarcoma ⁽²⁾

Most patients with this disease undergo conventional imaging with a CT or MRI of the primary disease site, with or without CT Chest. PET/CT is not used. Patients with metastatic chondrosarcoma undergo imaging with CT abdomen/pelvis in addition to other imaging. **De-differentiated chondrosarcoma is treated according to the osteosarcoma pathway. Mesenchymal chondrosarcoma is treated according to the Ewing sarcoma pathway.**

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - NOT Indicated

Chordoma ⁽²⁾

Most patients with this disease undergo conventional imaging with a CT or MRI of the primary disease site, CT Chest, and CT Abdomen & Pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below. Poorly differentiated or de-differentiated chordoma is treated according to the soft tissue sarcoma guideline.

- Initial Staging
- Indicated to clarify inconclusive conventional imaging
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When initial staging PET demonstrated disease not seen on conventional imaging
- Pre-Surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When initial staging PET demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When initial staging PET demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Clear Cell Sarcoma, Epithelioid Sarcoma, Rhabdomyosarcoma ⁽¹⁾

Most patients undergo both conventional imaging with CT or MRI of the primary site of disease and CT Chest in addition to PET/CT to determine the extent of disease and response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated

- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Ewing Sarcoma (includes extraosseous Ewing sarcoma, mesenchymal chondrosarcoma, and desmoplastic small round cell tumors)⁽²⁾

Most patients with this disease undergo imaging evaluation with a CT or MRI of the primary disease site, CT Chest, and a PET/CT. Given that treatment for the disease is intensive and multi-modal (chemotherapy, surgery and/or radiation therapy) and requires extensive coordination across medical specialties, multiple imaging studies are appropriate throughout the treatment course to facilitate appropriate and timely care delivery.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - For patients with a history of metastatic disease, indicated every 3 months for 2 years, then every 4 months up to year 3 post completion of treatment

Giant Cell Tumor of Bone⁽²⁾

Most patients with this disease undergo conventional imaging with a CT or MRI of the primary disease site, with or without CT Chest. PET/CT is not used. Malignant transformation is treated according to the Osteosarcoma guideline.

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - **NOT** Indicated

Malignant Peripheral Nerve Sheath Tumor (MPNST) ⁽¹⁾

MPNST is a rare and aggressive tumor that can occur either spontaneously or in individuals with NF1. PET/CT is used in confirmed MPNST in addition to conventional imaging with a CT or MRI of the primary disease site, with or without CT Chest. There are additional indications for PET when transformation of a neurofibroma to MPNST occurs as detailed below.

- Initial Staging - biopsy confirmed diagnosis (regardless of NF1 Status)
 - Indicated if considering neoadjuvant therapy **OR**
 - To clarify inconclusive conventional imaging
- Initial Staging - suspected diagnosis in setting of known Neurofibromatosis Type 1 (NF1)
 - Indicated if there is concern for malignant transformation of neurofibroma to MPNST based on **ANY ONE** of the following:
 - Change in conventional imaging (e.g. growth or change in characteristics of mass)
 - Change in texture on exam
 - Change in symptoms (new or worsening pain)
- Restaging (for confirmed MPNST, regardless of NF1 status)
 - Indicated if being treated with chemotherapy **OR**
 - To clarify inconclusive conventional imaging
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Myxoid/Round Cell Liposarcoma ⁽¹⁾

Myxoid/round cell liposarcoma is a rare subtype of liposarcoma, a cancer that originates in fat cells. Most patients undergo both conventional imaging with CT or MRI of the primary site of disease, MRI Spine, in addition to PET/CT to determine the extent of disease and response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation

- Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Osteosarcoma (including giant cell tumor of bone with malignant transformation) ⁽²⁾

Most patients with this disease undergo imaging evaluation with a CT or MRI of the primary disease site, CT Chest, and a PET/CT. Given that treatment for the disease is intensive and multi-modal (chemotherapy, surgery and/or radiation therapy) and requires extensive coordination across medical specialties, multiple imaging studies are appropriate throughout the treatment course to facilitate most appropriate and timely care delivery.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - Indicated for patients with a history of metastatic disease every 3 months for 2 years, every 6 months for 3 years (total 5 years off treatment)

Soft Tissue Sarcoma - All Other Histologies ⁽¹⁾

Soft tissue sarcomas are a group of rare cancers that develop in the soft tissues of the body (e.g. muscles, fat, blood vessels, nerves, tendons, and linings of joints). There are more than 50 types of soft tissue sarcomas that are treated with a combination of surgery, radiation therapy, and chemotherapy. For all soft tissue sarcoma sub-types not specifically mentioned, most patients undergo conventional imaging with CT or MRI of the primary site of disease, CT Chest, with or without CT Abdomen & Pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated if considering neoadjuvant therapy **OR**
 - To clarify inconclusive conventional imaging
- Restaging

- Indicated if being treated with chemotherapy **OR**
- To clarify inconclusive conventional imaging **OR**
- When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated if being treated with chemotherapy **OR**
 - To clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated if being treated with chemotherapy **OR**
 - To clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Breast Cancer ⁽³⁾

FDG PET

The need for and type of imaging evaluations for this disease vary depending on the stage of the disease. Most patients with stage I and II breast cancer (based on pathologic evaluation of the primary breast mass and axillary lymph nodes) do not undergo advanced imaging evaluations. CT scans of the chest, abdomen and pelvis are indicated for stage I and II breast cancer if there are specific signs or symptoms suggesting disease spread. In stage I and II patients, FDG PET/CT is rarely needed and can be considered on a case-by-case basis to supplement conventional imaging. In stage III and IV patients, conventional imaging with CT scans of the chest, abdomen and pelvis and bone scan to evaluate for metastatic disease are appropriate. FDG PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Stage I, II:
 - If concern distant metastatic disease, indicated to clarify inconclusive findings on conventional imaging (CT chest, abdomen and pelvis and/or bone scan) **OR**
 - If abnormal finding on breast MRI, indicated to clarify inconclusive findings when finding will change stage and/or treatment approach (indeterminate findings in the infraclavicular, internal mammary, or supraclavicular lymph nodes)
 - Stage III, IV:
 - Indicated to clarify inconclusive findings on conventional imaging after full staging is complete (CT scans of the chest, abdomen and pelvis and bone scan)
- Restaging

- Indicated to clarify inconclusive findings on conventional imaging **OR**
- When initial staging PET demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive findings on conventional imaging when results will impact the operative plan
- Recurrence
 - Local recurrence:
 - If abnormal finding on breast MRI, indicated to clarify inconclusive findings when finding will change stage and/or treatment approach (indeterminate findings in the infraclavicular, internal mammary, or supraclavicular lymph nodes)
 - Systemic recurrence:
 - Indicated to clarify inconclusive findings on conventional imaging after full staging is complete (CT scans of the chest, abdomen and pelvis and bone scan)
- Surveillance
 - **NOT** indicated

Special Tracer PET (FES/Cerianna)

FES PET/CT is indicated for use in select patients with a previous diagnosis of estrogen-receptor positive (ER+) breast cancer who experience recurrence or progression. Specific indications are detailed below.

- Initial Staging, Restaging, Pre-surgical evaluation, Surveillance
 - **NOT** Indicated
- Recurrence
 - **FES** (Fluoroestradiol F 18 or Cerianna®) is indicated for recurrent or metastatic breast cancer when **ALL** of the following are present:
 - Biopsy of recurrent or metastatic site is indeterminate for ER status **OR** unable to be performed **AND**
 - ER status is needed to make a treatment decision

CNS Cancers ⁽⁴⁾

All Histologies

When an oncologic PET using FDG (using CPT codes 78811 and 78814) is requested for a primary brain malignancy, it should be reordered as a Brain PET (CPT 78608).

When a tracer other than FDG is used (such as SSTR (dotatate) for meningioma), the CPT codes covered by this guideline (78811 and 78814) apply when medical necessity is met (see indications below) rather than the Brain PET code (CPT code 78608).

NOTE: See non-malignant disease section for amyloid/dementia

Meningioma

Most patients with this disease undergo imaging evaluation with MRI of the brain and possibly the spinal axis. SSTR (Dotatate) PET/CT is used to supplement conventional imaging in the scenarios described below.

- Special Tracer PET: **SSTR** (Dotatate) PET
 - Initial Staging:
 - Indicated if diagnosis in question after Brain MRI (**biopsy not needed**)
 - Restaging
 - Indicated if presence of residual disease in question after Brain MRI (**biopsy not needed**)
 - Pre-surgical evaluation
 - Indicated if extent of disease in question after Brain MRI (**biopsy not needed**)
 - Recurrence
 - Indicated if Brain MRI indeterminate for recurrence (**biopsy not needed**)
 - Surveillance
 - **NOT** indicated

NOTE: See above all histologies section regarding FDG

Primary CNS Lymphoma

This is a rare and aggressive lymphoma that originates in the central nervous system. PET/CT is used to determine the extent of disease and to monitor response to treatment. MRI of the brain and whole spine are appropriate in addition to PET/CT.

- Initial Staging:
 - Indicated
- Restaging:
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Gastrointestinal Tract Cancers

Anal Carcinoma (including perianal carcinoma) ⁽⁵⁾

Most patients with this disease undergo conventional imaging with CT chest, abdomen and pelvis with or without MRI pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - With prior indeterminate imaging **OR**
 - To verify staging before treatment after CT chest, abdomen and pelvis are complete and show localized disease
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Colon Cancer and Appendiceal Adenocarcinoma ⁽⁶⁾

Most patients with this disease undergo conventional imaging with CT Chest and CT Abdomen & Pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below. When there are known or suspected liver metastases at any stage in treatment, Abdomen MRI is indicated in addition to PET/CT.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - In patients considered for image-guided liver-directed therapies
- Restaging
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - In patients considered for image-guided liver-directed therapies **OR**

- With rising CEA and no evidence of disease on conventional imaging **OR**
- When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - With rising CEA and stable findings or no evidence of disease on conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

NOTE: Circulating tumor DNA (ctDNA) is not recommended in the surveillance setting to monitor for disease recurrence. Conventional imaging is appropriate with rising ctDNA testing. PET/CT is not supported to evaluate a patient with a positive ctDNA test who has negative conventional imaging.

Esophageal & EJ Junction Cancers (squamous cell carcinoma and adenocarcinoma) ⁽⁷⁾

Most patients with this disease undergo conventional imaging with CT Chest and CT abdomen with or without CT of the pelvis. CT is superior to PET/CT for evaluation of local and regional disease. For patients who do not have clear distant metastatic disease on initial CT evaluation, PET/CT has shown metastatic disease in a large percentage of cases, changing treatment plans and prognosis.

- Initial Staging
 - Stages I-III (based on initial CT scans)
 - Indicated
 - Stage IV (based on initial CT scans)
 - To clarify inconclusive conventional imaging when result will impact treatment plan
- Restaging

- Stages I-III:
 - Indicated
- Stage IV:
 - Indicated to clarify inconclusive imaging on conventional imaging when result will impact treatment plan **OR**
 - If previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated
 - **NOTE:** Following chemoradiation PET is indicated 5-8 weeks after completion of therapy
- Recurrence
 - Indicated if conventional imaging does not demonstrate distant metastases **OR**
 - To clarify inconclusive conventional imaging **OR**
 - If previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Gastric Cancer ⁽⁸⁾

Most patients with this disease undergo conventional imaging with CT Chest and CT abdomen and pelvis. PET/CT is useful in patients with locally advanced or metastatic disease to further delineate the extent of disease.

- Initial Staging
 - Indicated for patients with locally advanced (T2 or higher, N1 or higher) or metastatic disease on conventional imaging **OR**
 - To clarify inconclusive conventional imaging
- Restaging
 - Indicated if the patient received neoadjuvant/perioperative treatment **OR**
 - To clarify inconclusive conventional imaging **OR**
 - If previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated if the patient received neoadjuvant/perioperative treatment **OR**
 - To clarify inconclusive conventional imaging **OR**
 - If previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence

- Indicated
- Surveillance
 - **NOT** indicated

Gastrointestinal Stromal Tumors ⁽⁹⁾

Gastrointestinal stromal tumors are rare cancers that originate in the digestive system, most often in the stomach and small intestine. Most patients with this disease undergo conventional imaging evaluation with CT scans of the chest, abdomen and pelvis. Surgical resection of the primary tumor is a mainstay of treatment. PET/CT is useful in select circumstances detailed below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - In patients who are not candidates for up front surgical resection
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - Once 2-4 weeks after initiation of TKI (tyrosine kinase inhibitor) therapy **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - If needed to determine surgical resectability **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - In patients who are not candidates for up front surgical resection **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Rectal Cancer ⁽¹⁰⁾

Most patients with this disease undergo conventional imaging with CT Chest, CT Abdomen & Pelvis, with or without MRI Pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below. When there are known or suspected liver metastases, Abdomen MRI is indicated in addition to PET at any phase in treatment.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**

- If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
- In patients considered for image-guided liver-directed therapies
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - In patients considered for image-guided liver-directed therapies **OR**
 - With rising CEA and no evidence of disease on conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - In patients considered for image-guided liver-directed therapies **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - If conventional imaging demonstrates potentially surgically curable metastatic disease **OR**
 - With rising CEA and no evidence of disease on conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

NOTE: Circulating tumor DNA (ctDNA) is not recommended in the surveillance setting to monitor for disease recurrence. Conventional imaging is appropriate with rising ctDNA testing. PET/CT is not supported to evaluate a patient with a positive ctDNA test who has negative conventional imaging.

Small Bowel Adenocarcinoma ⁽¹¹⁾

Most patients with this disease undergo conventional imaging with CT Chest and CT Abdomen & Pelvis. MRCP is sometimes needed for duodenal malignancies. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease)

- Restaging
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging (including evaluation of peritoneal disease) **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Genitourinary Cancers

Bladder Cancer ⁽¹²⁾

Most patients with this disease undergo conventional imaging with CT chest, abdomen and pelvis. PET/CT is used to supplement conventional imaging as PET/CT has demonstrated the ability to identify metastatic disease not seen on CT scans in a significant percentage of patients.

- Initial Staging
 - Non-muscle invasive bladder cancer (NMIBC):
 - **NOT** indicated
 - Muscle-invasive bladder cancer (MIBC):
 - Indicated to verify staging before treatment after CT chest, abdomen and pelvis are complete and show localized disease **OR**
 - To clarify inconclusive conventional imaging outside of the urinary tract
- Restaging
 - Non-muscle invasive bladder cancer (NMIBC):
 - **NOT** indicated
 - Muscle-invasive bladder cancer (MIBC):
 - Indicated to clarify indeterminate findings on conventional imaging outside of the kidney or bladder **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging

- Pre-surgical evaluation
 - Indicated prior to cystectomy to verify staging after pre-surgical restaging CT chest, abdomen and pelvis are complete
- Recurrence
 - Indicated to clarify inconclusive conventional imaging outside of the kidney or bladder **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging

Kidney Cancer ⁽¹³⁾

Most patients with this disease undergo conventional imaging with CT scans of the chest, abdomen and pelvis. PET/CT has several limitations in this disease. The FDG tracer is excreted through the kidneys, decreasing the contrast between renal lesions and kidney tissue potentially obscuring or masking results. Additionally, FDG is inconsistently taken up by renal cell carcinoma making the validity of the study questionable. PET/CT is not routinely used.

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - **NOT** indicated

Prostate Cancer ⁽¹⁴⁾

Prostate cancer is typically diagnosed on biopsy. Localized disease may be treated with radiation, surgery or observed on an active surveillance protocol. Following definitive treatment to the prostate with surgery (radical prostatectomy (RP)), the PSA level should be undetectable after 3 months post-surgery. Following radiation to the prostate, the PSA may fluctuate. Following definitive treatment to the prostate (radiation or surgery), patients are monitored with PSA levels. When the PSA indicates a concern (see recurrence) this may be called a biochemical recurrence. Metastatic disease may be treated with systemic therapy (which may be continuous or intermittent) and is typically followed by monitoring PSA levels and conventional imaging. PSMA PET/CT is used to verify extent of disease at diagnosis for higher risk patients and to evaluate for recurrent disease when PSA is rising. PSMA PET/CT has several additional specific indications described below. Pelvis MRI is indicated in addition to PSMA PET/CT.

Neuroendocrine/small cell variant is typically followed with CT scans of the chest, abdomen and pelvis and bone scan. FDG PET/CT can be used in select circumstances.

- **FDG PET**
 - Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance:
 - Small cell variant:
 - Indicated to clarify inconclusive conventional imaging
 - All other patients:
 - **NOT** indicated
- **Special Tracer (PSMA) PET**

- Initial Staging (PSMA is the ONLY tracer appropriate for initial staging)
 - Indicated for **ANY** of the following:
 - Patients with very high risk, high risk, or unfavorable intermediate risk prostate cancer (see **background**) **OR**
 - With prior imaging that is indeterminate for either lymph node involvement or metastatic disease **AND** clarification of that finding will change treatment

NOTE: Not indicated for initial staging of known distant metastatic disease

NOTE: A biopsy typically confirms the diagnosis of prostate cancer prior to PSMA PET. If the PSA is > 50, there is no clinical concern for infection **AND** there is an intent to treat the patient for prostate cancer without biopsy confirmation, PSMA PET is indicated.

- Restaging (PSMA):
 - Known Metastatic Disease
 - With prior indeterminate imaging **OR**
 - Discordance between imaging and PSA (i.e. rising PSA with stable imaging or stable PSA with progression on imaging) **OR**
 - To verify presence of PSMA-positive lesions prior to administration of Lu-177/Pluvicto)
- Pre-surgical evaluation (radical prostatectomy)
 - Active Surveillance
 - Indicated when disease progresses to very high risk, high risk or unfavorable intermediate risk using the most recent Gleason score/biopsy result, clinical stage and PSA level
 - Post-radiation
 - Prior to salvage prostatectomy when PSMA PET has not been done to confirm localized disease (see **Recurrence section**)
 - Known metastatic disease
 - **NOT** indicated
- Recurrence (PSMA)
 - Post Radical Prostatectomy biochemical recurrence
 - Indicated for **ANY ONE** of the following:
 - ◆ PSA persistence defined as detectable PSA (0.1ng/mL or greater) at 3 months post-operatively (only one level required)
 - ◆ Rising PSA on two or more occasions
 - ◆ PSA rise to > 0.1ng/mL if PSA was previously undetectable
 - ◆ PSA has doubled since last negative PSMA PET (repeat level verifying doubling required if PSA is not progressively rising)

- Post Prostate Whole Gland Radiation biochemical recurrence
 - Indicated for **ANY ONE** of the following:
 - ◆ PSA increase of ≥ 2 ng/mL above the nadir when increase is verified on repeat level
 - ◆ Progressively rising PSA above the nadir (two separate levels above nadir required)
 - ◆ PSA has doubled since last negative PSMA PET (repeat level verifying doubling required if PSA is not progressively rising)
- Imaging Recurrence
 - Indicated with prior imaging that is indeterminate for either lymph node involvement or metastatic disease **AND** clarification of that finding will change treatment
- Surveillance
 - Active surveillance of localized disease
 - Indicated when disease progresses to very high risk, high risk or unfavorable intermediate risk using the most recent Gleason score/biopsy result, clinical stage and PSA level
 - Observation of metastatic disease
 - Indicated when there is discordance between imaging and PSA (i.e. rising PSA with stable imaging or stable PSA with progression on imaging)
 - Post-treatment
 - **NOT** indicated (see Recurrence section if concern for recurrent disease)

Penile Cancer ⁽¹⁵⁾

Most patients with this disease undergo conventional imaging with CT of the chest, abdomen and pelvis, with or without an MRI of the pelvis to evaluate nodal disease. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - With **ANY ONE** of the following
 - T1b or higher primary tumor
 - Palpable lymph nodes (any T stage)
 - Abnormal lymph nodes on imaging
 - Suspected metastatic disease
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**

- To evaluate suspected inguinal lymph node positive disease (based on imaging or exam) **OR**
- When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - To evaluate suspected inguinal lymph node positive disease (based on imaging or exam) **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Testicular Cancer ⁽¹⁶⁾

Testicular germ cell tumors are divided into two groups - seminomas and non-seminomas (embryonal carcinoma, yolk sac tumor, choriocarcinoma, teratoma). Most patients with this disease undergo conventional imaging with CT scans of the chest, abdomen and pelvis. PET/CT is used in rare circumstances to supplement conventional imaging when needed to determine a treatment plan.

- Initial Staging
 - **NOT** indicated
- Restaging
 - Non-seminoma:
 - **NOT** indicated
 - Pure seminoma:
 - With a residual mass > 3cm following chemotherapy **AND** it has been at least 6 weeks since completion of chemotherapy

NOTE: If this PET is equivocal or borderline for residual disease, an additional repeat PET >6 weeks later is appropriate to identify patients that can be safely observed without additional surgery. If a persistently FDG-avid mass is present on the second PET, resection or biopsy is recommended.

- Pre-surgical evaluation
 - **NOT** indicated
- Recurrence
 - **NOT** indicated

- Surveillance
 - **NOT** indicated

Gynecological Cancers

Cervical Cancer (squamous cell carcinoma, adenocarcinoma, and small cell neuroendocrine carcinoma of the cervix (NECC)) and Vaginal Cancer ⁽¹⁷⁾

For most patients, PET/CT is used to determine the extent of disease, monitor response to treatment, and in high-risk patients monitor for recurrence after treatment. Brain MRI is indicated in addition to PET for patients with NECC.

- Initial Staging
 - Indicated
 - Pelvis MRI is indicated in addition to PET
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - Surveillance imaging in the absence of signs or symptoms of recurrent disease in the first two years following treatment is appropriate for some higher stage patients. PET/CT for surveillance is at the discretion of the ordering provider.

Uterine Neoplasms (Endometrial carcinoma and uterine Sarcoma) ⁽¹⁷⁾

Most patients with this disease undergo conventional imaging with CT Chest and CT Abdomen & Pelvis, with or without MRI pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - All histologic subtypes:
 - Indicated to clarify inconclusive conventional imaging
 - High-grade carcinoma (poorly differentiated, serous clear cell, undifferentiated carcinoma, carcinosarcoma)
 - Indicated
- Restaging

- All histologic subtypes:
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
- High-grade carcinoma (poorly differentiated, serous clear cell, undifferentiated carcinoma, carcinosarcoma)
 - Indicated
- Pre-surgical evaluation
 - All histologic subtypes:
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - High-grade carcinoma (poorly differentiated, serous clear cell, undifferentiated carcinoma, carcinosarcoma)
 - Indicated
- Recurrence
 - All histologic subtypes:
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - High-grade carcinoma (poorly differentiated, serous clear cell, undifferentiated carcinoma, carcinosarcoma)
 - Indicated
- Surveillance
 - **NOT** indicated

Gestational Trophoblastic Neoplasia ⁽¹⁸⁾

Gestational trophoblastic neoplasia (invasive moles, choriocarcinomas, placental-site trophoblastic tumors, epithelioid trophoblastic tumors) arise from abnormal growth of trophoblastic cells (cells that normally develop into the placenta during pregnancy). Treatment is often multimodal (chemotherapy, surgery, and/or radiation therapy). Most patients with this disease undergo conventional imaging evaluation with CT chest, abdomen and pelvis with or without MRI Pelvis. PET/CT is useful in select circumstances detailed below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - To evaluate for potentially surgically curable metastatic disease

- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - To evaluate for potentially surgically curable metastatic disease **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - To evaluate for potentially surgically curable metastatic disease **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - Indicated for patients when hCG is an unreliable tumor marker, at the end of treatment then every 6-12 months for up to 3 years

Ovarian, Fallopian Tube, and Primary Peritoneal Cancer ⁽¹⁹⁾

Most patients with this disease undergo conventional imaging with CT chest, abdomen and pelvis, with or without MRI pelvis. PET/CT is also commonly used to determine the extent of disease and monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - Indicated when tumor markers are unreliable, the physical exam is unreliable, and/or there is a high risk of recurrence at the discretion of the ordering provider

Vulvar Cancer (squamous cell carcinoma and adenocarcinoma) ⁽²⁰⁾

Most patients with this disease undergo conventional imaging with MRI Pelvis, and CT scans of the chest, abdomen and pelvis if there is a clinical concern for metastatic disease. PET/CT is used to supplement conventional imaging in the scenarios described below. Vulvar and vulvovaginal melanoma follow the cutaneous melanoma guideline.

- Initial Staging
 - If clinical stage II or higher (extension beyond vulva/perineum) **OR**
 - For patients with positive sentinel lymph node biopsy to evaluate for undissected nodal disease in the groin/pelvis **OR**
 - Indicated to clarify inconclusive conventional imaging
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - Once 3-6 months after completion of primary therapy **OR**
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Head & Neck Cancer (including cancers of the oral cavity, nasopharynx, oropharynx, hypopharynx, larynx (glottic and supraglottic), paranasal sinuses, salivary glands, and mucosal melanoma) ⁽²¹⁾

Most patients with this disease undergo conventional imaging with CT or MRI of the primary site of disease and the neck as well as PET/CT. Most patients receive surgery and/or radiation therapy. PET/CT is useful after completion of treatment in the scenarios detailed below.

- Initial Staging
 - Indicated
 - **NOTE:** For Initial staging requests where there is concern for H&N cancer based on symptoms, exam, or pathology (e.g. positive biopsy of lymph nodes within the neck) without a confirmed primary tumor site - patients should undergo conventional imaging. If conventional imaging does not reveal an obvious primary, PET/CT should be ordered before exam under anesthesia, biopsies and tonsillectomy to help identify potential primary sites before any intervention occurs.

- Restaging
 - Indicated
 - **NOTE:** Given the overlapping time intervals for primary site imaging and end of treatment FDG PET/CT imaging, both primary site and PET/CT imaging can be performed at the same time without being considered overlapping imaging. If the end of therapy PET demonstrates possible residual disease, one additional PET is appropriate ≥ 6 weeks after end-of-therapy PET as it may help identify those patients who can be safely observed without additional cancer-directed treatment
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Leukemias & Lymphomas

Acute Lymphoblastic Leukemia (ALL) (Pediatric and Adult) (22,23)

Most patients with this disease do not require routine imaging evaluations to determine and/or monitor the extent of disease (bone marrow evaluation is used to monitor disease response). For patients with physical exam findings or imaging findings (Xray, ultrasound or CT scan) suggestive of lymphomatous involvement, PET/CT is the preferred imaging modality.

- Initial Staging
 - Indicated with physical exam findings of lymphomatous involvement **OR**
 - If other imaging (x-ray, ultrasound, or CT scan) demonstrates possible lymphomatous involvement
- Restaging
 - If lymphomatous involvement was present at diagnosis **OR**
 - With new signs or symptoms of disease progression during treatment
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated with physical exam findings of lymphomatous involvement **OR**
 - If other imaging (x-ray, ultrasound, or CT scan) demonstrates possible lymphomatous involvement

- Surveillance
 - **NOT** indicated

Acute Myeloid Leukemia (AML) (Pediatric and Adult) ⁽²⁴⁾

Most patients with this disease do not require routine imaging evaluations to determine and/or monitor the extent of disease (bone marrow evaluation is used to monitor disease response). For patients with clinical suspicion for extramedullary disease (e.g. lymph nodes, spleen liver, skin, gingiva, CNS), conventional imaging with CT scans or PET/CT are used.

- Initial Staging
 - Indicated with clinical suspicion for extramedullary disease (myeloid sarcoma) (on exam or prior imaging)
- Restaging
 - Indicated if extramedullary disease was present at diagnosis **OR**
 - If there is clinical suspicion for progression during treatment
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated with clinical suspicion for extramedullary disease (myeloid sarcoma) (on exam or prior imaging)
- Surveillance
 - **NOT** indicated

B-Cell Lymphomas – Adult (Follicular lymphoma, marginal zone lymphoma, primary mediastinal large B-cell lymphoma, mantle cell lymphoma, diffuse large B cell lymphoma, Burkitt lymphoma, B-lymphoblastic lymphoma, all others) ⁽²⁵⁾

B cell lymphomas represent several different specific cancer types. PET/CT is commonly used to determine the extent of disease and monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence

- Indicated
- Surveillance
 - Follicular lymphoma, primary mediastinal large B-cell lymphoma, diffuse large B cell lymphoma:
 - Indicated in rare situations where disease was only visible on PET/CT (e.g. without anatomic correlate, extensive bone disease that would be difficult to follow with conventional imaging every 6 months for 2 years)
 - All other histologies
 - **NOT** indicated

Pediatric Aggressive Mature B-Cell Lymphomas (includes Burkitt lymphoma, diffuse large B-cell lymphoma, primary mediastinal large B-cell lymphoma, large C-bell lymphoma with IRF4 rearrangement, large B-cell lymphoma with 11q aberration/High grade B-cell lymphoma with 11q aberrations, high grade B-cell lymphoma with MYC and BCL2 or BCL6 rearrangements, B-Lymphoblastic Lymphoma) ⁽²⁶⁾

Most patients with these diseases undergo BOTH conventional imaging with CT scans of the neck, chest, abdomen and pelvis and PET/CT to determine the extent of disease and to monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

NOTE: This portion of the guideline should be applied to patients treated at a pediatric institution on a pediatric protocol which can include young adults into their 20's.

Castleman's Disease ⁽²⁷⁾

This is a rare disorder affecting the lymph nodes and immune system. PET/CT is used to determine the extent of disease and to monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Chronic Lymphocytic Leukemia (CLL) and Small Lymphocytic Lymphoma (SLL) ⁽²⁸⁾

Most patients with this disease do not require routine imaging evaluations to determine and/or monitor the extent of disease (blood tests and bone marrow evaluation are used to monitor disease response). CT scans may be appropriate for the evaluation of symptoms of bulky disease or for assessment of risk of tumor lysis syndrome prior to initiation of therapy. PET/CT is useful to direct nodal biopsy if histologic transformation is suspected (if disease is suspected of evolving from indolent disease into a high-grade lymphoma). Histologic transformation may be evaluated with progressive lymphadenopathy, B symptoms, LDH elevation, or electrolyte disturbances.

- Initial Staging
 - Indicated to direct nodal biopsy if histologic transformation is suspected
- Restaging
 - Indicated to direct nodal biopsy if histologic transformation is suspected **OR**
 - With accelerated CLL (significant increase in lymphocyte count, worsening symptoms)
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated to direct nodal biopsy if histologic transformation is suspected
- Surveillance
 - **NOT** indicated

Chronic Myeloid Leukemia (CML) ⁽²⁹⁾

Most patients with this disease do not require routine imaging evaluations to determine and/or monitor the extent of disease (blood tests and bone marrow evaluation are used to monitor disease response).

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - **NOT** Indicated

Hodgkin Lymphoma (Pediatric and Adult) ^(30,31)

Most patients with disease undergo BOTH conventional imaging with CT scans and pelvis and PET/CT to determine the extent of disease and to monitor response to treatment. Specific indications for CT and PET/CT are detailed in the scenarios below.

- Initial Staging
 - Indicated
 - **NOTE:** Imaging should be performed no more than 4 weeks before starting therapy. In a situation where care has been delayed, repeat initial staging imaging is appropriate.
- Restaging
 - Indicated
 - One repeat PET is appropriate if the end of treatment PET was positive (Deauville Score 4-5)
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated
 - **NOTE:** Imaging studies are only recommended when relapse is suspected or when required based on clinical trial participation, because most patients will clinically declare themselves and there is no survival advantage in pre-emptive imaging. FDG PET/CT is not advised due to risk of false positives in the absence of signs, symptoms, or imaging findings concerning for recurrent disease.

Kaposi Sarcoma ⁽³²⁾

Kaposi sarcoma forms in the lining of the blood and lymph vessels. It typically presents as lesions on the skin and may also affect internal organs such as the digestive tract and lungs. Many patients with this disease do not require routine imaging evaluations to determine and/or monitor the extent of disease. PET/CT is occasionally used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - If there are concerns for coexisting Kaposi sarcoma-associated herpesvirus (KSHV) associated inflammatory cytokine syndrome (KICS), multicentric Castleman disease, or KSHV+ lymphoma
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - If there are concerns for coexisting Kaposi sarcoma-associated herpesvirus (KSHV) associated inflammatory cytokine syndrome (KICS), multicentric Castleman disease, or KSHV+ lymphoma
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - If there are concerns for coexisting Kaposi sarcoma-associated herpesvirus (KSHV) associated inflammatory cytokine syndrome (KICS), multicentric Castleman disease, or KSHV+ lymphoma
- Surveillance
 - **NOT** indicated

Post-Transplant Lymphoproliferative Disease ⁽²⁵⁾

Post-transplant lymphoproliferative disease (PTLD) is a rare but serious complication that can occur after organ or stem cell transplantation. It involves the uncontrolled proliferation of B cells, which can lead to lymphoma. Risk factors for development of PTLD are immunosuppression (higher immunosuppression increases the risk), EBV serostatus (EBV-negative before transplant at higher risk), and the type of transplant (higher risk in lung, heart). Treatment ranges from decreasing immunosuppression to aggressive chemotherapy. For patients who have risk factors for PTLD, PET/CT is an appropriate imaging modality to evaluate for disease, monitor response to treatment, and screen for recurrence given the significantly increased medical complexity in patients who have received previous transplants.

- Initial Staging
 - Indicated for biopsy prove or suspicion of PTLD
- Restaging
 - Indicated
- Pre-surgical evaluation

- N/A
- Recurrence
 - Indicated
- Surveillance
 - Indicated

T Cell Lymphomas ⁽³³⁾

Most patients with disease undergo PET/CT to determine the extent of disease and to monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - Peripheral T-cell lymphomas
 - Indicated every 6 months for 2 years then annually for 5 years
 - Other histologies
 - **NOT** indicated

Waldenstrom Macroglobulinemia/Lymphoplasmacytic Lymphoma ⁽³⁴⁾

This is a rare cancer that is classified as non-Hodgkin lymphoma. Most patients with this disease are followed with imaging studies, using either CT scans or PET/CT at the discretion of the treating provider.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence

- Indicated
- Surveillance
 - **NOT** indicated

Liver & Hepatobiliary Cancers

Ampullary Adenocarcinoma ⁽³⁵⁾

Most patients with this disease undergo conventional imaging with CT chest and abdomen with or without CT pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - In patients without clear evidence of distant metastatic disease on conventional imaging who demonstrate high risk features (e.g. borderline resectable disease, presence of regional adenopathy, suspicion of peritoneal metastases, markedly elevated CA 19-9).
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - To confirm localized disease before proceeding to surgery after completion of CT chest and CT abdomen
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Biliary Tract Cancers ⁽³⁶⁾

Most patients with these diseases undergo conventional imaging with CT Chest and CT Abdomen with or without CT Pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging
- Restaging

- Indicated to clarify inconclusive conventional imaging **OR**
- When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Hepatocellular Carcinoma ⁽³⁷⁾

The diagnosis of this disease can be made on imaging alone or via biopsy. Curative intent treatment for this disease requires surgical resection of sites of disease. For patients who are not candidates for up front surgical resection, liver transplantation is potentially curative. Imaging requests for patients who are receiving systemic therapy, local/regional therapies to control disease, and those awaiting transplant should be reviewed under the 'restaging' indication. Most patients with this disease undergo conventional imaging with multiphase CT or MRI of the liver (ordered as abdomen), CT chest and CT abdomen and pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

NOTE: Follow Restaging indications for patients with known disease who are not receiving active treatment. Use surveillance indications for patients who have completed treatment and have no known active disease.

YTTRIUM-90 (Y90)

Y90 PET SCAN: Indicated when performed immediately after treatment of liver malignancy (primary or metastatic). The Y90 treatment is also the tracer for this and PET is performed within 24 hours of treatment (while Y90 is still detectable) to confirm the final distribution of the Y90.

Lung Cancers

Non-Small Cell Lung Cancer ⁽³⁸⁾

NSCLC is the most common type of lung cancer and includes multiple histologies (adenocarcinoma, squamous cell carcinoma, large cell carcinoma). Treatment depends largely on the stage of disease and is typically multimodal, including chemotherapy, surgery, radiation therapy, and immunotherapy. Most patients with disease undergo both conventional imaging with CT of the chest and MRI of the brain as well as PET/CT to determine the extent of treatment and to monitor for response to treatment. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated
- Restaging
 - Indicated for **ANY** of the following:
 - Pre- and post-radiation evaluation **OR**
 - Evaluation prior to starting maintenance immunotherapy **OR**
 - To clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging **OR**
 - End of treatment evaluation (prior to transitioning to surveillance)
- Pre-surgical evaluation
 - Indicated
 - Chest CT is indicated in addition to PET
- Recurrence
 - Indicated
 - Brain MRI is indicated in addition to PET
- Surveillance
 - **NOT** indicated

Small Cell Lung Cancer ⁽³⁹⁾

SCLC is the less common type of lung cancer and is aggressive, tending to spread quickly to lymph nodes, bones, brain, and liver. Treatment depends largely on the stage of disease (limited stage, cancer confined to one side of the chest; extensive stage - cancer has spread to the other lung and/or other parts of the body) and is typically multimodal, including chemotherapy, radiation therapy, and immunotherapy. Most patients with this disease undergo conventional imaging with CT Chest, CT Abdomen & Pelvis, and MRI of the brain. PET/CT has been shown to upstage many patients. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial staging (all patients)
 - Indicated if conventional imaging does not obviously demonstrate extensive stage disease **OR**
 - To clarify inconclusive conventional imaging that would clarify limited versus extensive stage disease and/or change the treatment plan
- Restaging
 - Indicated for limited stage disease **OR**
 - Prior to chest radiation **OR**
 - To clarify inconclusive conventional imaging
- Pre-surgical evaluation
 - Indicated for limited stage disease **OR**
 - To clarify inconclusive conventional imaging
- Recurrence
 - Indicated if conventional imaging does not obviously demonstrate extensive stage disease **OR**
 - To clarify inconclusive conventional imaging
- Surveillance
 - **NOT** indicated

Lung Nodules ⁽⁴⁰⁾

When a lung nodule is seen on low dose CT (or standard Chest CT without known malignancy), PET is indicated for **ANY** of the following:

- If the solid component of the dominant nodule (either solitary or clearly dominant) is $\geq 8\text{mm}$ **OR**
- If there is a part solid/mixed nodule with the solid component 6 mm or larger **OR**
- If there is a mixed nodule (i.e., ground glass and solid nodule) with the solid component of the nodule $\geq 4\text{mm}$ on LDCT when there has been **EITHER**

- Interval growth of the solid component of at least 1.5mm **OR**
- Interval development of a new mixed nodule with the solid nodule component $\geq 4\text{mm}$

Neuroendocrine & Adrenal Tumors ⁽⁴¹⁾

Adrenocortical Carcinoma

Adrenocortical Carcinoma (ACC) is a rare, aggressive cancer that is often characterized by excessive hormone production leading to symptoms such as hypertension, weight gain, and virilization. ACC is often diagnosed on imaging rather than biopsy. Features of an adrenal mass on conventional imaging in a patient with no history of another primary malignancy that are suspicious for adrenocortical carcinoma include: size $> 4\text{ cm}$ and a homogenous mass with irregular margins and/or local invasion. Most patients with this disease undergo conventional imaging with CT scans of the chest, abdomen and pelvis. PET/CT is used to supplement conventional imaging in the scenarios described below.

- **FDG PET**
 - Adrenal (other than pheochromocytoma/paranglioma)
 - Initial Staging:
 - Indicated (biopsy confirmed and suspected based on imaging)
 - Restaging:
 - Localized resectable disease
 - ◆ Indicated to clarify inconclusive conventional imaging
 - Locoregional unresectable or metastatic disease
 - ◆ Indicated
 - Pre-surgical evaluation
 - Indicated
 - Recurrence
 - Completely resected disease
 - ◆ With symptoms, laboratory or imaging findings of recurrence
 - Unresected disease:
 - ◆ Indicated
 - Surveillance
 - Completely resected disease:
 - ◆ NOT indicated (followed with conventional imaging)
 - Unresectable or metastatic disease:
 - ◆ Indicated every 3-6 months for up to 5 years

Paraganglioma and Pheochromocytoma

These are neuroendocrine tumors that require both conventional imaging with CT or MRI of areas of disease and functional imaging with FDG or SSTR PET/CT. Abdomen MRI (to evaluate the liver) is appropriate in addition to PET/CT at all time points. Treatment typically involves surgical resection of the tumor with pre-operative medical preparation to manage hormone levels. Both SSTR (Dotatate) PET and FDG PET are used in rare circumstances and can be considered on a case-by-case basis.

- **FDG PET or Special Tracer SSTR (Dotatate) PET**
 - Initial Staging
 - Indicated when there is a high clinical suspicion based on imaging and biochemical evaluation prior to biopsy **OR**
 - For biopsy proven disease
 - Restaging
 - Completely resected disease:
 - Indicated to clarify inconclusive conventional imaging
 - Unresected disease:
 - Indicated
 - Pre-surgical evaluation
 - Indicated
 - Recurrence
 - Completely resected disease
 - With symptoms, laboratory or imaging findings of recurrence
 - Unresected disease:
 - Indicated
 - Surveillance
 - Completely resected disease:
 - **NOT** indicated (followed with conventional imaging)
 - Unresectable disease:
 - Indicated every 3-6 months

Well-Differentiated Neuroendocrine Tumors (NET)

Surgical resection of primary and metastatic sites of disease is a mainstay of treatment for well-differentiated NETs. Conventional imaging of primary sites of disease in addition to functional imaging with SSTR PET/CT is used for all patients to determine the extent of disease. SSTR PET/CT is used more extensively throughout treatment for individuals with unresected or metastatic disease. FDG PET/CT is used in select patients. SSTR (Dotatate) PET plus FDG

PET are used in rare circumstances and can be considered on a case-by-case basis. SSTR PET/CT to evaluate for possible NET based on labs and/or symptoms can be considered on a case-by-case basis.

Special Tracer SSTR (Dotatate) PET

- Initial Staging:
 - Indicated
 - Abdomen MRI (liver) is indicated in addition to PET
- Restaging:
 - Completely resected disease:
 - Indicated to clarify inconclusive conventional imaging
 - Unresected disease:
 - Indicated
- Pre-surgical evaluation:
 - Indicated
 - Abdomen MRI (liver) is indicated in addition to PET
- Recurrence:
 - Completely resected disease
 - With symptoms, laboratory or imaging findings of recurrence
 - Unresected disease:
 - Indicated
- Surveillance:
 - Completely resected disease:
 - **NOT** indicated (followed with conventional imaging)
 - Unresectable disease:
 - Indicated every 3-6 months

FDG PET

- Initial Staging:
 - Indicated for high-grade well-differentiated NET **AND**
 - With a high Ki67 ($\geq 55\%$) **AND**
 - Negative initial staging SSTR PET
- Restaging:
 - Indicated with
 - Recent negative SSTR PET **OR**

- Prior positive FDG PET
- Pre-surgical evaluation
 - Indicated with
 - Recent negative SSTR PET **OR**
 - Prior positive FDG PET
- Recurrence
 - Indicated with
 - Recent negative SSTR PET **OR**
 - Prior positive FDG PET
- Surveillance
 - Completely resected disease:
 - **NOT** indicated (followed with conventional imaging)
 - Unresectable disease:
 - Indicated every 3-6 months

Poorly Differentiated Neuroendocrine Tumors

Poorly differentiated neuroendocrine tumors (NECs) are aggressive, high-grade malignancies characterized by rapid growth and a tendency to metastasize. Most patients undergo conventional imaging to assess the primary site of disease and FDG PET/CT to determine the extent of disease and response to treatment. Treatment often includes a combination of chemotherapy, targeted therapy, and emerging options like immunotherapy and peptide receptor radionuclide therapy (PRRT). Both SSTR (Dotatate) PET and FDG PET are used in rare circumstances and can be considered on a case-by-case basis.

This portion of the guideline addresses extrapulmonary poorly differentiated (large or small cell carcinoma/mixed neuroendocrine-non-neuroendocrine neoplasms, large cell neuroendocrine carcinoma of the lung, mixed neuroendocrine tumors, extra-pulmonary small cell carcinoma (i.e. primary site of disease is not in the lung)). See **small cell lung cancer** for primary site of disease in the lung. See **cervical cancer** for primary site of disease in the cervix. See **prostate cancer** for primary site of disease in the prostate.

- **FDG PET**
 - Initial Staging
 - Indicated
 - Restaging
 - With prior indeterminate imaging **OR**
 - With symptoms, laboratory or imaging findings of progression
 - Pre-surgical evaluation

- Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated
- **Special Tracer SSTR (Dotatate) PET**
 - Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - **NOT** Indicated

Non-Malignant Disease

Dementia ^(42–44)

- Special Tracer PET
 - Amyloid PET for evaluation for mild cognitive impairment or dementia in the following situations:
 - Detection of early Alzheimer's disease **OR**
 - Differentiation between Alzheimer's, dementia with Lewy body disease (DLB) and frontotemporal lobar degeneration (FTD) **OR**
 - Assessment for the presence of beta amyloid plaque in Alzheimer's disease when being considered for treatments that target beta-amyloid plaque

AND ALL the following criteria are met (criteria apply to **ANY** of the above 3 indications):

- Brain MRI is insufficient or indeterminant **AND**
- Objective measures demonstrate objective impairment (MMSE/MoCA < 26 or mild cognitive impairment on neuropsychological testing) **AND**
- Full lab evaluation (thyroid function tests, CBC, CMP including LFTs and B12) has been completed and if abnormal, have been treated and cognitive difficulty persists **AND**
- Medication side effects ⁽⁴⁴⁾ and medical causes, such as vascular or traumatic or inflammatory etiologies have been excluded

NOTE: Brain CT is an alternative to brain MRI when MRI is contraindicated or cannot be performed for detection and differentiation but **NOT** for treatment planning as MRI is a prerequisite to beta-amyloid targeted treatment

Sarcoidosis ^(45,46)

- Known sarcoidosis:
 - **ONLY** if conventional testing (CXR, CT and inflammatory serology) are indeterminate for known sarcoid to determine:

- If treatment might be helpful **OR**
- Extent of disease, if it will potentially change management **OR**
- Response to treatment
- Suspected sarcoidosis:
 - To determine most suitable site to biopsy

Vasculitis

- In limited circumstances for patients with known vasculitis, PET is indicated after conventional imaging (MRA/CTA/MR/CT) is insufficient to determine treatment ⁽⁴⁷⁾

Other Malignancies

Histiocytic Neoplasms ⁽⁴⁸⁾

Histiocytic neoplasms are rare hematologic disorders characterized by the accumulation of neoplastic histiocytes. These disorders vary widely in their clinical presentation and prognosis, ranging from localized and mild to disseminated and potentially fatal. PET/CT is used to determine the extent of disease, to monitor response to treatment and to evaluate for recurrent disease after completion of treatment. CT or MRI of the primary site(s) of disease are sometimes used in addition to or in place of PET/CT.

- Langerhan's cell histiocytosis, Erdheim Chester disease, Rosai-Dorfman disease
 - Initial Staging
 - Indicated
 - Restaging
 - Indicated
 - Pre-surgical evaluation
 - Indicated
 - Recurrence
 - Indicated
 - Surveillance
 - Every 3-6 months for 2 years then annually

Melanoma: Uveal ⁽⁴⁹⁾

Uveal melanoma is a rare type of melanoma that originates in the uvea (iris, ciliary body, choroid). Most patients with this disease undergo conventional imaging evaluation with MRI of the orbit and CT or MRI of the chest, abdomen and pelvis (The primary sites of metastases are liver and lung). PET/CT is occasionally used to supplement conventional imaging in the scenarios described below.

- Initial Staging

- Indicated to clarify indeterminate conventional imaging
- Restaging
 - Indicated to clarify indeterminate conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify indeterminate conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Recurrence
 - Indicated to clarify indeterminate conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Merkel Cell Carcinoma ⁽⁵⁰⁾

Merkel cell carcinoma is a rare and aggressive type of skin cancer that originates in the epidermis. Imaging is encouraged for staging of most cases as occult metastases result in upstaging in a significant number of patients. PET/CT is used to determine the extent of disease and to monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - Surveillance imaging is typically performed using CT scans. PET/CT can be used to evaluate for in-transit metastases if the primary lesion is on the extremity at the discretion of the ordering provider.

Mesothelioma: Peritoneal ⁽⁵¹⁾

Peritoneal mesothelioma is a rare and aggressive cancer that develops in the peritoneum. It is primarily caused by exposure to asbestos fibers. PET/CT is used to determine the extent of disease and to monitor response to treatment.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Mesothelioma: Pleural ⁽⁵²⁾

Pleural mesothelioma is a rare and aggressive cancer that develops in the pleura. It is primary caused by exposure to asbestos fibers. PET/CT is used to determine the extent of disease and to monitor response to treatment. Chest CT is appropriate in addition to PET/CT. The evaluation of recurrent pleural effusion and/or pleural thickening includes CT chest, thoracentesis and pleural biopsy. The diagnostic sensitivity of this investigation is 70-75%. If the first biopsy is non-diagnostic, there is a higher chance that subsequent biopsies will be non-diagnostic, thus a PET to guide subsequent biopsy is reasonable in this situation.

- Initial Staging
 - Indicated
- Restaging
 - Indicated
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Neuroblastoma ⁽⁵³⁾

Neuroblastoma is a rare cancer that develops from neuroblasts and is seen primarily in young children. Primary tumors are commonly found in the adrenal glands, abdomen, chest, neck, and pelvis. Metastatic disease is commonly seen in the bone marrow, bones, liver, lymph nodes, skin and brain. Patients with this disease undergo many imaging studies to define primary and metastatic sites of disease as even patients with widely metastatic disease are treated with

curative intent. Routine imaging studies include CT or MRI of the primary tumor site, chest, abdomen and pelvis, and brain. These tumors often encase vasculature, necessitating CTA or MRA in addition to the above imaging. These tumors also invade neural foramina, necessitating dedicated spine imaging. Functional imaging with Iodine 123 (123I-MIBG) is routinely used given the high specificity and sensitivity to identify metastatic disease. When tumors are not MIBG avid, or when MIBG imaging and anatomic imaging do not correlate, FDG PET/CT is appropriate. Treatment is multimodal including chemotherapy, surgery, radiation, autologous stem cell transplant and immunotherapy. Treatment decisions are sometimes made at the granular level of individual metastatic disease sites, warranting explicit characterization of all sites of disease. Due to the complexity of these tumors, the intensity and complexity of treatment, and the young age of patients requiring sedation for imaging, multiple overlapping imaging studies and modalities are often necessary.

- Initial Staging
 - Indicated when any disease is not avid on MIBG scan, **OR**
 - If there are discordant findings between MIBG scan and anatomic imaging (e.g. concerning area of disease on MIBG scan without anatomic correlate on conventional imaging, or concerning area of disease on conventional imaging without anatomic correlate on MIBG scan).
- Restaging
 - Indicated when FDG PET was used for initial staging **OR**
 - When any disease is not avid on MIBG scan, **OR**
 - If there are discordant findings between MIBG scan and anatomic imaging (e.g. concerning area of disease on MIBG scan without anatomic correlate on conventional imaging, or concerning area of disease on conventional imaging without anatomic correlate on MIBG scan) **OR**
 - If MIBG has become indeterminate or discordant
- Pre-surgical evaluation
 - Indicated when FDG PET was used for initial staging **OR**
 - When any disease is not avid on MIBG scan, **OR**
 - If there are discordant findings between MIBG scan and anatomic imaging (e.g. concerning area of disease on MIBG scan without anatomic correlate on conventional imaging or concerning area of disease on conventional imaging without anatomic correlate on MIBG scan) **OR**
 - If MIBG has become indeterminate or discordant
- Recurrence
 - Indicated when FDG PET was used for initial staging **OR**
 - When any disease is not avid on MIBG scan, **OR**
 - If there are discordant findings between MIBG scan and anatomic imaging (e.g. concerning area of disease on MIBG scan without anatomic correlate on

conventional imaging or concerning area of disease on conventional imaging without anatomic correlate on MIBG scan) **OR**

- If MIBG has become indeterminate or discordant
- Surveillance
 - If PET is used for functional imaging evaluation in place of MIBG during treatment, surveillance PET is appropriate every 3-6 months for 1 year, then every 6 months for 1 year, then annually

Occult Primary ⁽⁵⁴⁾

An occult primary tumor is a type of cancer where the primary tumor site cannot be identified. Metastatic cancer cells have been identified somewhere in the body, however the location where the cancer started remains unknown. The workup in this situation requires biopsy to determine histology (e.g. adenocarcinoma vs squamous cell carcinoma) of the occult primary and some combination of conventional imaging studies and diagnostic procedures (e.g. CT scans of the chest, abdomen and pelvis, mammogram, colonoscopy). PET/CT is occasionally used following biopsy and initial workup to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging
 - **NOTE:** See **Head and Neck Cancer** section for occult primary in the lymph nodes of the neck
- Restaging
 - Follow indications based on how cancer is being treated (e.g. if treating as head and neck, defer to head and neck cancer guidance for all future requests).
- Pre-surgical evaluation
 - Follow indications based on how cancer is being treated (e.g. if treating as head and neck, defer to head and neck cancer guidance for all future requests).
- Recurrence
 - Follow indications based on how cancer is being treated (e.g. if treating as head and neck, defer to head and neck cancer guidance for all future requests).
- Surveillance
 - **NOT** indicated

Thymomas & Thymic Carcinomas ⁽⁵⁵⁾

Most patients with these diseases undergo imaging with CT scan of the chest and PET/CT to determine the extent of disease and response to treatment.

- Initial Staging:
 - Indicated (biopsy not needed, can approve based on suspicion of this diagnosis on

chest CT)

- Restaging:
 - Indicated
- Pre-surgical evaluation:
 - Indicated
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Thyroid Carcinoma ⁽⁵⁶⁾

Papillary, Follicular, Oncocytic and Poorly Differentiated:

Differentiated thyroid carcinomas (papillary, follicular, oncocytic thyroid carcinomas (poorly differentiated and differentiated)) can concentrate iodine, express TSH receptors and produce thyroglobulin (Tg). Most patients with this disease undergo whole body iodine imaging (I-123 or I-131) when there is a suspicion of disease or confirmed disease. PET/CT has limited uses in these types of thyroid cancer unless the disease is non-iodine avid or has a high likelihood of not being iodine avid, PET/CT is used to supplement other imaging in the scenarios described below:

- Initial Staging:
 - **NOT** Indicated
- Restaging Following Total/Completion Thyroidectomy and/or Radioiodine Ablation (RAI) for **ANY ONE** of the following:
 - With known or suspected metastases (based on laboratory or imaging findings) **AND** I-123/131 is negative
 - With rising or new Tg Antibody
 - **Oncocytic** thyroid cancer following thyroidectomy if **ANY** of the following are present:
 - Tumor > 2 cm
 - ≥ 1 focus of vascular invasion
 - Any positive lymph node (≥ cN1)
 - Positive margin
 - Gross residual disease (including extension outside the thyroid)
 - Postop Tg ≥ 1 ng/mL
- Pre-surgical evaluation

- **NOT** indicated
- Recurrence:
 - Indicated when recurrence is suspected based on laboratory or imaging findings **AND**
 - I-123/131 is negative (or was previously negative in the setting of known disease)
- Surveillance
 - **NOT** indicated

Anaplastic or De-Differentiated:

Anaplastic thyroid cancer (ATC) is a highly aggressive form of thyroid malignancy, characterized by rapid growth and a high propensity for metastasis. These tumors are not typically iodine avid. Most patients with this disease undergo conventional imaging and PET/CT to define the extent of disease and to monitor response to treatment

- Initial Staging:
 - Indicated
- Restaging:
 - Indicated
- Pre-surgical evaluation:
 - Indicated
- Recurrence:
 - Indicated
- Surveillance:
 - Indicated 3-6 months after initial therapy

Medullary:

Medullary Thyroid Carcinoma (MTC) arises from the neuroendocrine parafollicular C cells of the thyroid and is often associated with elevated calcitonin levels. This type of thyroid cancer can be sporadic or linked with multiple endocrine neoplasia type 2 (MEN2). Most patients with this disease undergo imaging with ultrasound of the neck. SSTR PET/CT is used to supplement conventional imaging in the situations described below:

- **Special Tracer SSTR (dotatate) PET:**
 - Initial Staging:
 - Indicated
 - Restaging:
 - Indicated when tumor markers (calcitonin and/or CEA) are rising **AND**

- Conventional imaging is negative
- Pre-surgical evaluation:
 - Indicated
- Recurrence:
 - Indicated when tumor markers (calcitonin and/or CEA) are rising **AND**
 - Conventional imaging is negative
- Surveillance:
 - **NOT** indicated
- FDG PET
 - Initial Staging:
 - **NOT** indicated
 - Restaging:
 - **NOT** indicated
 - Pre-surgical evaluation
 - **NOT** indicated
 - Recurrence
 - Indicated when tumor markers (calcitonin and/or CEA) are rising **AND**
 - Conventional imaging is negative
 - Surveillance
 - **NOT** indicated

Wilms Tumor ⁽⁵⁷⁾

Wilms tumor (nephroblastoma) is a rare kidney cancer that primarily affects children. Most patients with this disease undergo conventional imaging with CT scans of the chest, abdomen and pelvis. PET/CT is occasionally used to supplement conventional imaging in the scenarios described below.

- Initial Staging:
 - Indicated to clarify inconclusive conventional imaging
- Restaging:
 - Indicated to clarify inconclusive conventional imaging
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging
- Recurrence
 - Indicated to clarify inconclusive conventional imaging

- Surveillance
 - **NOT** indicated

Pancreatic Cancer ⁽⁵⁸⁾

Most patients with this disease undergo conventional imaging with CT chest, abdomen and pelvis, and CT or MRI of the pancreas with a dedicated pancreatic protocol. PET/CT is used to supplement conventional imaging in the scenarios described below.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - In patients without clear evidence of distant metastatic disease on conventional imaging who demonstrate high risk features (e.g. borderline resectable disease, presence of regional adenopathy, suspicion of peritoneal metastases, markedly elevated CA 19-9). The purpose of the PET/CT is to detect extra-pancreatic metastases that would change management strategy.
- Restaging
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Pre-surgical evaluation
 - Indicated
- Recurrence
 - Indicated to clarify inconclusive conventional imaging **OR**
 - When previous PET/CT demonstrated disease not seen on conventional imaging
- Surveillance
 - **NOT** indicated

Plasma Cell Dyscrasias

Plasma Cell Dyscrasias

Plasma cell dyscrasias are a group of disorders characterized by the abnormal proliferation of plasma cells, which are a type of white blood cell responsible for producing antibodies. The M-protein is an abnormal immunoglobulin produced by a single clone of plasma cells and can be detected in the blood or urine via protein electrophoresis (SPEP or UPEP). Monoclonal gammopathy of undetermined significance (MGUS), smoldering multiple myeloma (SMM), and multiple myeloma are stages in the spectrum of plasma cell disorders. MGUS is characterized by <10% clonal plasma cells in the bone marrow and is observed without treatment. Smoldering multiple myeloma is characterized by 10-60% clonal plasma cells in the bone marrow and has a higher risk of progression to multiple myeloma. Multiple myeloma is characterized by >10% clonal plasma cells in the bone marrow with myeloma-defining events. Myeloma-defining events are any of the following: 1. $\geq 60\%$ clonal plasma cells in the bone marrow; 2. serum

involved/uninvolved free light chain ratio of 100 or greater; 3. more than one focal lesion on MRI that is at least 5mm in size; 4. Hypercalcemia; 5. renal insufficiency; 6. Anemia; or 7. bone lesions.

MGUS ⁽⁵⁹⁾

- Initial Staging, Restaging, Pre-surgical evaluation, Recurrence, Surveillance
 - **NOT** Indicated

NOTE: Whole Body Low Dose CT (CPT 76497) is used rather than PET - see Evolent Clinical Guideline 2061 for Unlisted Studies under Unlisted CT

Multiple Myeloma ⁽⁵⁹⁾

Treatment for multiple myeloma is divided into two phases: active and maintenance treatment. Active treatment is given at the onset of disease or during relapse and is more aggressive. The primary goal of active treatment is to reduce tumor burden and induce remission using chemotherapy, stem cell transplant, radiation therapy, and immunotherapy. Maintenance treatment is given after achieving remission, is less intensive, and is long term. The goal of maintenance therapy is to prolong remission. PET/CT is used during active treatment to evaluate the extent of disease at diagnosis and to monitor response to treatment. It is used less frequently in maintenance treatment. Nuanced scenarios are detailed below.

- Initial Staging:
 - Indicated
- Restaging
 - Active treatment
 - Indicated every 2-3 cycles of therapy, during evaluation for stem cell transplantation or CAR-T therapy, and at 1, 3, 6 and 12 months post-transplant or CAR-T
 - Maintenance treatment:
 - Indicated annually (including for patients who do not have measurable levels of M protein or free light chains)
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated at any phase in treatment or surveillance with signs, symptoms, lab or imaging studies concerning for recurrence
- Surveillance:
 - Indicated annually (including for patients who do not have measurable levels of M protein or free light chains)

Smoldering Myeloma (suspected or confirmed) ⁽⁵⁹⁾

Patients with suspected or confirmed smoldering myeloma based on bone marrow evaluation should undergo imaging evaluation to look for lesions that would meet criteria for the diagnosis of multiple myeloma. PET/CT is a commonly used modality to evaluate for bone lesions at diagnosis and annually to monitor for progression to active myeloma.

- Initial Staging:
 - Indicated
- Restaging:
 - N/A
- Pre-surgical evaluation:
 - N/A
- Recurrence
 - Indicated with signs, symptoms or lab values suggestive of progression to multiple myeloma
- Surveillance
 - Indicated annually due to risk of progression to multiple myeloma

Solitary Plasmacytoma ⁽⁵⁹⁾

There are two types of plasmacytoma - solitary plasmacytoma of bone (SPB) and extramedullary plasmacytoma (EMP). Both have a risk of progression to multiple myeloma (50% for SPB, 15% for EMP). PET/CT is used to evaluate the disease at diagnosis. Treatment is often with radiation and less frequently surgery. Even after successful treatment, there remains a significant risk of progression to multiple myeloma warranting PET/CT in the surveillance setting.

- Initial Staging:
 - Indicated
- Restaging:
 - Indicated
- Pre-surgical evaluation:
 - Indicated
- Restaging:
 - Indicated with signs, symptoms, or lab values suggestive of progression to multiple myeloma
- Surveillance:
 - Indicated once within 3-12 months post-treatment then annually for 5 years

Systemic Light Chain Amyloidosis ⁽⁶⁰⁾

This disease (also known as AL amyloidosis or primary amyloidosis) is a rare and serious condition where light chains accumulate in various organs and tissues. Patients with this disease may undergo conventional imaging to determine organ involvement (e.g. heart, chest). FDG PET/CT is used to determine the extent of disease in some patients and can be used following biopsy confirmation of disease or with high clinical suspicion based on labs, symptoms and other imaging findings.

- Initial Staging:
 - Indicated
- Restaging:
 - Indicated
- Pre-surgical evaluation
 - N/A
- Recurrence
 - Indicated
- Surveillance
 - **NOT** indicated

Skin Cancers

Basal Cell Skin Cancer ⁽⁶¹⁾

Most patients with this disease do not undergo imaging evaluations. Conventional imaging is indicated for high risk locally advanced disease, regional disease, or metastatic disease at the discretion of the treating provider. PET/CT is used in rare circumstances to supplement conventional imaging when needed to determine a treatment plan.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Restaging
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Recurrence
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment

- Surveillance
 - **NOT** indicated

Melanoma: Cutaneous ⁽⁶²⁾

The need for and type of imaging evaluations for this disease vary depending on the stage of the disease. Most patients with stage I and II melanoma (based on pathologic evaluation of the biopsy) do not undergo advanced imaging evaluations. Conventional imaging with CT or MRI of the affected area is indicated for stage I and II melanoma when needed for surgical planning. CT scans of the chest, abdomen and pelvis are indicated if there are specific signs or symptoms suggesting disease spread. In stage I and II patients, PET/CT is not used. It can be considered on a case-by-case basis to supplement conventional imaging. In stage III (Any T, N1 or higher) and stage IV patients, systemic imaging to determine the extent of disease and to monitor response to treatment is appropriate. PET/CT is widely used in patients with stage III and IV melanoma to determine the extent of disease and monitor response to systemic treatment. PET/CT has additional nuanced indications described in the scenarios detailed below.

- Initial Staging
 - Stage I
 - **NOT** indicated
 - Stage II
 - Indicated to clarify inconclusive conventional imaging
 - Stage III/IV
 - Indicated
- Restaging
 - Stage I
 - **NOT** indicated
 - Stage II
 - Indicated to clarify inconclusive conventional imaging
 - Stage III/IV
 - Indicated
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging
- Recurrence
 - True scar recurrence (persistent disease)
 - Indicated to clarify inconclusive conventional imaging
 - Satellite, in-transit recurrence, nodal or metastatic recurrence
 - Indicated

- Surveillance
 - Stage I
 - **NOT** indicated
 - Stage II
 - Indicated to clarify inconclusive conventional imaging
 - Stage III/IV
 - Indicated annually for 5 years
 - **NOTE:** if additional cross-sectional imaging needed at more frequent intervals in surveillance setting, recommend alternating CT or MRI with PET/CT.

Squamous Cell Skin Cancer ⁽⁶³⁾

Most patients with this disease do not undergo imaging evaluations. Conventional imaging is indicated for suspicion of locally, extensive or metastatic at the discretion of the treating provider. PET/CT is used in rare circumstances to supplement conventional imaging when needed to determine a treatment plan.

- Initial Staging
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Restaging
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Pre-surgical evaluation
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Recurrence
 - Indicated to clarify inconclusive conventional imaging when needed to direct treatment
- Surveillance
 - **NOT** indicated

LEGISLATIVE LANGUAGE

Washington

20181116B – Positron Emission Tomography (PET) scans for lymphoma ⁽⁶⁴⁾

Washington State Health Care Authority Health Technology Assessment

Health Technology Clinical Committee

Findings and Decisions

HTCC Coverage Determination

- PET scans (i.e., PET with computed tomography or PET/CT) for lymphoma is a covered benefit with conditions.

HTCC reimbursement determination

- **Limitations of Coverage**
 - An initial staging scan is covered followed by up to three (3) scans per active occurrence of lymphoma:
 - When used to assess a response to chemotherapy, scans should not be done any sooner than three (3) weeks after completion of any chemotherapy cycle, except for advanced stage Hodgkin's lymphoma, after four (4) cycles of ABVD chemotherapy.
 - When used to assess response to radiation therapy, scans should not be done any sooner than eight (8) weeks after completion of radiation or combined chemotherapy and radiation therapy.
 - Relapse: Covered when relapse is suspected in the presence of clinical symptoms or other imaging findings suggestive of recurrence

Non-Covered indicators:

Surveillance: Not covered

Arkansas ⁽⁶⁵⁾

APPLICABLE LOB: COMMERCIAL AND EXCHANGE

- Arkansas State
 - State of Arkansas 93rd General Assembly Regular Session 2021 House Bill 1357 an act to continue care for the protection of cancer survivors; concerning coverage for Positron Emission Tomography under a health benefit plan to screen for or diagnose cancer in certain patients; and for other purposes. Arkansas Code Title 23, Chapter 79, Subchapter 1, is amended to add an additional section to read as follows: 25 23-79-164. Coverage for positron emission tomography:
 - A healthcare insurer that offers a health benefit plan in this state shall provide coverage for positron emission tomography to screen for or to diagnose cancer in a patient upon the recommendation of the patient's physician when the patient has a prior history of cancer (subsection (b))
 - Benefits under subsection (b) of this section are subject to any health benefit plan provisions that apply to other services covered by the health benefit plan

CODING AND STANDARDS

Codes

78811, 78812, 78813, 78814, 78815, 78816

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

PSMA

- Any of the following criteria make PSMA PET indicated for initial staging:
 - Gleason score 8, 9 or 10
 - Primary pattern 4 (Gleason 4+3=7)
 - PSA > 20 **AND** Gleason score 3+3=6 or higher
 - PSA > 10 **AND** Gleason score 3+4=7
 - PSA > 10 **AND** Gleason score 3+3=6 **AND** clinical stage $\geq$ T2b
 - Clinical stage $\geq$ T3a **AND** Gleason score 3+3=6 or higher
 - Clinical stage $\geq$ T2b **AND** Gleason score 3+4=7 or higher
 - $\geq$ 50% of cores positive for cancer in a random, non-targeted prostate biopsy
 - Grade group 3, 4 or 5 disease

Definitions

- INITIAL STAGING** refers to imaging that is performed after the diagnosis of cancer is made, and generally before any treatment.
- RETAGING** refers to imaging that is performed during treatment to determine response to treatment/monitor treatment, a single end of treatment study done within 6 months of completion of treatment, or when there is clinical concern for recurrence (i.e., new

imaging, new signs, rising labs/tumor markers or symptoms relative to type of cancer and entire clinical picture). Recurrence is not required to be biopsy proven.

- Imaging is typically performed 6-12 weeks after surgery
- Imaging is typically performed 12 weeks after radiation (to avoid false positive findings that can be caused by treatment changes or healing).
 - PET/CT can be performed 1 - 3 weeks after neoadjuvant chemotherapy or neoadjuvant chemoradiation if done for presurgical planning to evaluate for distant metastatic disease or to evaluate known metastatic disease located in areas separate from the site(s) being radiated.
- When an end of treatment PET scan performed at an appropriate post-treatment interval (see above) shows indeterminate findings, one additional repeat PET in 3 months is indicated.
- Common exceptions are noted in the guideline. If not noted in the guideline, a valid clinical reason explaining why the interval needs to be shorter is needed.
- **TREATMENT** includes chemotherapy, immunotherapy, radiation, as well as patients on “maintenance therapy” who have known, or existing, metastatic disease being controlled by this treatment. Allogenic bone marrow transplant and CART T-cell therapy should be considered ‘active’ treatment for at least 6 months after infusion/transplant and as such can be approved at 30 days, 100 days, and 6 months after the most recent infusion.
- **INDETERMINATE IMAGING:**
 - When indeterminate imaging is required prior to PET, this typically means conventional imaging (CT, MRI, OR Nuclear Medicine Scan (i.e. bone scan)) shows a finding that is indeterminate **AND** clarification of that finding with PET will potentially change management.
 - The information provided should clearly explain why conventional imaging is insufficient to determine treatment or management.
 - Biopsy guidance:
 - To determine the best location to biopsy either within a tumor that has necrosis on imaging **OR**
 - To determine the best location to biopsy when there are findings on standard imaging that would require a significantly invasive procedure (such as laparoscopic or open surgical procedures) **AND** malignancy is highly suspected based on imaging.
 - When previous conventional imaging has been shown to be negative, yet a concurrent PET scan was positive (i.e. conventional imaging was falsely negative/ missed lesions seen on PET), we do not require repeat conventional imaging prior to every subsequent PET because conventional imaging was already shown to be insufficient. Appropriate interval criteria should still be met.

Further Information

PET with CONTRAINDICATIONS to contrasted CT AND MRI: The inability to image with contrasted conventional imaging includes contraindications to both CT (such as chronic renal failure with GFR < 30 **OR** significant iodinated contrast allergy) **AND** to MRI (such as gadolinium allergy, implanted device that is not MRI compatible, or GFR <40). When requested for surveillance due to the above reasons, PET can be considered during the time that the highest risk of recurrence for that cancer (typically the first two years after completion of treatment).

PET/MR: When PET/MR can be considered per the guideline, if the criteria are met for PET for that cancer and the plan is to do a PET/MR rather than a PET/CT, the PET scan can be approved. In the same way a separate approval for total body CT is not needed when a PET/CT is requested, a separate approval for the total body MR is not typically needed. However, until a PET/MR CPT code is implemented, unlisted MR in addition to PET can be considered on a case-to-case basis.

SUMMARY OF EVIDENCE

PET scans are generally indicated for biopsy-proven cancer or strongly suspected cancer based on other diagnostic testing. The appropriateness of a PET/CT study depends on the type of cancer and the radiopharmaceutical used.

- **Bone Tumors & Sarcomas** ^(1,2): PET/CT is indicated for initial staging, restaging, pre-surgical evaluation, and recurrence in cases like angiosarcoma, clear cell sarcoma, epithelioid sarcoma, Ewing sarcoma, myxoid/round cell liposarcoma, and osteosarcoma. However, it is not indicated for chondrosarcoma and giant cell tumor of bone.
- **Breast Cancer** ⁽³⁾: For stage I and II breast cancer, PET/CT is rarely needed and can be considered on a case-by-case basis. For stage III and IV, it is used to supplement conventional imaging.
- **CNS Cancers** ⁽⁴⁾: PET/CT is used for primary CNS lymphoma and meningioma to determine the extent of disease and monitor response to treatment.
- **Gastrointestinal Tract Cancers** ^(6,7,10): PET/CT is indicated for various gastrointestinal cancers like anal carcinoma, colon cancer, esophageal cancer, gastric cancer, gastrointestinal stromal tumors, rectal cancer, and small bowel adenocarcinoma to clarify inconclusive conventional imaging and evaluate for metastatic disease.
- **Genitourinary Cancers** ^(12,14,15): PET/CT is indicated for muscle-invasive bladder cancer, prostate cancer, and penile cancer to verify staging, clarify inconclusive imaging, and evaluate for metastatic disease.
- **Gynecological Cancers** ^(19,20): PET/CT is used for cervical cancer, uterine neoplasms, gestational trophoblastic neoplasia, ovarian cancer, and vulvar cancer to determine the extent of disease, monitor response to treatment, and evaluate for recurrence.
- **Head & Neck Cancer** ⁽²¹⁾: PET/CT is indicated for initial staging, restaging, pre-surgical evaluation, and recurrence.

- **Leukemias & Lymphomas** ^(22,23,25,26,28,30,31,33,34): PET/CT is used for various types of leukemias and lymphomas to determine the extent of disease and monitor response to treatment.
- **Liver & Hepatobiliary Cancers** ⁽³⁷⁾: PET/CT is indicated for ampullary adenocarcinoma, biliary tract cancers, and hepatocellular carcinoma to clarify inconclusive conventional imaging and evaluate for metastatic disease.
- **Lung Cancers** ^(38–40): PET/CT is used for non-small cell lung cancer and small cell lung cancer to determine the extent of disease and monitor response to treatment.
- **Neuroendocrine & Adrenal Tumors** ⁽⁴¹⁾: PET/CT is indicated for adrenocortical carcinoma, paraganglioma, pheochromocytoma, well-differentiated neuroendocrine tumors, and poorly differentiated neuroendocrine tumors to determine the extent of disease and monitor response to treatment.
- **Non-Malignant Disease** ⁽⁴³⁾: PET/CT is used for dementia, sarcoidosis, and vasculitis in specific circumstances where conventional imaging is insufficient.
- **Other Malignancies** ^(50–52): PET/CT is indicated for histiocytic neoplasms, uveal melanoma, Merkel cell carcinoma, peritoneal mesothelioma, pleural mesothelioma, neuroblastoma, occult primary tumors, thymomas, thymic carcinomas, thyroid carcinoma, Wilms tumor, and pancreatic cancer to determine the extent of disease and monitor response to treatment.

These guidelines are based on evidence from medical literature, societal guidelines, and state/national recommendations.

ANALYSIS OF EVIDENCE

Analysis:

Per NCCN, "Prior to the annual update of the Guidelines, the NCCN Guidelines Team performs a search of the **PubMed database** using appropriate search terms to obtain key literature published since the previous Guidelines update. The PubMed database is used as it remains the most widely used resource for medical literature and indexes peer-reviewed biomedical literature. Articles from additional sources (e.g., e-publications ahead of print, meeting abstracts) deemed as relevant to the Guidelines may also be included in the literature review process. Panels are provided with a resulting list of key articles relevant to the Guidelines in advance of Panel meetings to add a rigorous evidence-based review to the NCCN Guidelines development and update process." For further details on the guideline development and update process, see NCCN.org.

POLICY HISTORY

Date	Summary
July 2025	- Added a Summary of Evidence and analysis of Evidence - Guideline name was adjusted from PET Scan to; Positron Emission Tomography (PET) Scan, PET Scan with Computed Tomography (CT) for Attenuation
June 2025	- This guideline replaces Evolent Clinical Guideline 070-1 for PET Scan - Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices - Surveillance PET section added to all disease types - Recurrence PET section added to all disease types - Pre-surgical evaluation section added to all disease types - Following Cancers to be consistent with updated version of NCCN - B-cell lymphomas: condensed disease types - Bladder cancer: added indications for MIBC - Breast cancer: clarified imaging recommendations by stage - Gastric cancer: added imaging recommendations for patients with localized disease - Melanoma: clarified imaging recommendations by stage - Neuroendocrine: clarified imaging indications based on completely resected vs unresected disease - Non-malignant disease: added infection section - Non-small cell lung cancer: added clarification for restaging indications - Ovarian cancer: added indications for PET - Penile cancer: clarified indications for initial staging imaging based on clinical features of disease - Prostate cancer: Removed tracers other than PSMA - Testicular cancer: clarified indications for non-seminomatous germ cell tumors

Date	Summary
	● Uterine neoplasms: added indications for high-grade carcinomas ● Applicable Line of Business adjusted – Medicare checked
August 2024	● Reorganized: ○ Grouped similar cancer types together (e.g. leukemias and lymphomas, gynecological cancers) ● Revised indeterminate imaging and contraindications to conventional imaging sections ● Addition of the use of Amyloid PET for early Alzheimer's ● Updated: ○ Surveillance PET section added to disease type where appropriate ○ Combination imaging added to disease type where appropriate ○ Following Cancers to be consistent with updated version of NCCN ■ Adrenal: added indications in limited circumstances ■ Ampullary adenocarcinoma: added section ■ Anal carcinoma: added indications for radiation planning ■ Bone tumors: added combination imaging recommendations, removed age restrictions on PET ■ Cervical cancer: added neuroendocrine small cell carcinoma of the cervix, added surveillance indication ■ Gastrointestinal stromal tumor: added indication for 2-4 weeks after initiation of TKI (tyrosine kinase inhibitor) therapy ■ Gestational trophoblastic neoplasia: added indication for potentially surgically curable metastatic disease ■ Lymphoma: added clarification by sub-type of lymphoma, added indications for combination imaging in pediatric patients, added surveillance indications ■ Melanoma: added indication for patients considering or receiving systemic treatment with immunotherapy ■ Neuroblastoma: added surveillance indications ■ Neuroendocrine: added detail regarding what is needed

Date	Summary
	for restaging in SSTR section ■ Non-malignant disease: added dementia section, ■ Non-small cell lung cancer: added qualifiers to restaging indications (Indicated for any of the following: pre-surgical evaluation, suspected or confirmed progression/recurrence, indeterminate findings on conventional imaging, end of treatment evaluation) ■ Penile cancer: added indication for suspected inguinal lymph node positive disease (based on imaging or exam) ■ Pheochromocytoma/Paraganglioma: separated from general neuroendocrine tumors, added clarification to indications for FDG tracer vs. SSTR tracer ■ Prostate cancer: Reorganized section to include all tracers, updated restaging indications ■ Rectal cancer: separated from colon cancer ■ Small cell lung cancer: clarified initial staging indication to indicated if needed to clarify extent of disease ■ Soft tissue sarcomas: added specific indications for sub-categories of soft tissue sarcoma (angiosarcoma, clear cell sarcoma, epithelioid sarcoma, malignant peripheral nerve sheath sarcoma (MPNST), myxoid/round cell liposarcoma), added combination imaging recommendations, removed age restrictions on PET ■ Systemic light chain amyloidosis: added section ■ Testicular cancer: added initial staging indication for all histologies for prior indeterminate imaging when retroperitoneal dissection is under consideration and extent of disease needs clarification ■ Vulvar cancer: added indications for when sentinel lymph node biopsy is positive and when metastases are suspected

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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Evolent Clinical Guideline 7328 for Stress Echocardiogram

Guideline Number: Evolent_CG_7328	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

This guideline is for stress imaging, specifically Stress Echocardiography (SE) with appropriate preference for suitable alternatives, such as an exercise treadmill exam without imaging, when more suitable, unless otherwise stated (refer to **Background section**).

Special Note

See Legislative Language for specific mandates in **Washington**.

When a noncardiac explanation is provided for symptoms, no testing is required (**AUC Score 8**)⁽¹⁾

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care.⁽²⁻⁶⁾

INDICATIONS FOR STRESS ECHOCARDIOGRAPHY (1,7–10)

Suspected Coronary Artery Disease (CAD)

- **Symptomatic patients without known CAD. No imaging stress test within the last 12 months.** The terms 'typical', 'atypical', and 'non-anginal symptoms' can still be observed in medical records (consult the **Diamond Forrester table** in the **Definitions** section). However, the American College of Cardiology (ACC) has simplified its terminology to 'Less likely anginal symptoms' and 'Likely anginal symptoms' (refer to **Definitions**) and utilized below.
 - Less-likely anginal symptoms
 - When baseline EKG makes standard exercise test inaccurate (see **Definitions** section) **(AUC Score 8)** ⁽¹⁾
 - Likely Anginal Symptoms (typical angina)
 - < 50 years old with ≤ one risk factor if an electrocardiogram (ECG) treadmill test cannot be done. **AUC scores for this bullet point are identical for myocardial perfusion imaging (MPI), stress echo, and exercise tolerance test (ETT) **(AUC Score 7)**. ⁽¹⁾ Although the ACC guideline does not specify youth and gender, decisions should be guided by best medical judgment, considering factors such as safety and radiation exposure.
 - ≥ 50 years old **(AUC Score 8)** ⁽¹⁾
 - Repeat testing in patient with new or worsening symptoms and negative result at least one year ago **AND** meets one of the criteria above
- **Asymptomatic patients without known CAD**
 - Previously unevaluated ECG evidence of possible myocardial ischemia including ischemic ST segment or T wave abnormalities (see **Background** section)
 - Previously unevaluated pathologic Q waves (see **Background** section)
 - Previously unevaluated complete left bundle branch block

Abnormal Calcium Scores (11,12)

- STABLE SYMPTOMS with a prior Coronary Calcium Agatston Score of >100. No prior stress imaging done within the last 12 months ^(1,11) **(AUC Score 7)** ⁽¹⁾
- ASYMPTOMATIC high global CAD risk patient with a prior Coronary Calcium Agatston Score of >100. No prior stress imaging done within the last 12 months ^(11,13)
- ASYMPTOMATIC patient with Coronary Calcium Agatston Score > 400 (or a qualitative assessment where 'severe' coronary artery calcification is stated in a report incidentally detected on CT imaging performed for other clinical indications) No prior stress imaging done within the last 12 months ⁽¹⁴⁾

Inconclusive CAD Evaluation and Obstructive CAD Remains a Concern

- Exercise stress ECG with low-risk Duke treadmill score ≥ 5 , but patient's current symptoms indicate an increasing likelihood of disease
- Exercise stress ECG with an intermediate Duke treadmill score **(AUC 8)** ⁽¹⁾
- A previously unevaluated ventricular wall motion abnormality demonstrated by another imaging modality and stress echo is being performed to determine if the patient has myocardial ischemia ^(1,15) **(AUC Score 5)** ⁽¹⁾
- Intermediate coronary computed tomography angiography (CCTA) defined as 40%-70% lesion **(AUC Score 7)** ⁽¹⁾
- Coronary stenosis of unclear significance on previous coronary angiography not previously evaluated

Follow-Up of Patient's Post Coronary Revascularization (PCI or CABG) ⁽¹⁾

- **Asymptomatic follow-up stress imaging** at a minimum of 2 years post coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) (whichever is later) is appropriate for patients with:
 - **High risk:** diabetes with accelerated progression of CAD, chronic kidney disease (CKD), peripheral artery disease (PAD), prior brachytherapy, In-Stent Restenosis (ISR), or saphenous vein graft (SVG) intervention **(AUC Score 7)** ⁽¹⁾
 - A history of silent ischemia **(AUC Score 7)** ⁽¹⁾
 - A history of a prior left main stent **(AUC Score 5)** ⁽¹⁾
- For patients with high occupational risk, associated with public safety, airline and boat pilots, bus and train drivers, bridge and tunnel workers/toll collectors, police officers and firefighters
- **New, recurrent, or worsening symptoms, treated medically or by revascularization** is an indication for stress imaging, if it will alter management for typical anginal symptoms or symptoms documented to be similar to those prior to revascularization if no imaging stress test within the last 12 months. **(AUC Score 8)** ^(1,11)

Follow-Up of Known CAD ⁽¹⁾

- **Routine follow-up of asymptomatic or stable symptoms** when last invasive or non-invasive assessment of coronary disease showed hemodynamically significant CAD (ischemia on stress test or fractional flow reserve (FFR) ≤ 0.80 or significant stenosis in a major vessel ($\geq 50\%$ left main coronary artery or $\geq 70\%$ left anterior descending artery (LAD), left circumflex artery (LCX), right coronary artery (RCA)), over two years ago without intervening coronary revascularization, is an appropriate indication for stress imaging

Special Diagnostic Conditions Requiring Coronary Evaluation

- Prior acute coronary syndrome (with documentation in MD notes), within last 12 months, without a prior stress test or coronary angiography performed since that time
- Newly diagnosed systolic or diastolic heart failure, **with reasonable suspicion of cardiac ischemia (prior events, risk factors)**, unless invasive coronary angiography is immediately planned ⁽¹⁶⁾
- Ventricular arrhythmias ⁽¹⁷⁾
 - Sustained ventricular tachycardia (VT) > 100 bpm **(AUC Score 7)** ⁽¹⁾, ventricular fibrillation (VF) **(AUC Score 7)** ⁽¹⁾, or exercise-induced VT **(AUC Score 8)** ⁽¹⁾, when invasive coronary arteriography has not been performed
 - Non-sustained VT, multiple episodes, each ≥ 3 beats at ≥ 100 bpm, frequent premature ventricular contractions (PVCs) (defined as greater than or equal to 30/hour on remote monitoring), when an exercise ECG cannot be performed **(AUC Score 7)** ⁽¹⁾
- For intermediate and high-risk global patients who require initiation of Class IC antiarrhythmic drugs. It can be performed annually thereafter until discontinuation of drug use ⁽¹⁷⁾ **(AUC Score 7)** ⁽¹⁾
- Hemodynamic assessment of ischemia in one of the following documented conditions:
 - Anomalous coronary arteries in an asymptomatic individual without prior stress echocardiography **(AUC Score 8)** ⁽¹⁸⁾
 - Myocardial bridging of a coronary artery ⁽¹⁹⁾
- Coronary aneurysms in Kawasaki's disease ⁽²⁰⁾
- Following radiation therapy to the anterior or left chest, at 5 years post initiation and every 5 years thereafter ⁽²¹⁾ **(AUC Score 6)** ⁽¹⁾

Valvular

Evaluation with Inclusion of Doppler

- For the evaluation of aortic stenosis and flow (contractile) reserve in symptomatic patients with severe aortic stenosis by calculated valve area, low flow / low gradient, and ejection fraction < 50% ^(2,22)
- For evaluation of asymptomatic moderate or severe aortic stenosis (AS) for measurement of changes in valve hemodynamics ^(2,22) **(AUC Score 8)** ⁽²²⁾
- Non-severe aortic regurgitation (AR) with symptoms: Assessment of functional capacity and to assess for other causes of symptoms ^(2,22) **(AUC Score 7)** ⁽²²⁾
- For evaluation of mitral stenosis (MS) if there is ^(2,22):
 - Exertional shortness of breath which suggests the amount of MS is worse than is seen on the resting echocardiogram **(AUC Score 8)** ⁽²²⁾

- For evaluation for mitral regurgitation (MR) if there is one of the following ^(2,22,23):
 - Exertional shortness of breath which suggests the amount of MR is worse than is seen on the resting echocardiogram **(AUC Score 8)** ⁽²²⁾
 - The echocardiogram is not able to distinguish whether the MR is moderate or severe in a patient that is asymptomatic **(AUC Score 7)** ⁽²²⁾
- For symptomatic patients with hypertrophic cardiomyopathy (HCM), who do not have resting or provokable outflow tract gradient ≥ 50 mmHg on transthoracic echocardiogram (TTE), for detection and quantification of dynamic left ventricular outflow tract (LVOT) obstruction ⁽²⁴⁾
- For asymptomatic patients with HCM who do not have a resting or provokable outflow tract gradient ≥ 50 mmHg on TTE ⁽²⁴⁾

Diastolic Function

- For unexplained dyspnea and suspected heart failure with preserved left ventricular ejection fraction (LVEF) heart failure with preserved ejection fraction (HFpEF) with normal or equivocal diastolic function on resting images **(AUC Score 8)** ⁽¹⁾

Prior To Elective Non-Cardiac Surgery

- An intermediate or high-risk surgery with of one or more risk factors (see below), **AND** documentation of an inability to walk (or < 4 METs) **AND** there has not been an imaging stress test within 1 year ^(25–27) **(AUC Score 6)** ⁽²⁸⁾
 - **Risk factors:** history of ischemic heart disease, history of congestive heart failure, history of cerebrovascular disease, preoperative treatment with insulin, and preoperative serum creatinine >2.0 mg/dL.
 - **Surgical Risks:**
 - **High risk surgery:** Aortic and other major vascular surgery, peripheral vascular surgery, anticipated prolonged surgical procedures associated with large fluid shifts and/or blood loss
 - **Intermediate risk surgery:** Carotid endarterectomy, head and neck surgery, intraperitoneal and intrathoracic surgery, orthopedic surgery, prostate surgery
 - **Low risk surgery:** Endoscopic procedures, superficial procedure, cataract surgery, breast surgery

Pre Organ-Transplant

- Planning for any organ or stem cell transplantation is an indication for preoperative stress imaging, if there has not been a conclusive stress evaluation, CTA, or heart catheterization within the past year, at the discretion of the transplant service **(AUC Score 6)** ⁽²⁸⁾

Post Cardiac Transplantation

- Annually, post cardiac transplantation, in a patient not undergoing invasive coronary arteriography

LEGISLATIVE LANGUAGE

Washington

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease ⁽²⁹⁾

Number and coverage topic:

20211105A – Noninvasive Cardiac Imaging for Coronary Artery Disease

HTCC coverage determination:

Noninvasive cardiac imaging is a **covered benefit with conditions**.

HTCC reimbursement determination:

Limitations of coverage: The following noninvasive cardiac imaging technologies are **covered with conditions**:

- Stress echocardiography for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of Coronary Artery Disease (CAD), or
 - Adult patients with known CAD who have new or worsening symptoms.
- Single Positron Emission Tomography (SPECT) for:
 - Patients under the same conditions as stress echocardiography when stress echocardiography is not technically feasible or clinically appropriate.
- Positron Emission Tomography (PET) for:
 - Patients under the same conditions as SPECT, when SPECT is not technically feasible or clinically appropriate.
- Coronary Computed Tomographic Angiography (CCTA) for:
 - Symptomatic adult patients (≥ 18 years of age) at intermediate or high risk of CAD, or
 - Adult patients with known CAD who have new or worsening symptoms.
- CCTA with Fractional Flow Reserve (FFR) for:
 - Patients under the same conditions as CCTA, when further investigation of functional significance of stenoses is clinically indicated.

Non-covered indicators:

N/A

Notes:

- Out of scope/data not reviewed for this decision:
 - Asymptomatic individuals, follow up of prior abnormal cardiac imaging studies, myocardial viability, preoperative evaluation
 - Patients presenting for evaluation of cardiac pathologies other than CAD
- This determination supersedes the following previous determinations:
 - Coronary Computed Tomographic Angiography for detection of Coronary Artery Disease (20081114A)
 - Cardiac Nuclear Imaging (20130920A)

CODING AND STANDARDS

Codes

+93320, +93321, +93325, 93350, 93351, +93352, +93356

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Stress echocardiography is an exercise stress test which utilizes echocardiography to provide information on exercise tolerance, ischemic burden, and structural heart disease including valvular disease and provides analysis of left ventricular function.

Stress echocardiography (SE) refers to ultrasound imaging of the heart during exercise electrocardiography (ECG) testing, during which visualized wall motion abnormalities can provide evidence of potential significant coronary artery disease (CAD).

While drug-induced stress with dobutamine can be an alternative to exercise stress testing in patients who are unable to exercise, this guideline does not require use of this modality. Hence, reference in this document to SE predominantly refers to exercise stress echocardiography.

Although SE provides comparable accuracy without radiation risk, relative to myocardial perfusion imaging (MPI), scenarios which do not permit effective use of SE might be better suited for stress imaging with MPI, cardiovascular magnetic resonance imaging (CMR) or positron emission tomography (PET), or coronary computed tomography angiography (CCTA).

Cardiac Doppler ultrasound is a form of ultrasound that can detect and measure blood flow. Doppler ultrasound depends on the Doppler Effect, a change in the frequency of a wave resulting from the motion of a reflector, the red blood cell. There are three types of Doppler ultrasound performed during a cardiac Doppler examination:

- Pulsed Doppler
- Continuous wave Doppler
- Color flow Doppler

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁴⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Definitions

- Stable patients without known CAD fall into 2 categories ^(1,7,8):
 - **Asymptomatic patients**, for whom Global Risk of CAD events can be determined from coronary risk factors using calculators available online (see **Websites for Global Cardiovascular Risk Calculators** section)
 - **Symptomatic patients**, for whom we estimate the Pretest Probability that their chest-related symptoms are due to clinically significant CAD (see below):
- The medical record should provide enough detail to establish the type of chest pain:
 - **Likely Anginal symptoms** encompass chest/epigastric/shoulder/arm/jaw pain, chest pressure/discomfort occurring with exertion or emotional stress and relieved by rest, nitroglycerine or both.
 - **Less-Likely Anginal symptoms** include dyspnea, or fatigue not relieved by rest/nitroglycerin, as well as generalized fatigue or chest discomfort with a time course not indicative of angina (e.g., resolving spontaneously within seconds or lasting for an extended period unrelated to exertion).
- **Risk Factors for Coronary disease include (but not limited to)**: diabetes mellitus, smoking, family history of premature CAD (men age less than 55, females less than 65), hypertension, dyslipidemia.
- Beginning 2023, the classification terms for angina were updated within the ACC's

Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease to **Less Likely Anginal Symptoms** and **Likely Anginal Symptoms** as in #2. Previously, the document referred to 'Typical Angina', 'Atypical Angina' and 'Non-Anginal' symptoms, defined by the **Diamond Forrester Table**. We still provide this information for your reference ^(1,7,8):

Diamond Forrester Table ^(30,31)

Age (Years)	Gender	Typical/Definite Angina Pectoris	Atypical/Probable Angina Pectoris	Nonanginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40 – 49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50 – 59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very low: < 5% pretest probability of CAD, usually not requiring stress evaluation

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- MPI may be performed without diversion to SE in any of the following ^(1,32):
 - Inability to exercise
 - Physical limitations precluding ability to exercise for at least 3 full minutes of Bruce protocol
 - Limited functional capacity (< 4 metabolic equivalents) **such as one** of the following:
 - Cannot take care of their activities of daily living (ADLs) or ambulate
 - Cannot walk 2 blocks on level ground
 - Cannot climb 1 flight of stairs
 - Cannot vacuum, dust, do dishes, sweep, or carry a small grocery bag
 - Other Comorbidities

- Severe chronic obstructive pulmonary disease with pulmonary function test (PFT) documentation, severe shortness of breath on minimal exertion, or requirement of home oxygen during the day
- Poorly controlled hypertension, with systolic BP > 180 or Diastolic BP > 120 (and clinical urgency not to delay MPI)
- ECG and Echo-Related Baseline Findings
 - Prior cardiac surgery (coronary artery bypass graft or valvular)
 - Documented poor acoustic imaging window
 - Left ventricular ejection fraction $\leq 40\%$
 - Pacemaker or ICD
 - Persistent atrial fibrillation
 - Resting wall motion abnormalities that would make SE interpretation difficult
 - Complete left bundle branch block (LBBB)
- Risk-related scenarios
 - High pretest probability in suspected CAD
 - Intermediate or high global risk in patients requiring type IC antiarrhythmic drugs (prior to initiation of therapy and annually)
 - Arrhythmia risk with exercise
- Previously unevaluated pathologic Q waves (in two contiguous leads) defined as the following:
 - 40 ms (1 mm) wide
 - 2 mm deep
 - 25% of depth of QRS complex
- ECG Stress Test Alone versus Stress Testing with Imaging

Prominent scenarios suitable for an ECG stress test **WITHOUT** imaging (i.e., exercise treadmill ECG test) are inferred from the guidelines presented above, often requiring that the patient can exercise for at least 3 minutes of Bruce protocol with achievement of near maximal heart rate **AND** has an interpretable ECG for ischemia during exercise ⁽¹⁾:

 - The (symptomatic) low or intermediate pretest probability patient who can exercise and has an interpretable ECG
 - The patient who is under evaluation for exercise-induced arrhythmia
 - For the evaluation of syncope or presyncope during exertion
 - The patient who requires an entrance stress test ECG for a cardiac rehab program or for an exercise prescription
 - When exercise cannot be performed, pharmacologic stress can be considered.
- Duke Exercise ECG Treadmill Score ⁽³³⁾

Calculates risk from ECG treadmill alone:

- The equation for calculating the Duke treadmill score (DTS) is: $DTS = \text{exercise time in minutes} - (5 \times \text{ST deviation in mm or } 0.1 \text{ mV increments}) - (4 \times \text{exercise angina score})$, with angina score being 0 = none, 1 = non-limiting, and 2 = exercise-limiting.
- The score typically ranges from - 25 to + 15. These values correspond to low-risk (with a score of $\geq + 5$), intermediate risk (with scores ranging from - 10 to + 4), and high-risk (with a score of ≤ -11) categories.
- An uninterpretable baseline ECG includes ⁽⁷⁾:
 - ST segment depression is considered significant when there is 1 mm or more, not for non-specific ST- T wave changes
 - Ischemic looking T waves are considered significant when there are at least 2.5 mm inversions (excluding V1 and V2)
 - LVH with associated STT abnormalities, pre-excitation pattern such as WPW, a ventricular paced rhythm, or left bundle branch block
 - Digitalis use
 - Resting HR under 50 bpm on a medication, such as beta-blockers or calcium channel blockers, that is required for patient's treatment and cannot be stopped, with an anticipated suboptimal workload
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years. High global risk by itself generally lacks scientific support as an indication for stress imaging. There are rare exemptions, such as patients requiring IC antiarrhythmic drugs, who might require coronary risk stratification prior to initiation of the drug.
 - **CAD Risk—Low**
10-year absolute coronary or cardiovascular risk less than 10%.
 - **CAD Risk—Moderate**
10-year absolute coronary or cardiovascular risk between 10% and 20%.
 - **CAD Risk—High**
10-year absolute coronary or cardiovascular risk of greater than 20%.

Websites for Global Cardiovascular Risk Calculators* (34–38)

Risk Calculator	Link to Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

*Patients who have known CAD are already at high global risk and are not applicable to the calculators.

- **Definitions of Coronary Artery Disease** (7,8,12,39,40)

Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).

- Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. Its incorporation into Global Risk can be achieved by using the MESA risk calculator.
- Ischemia-producing disease (also called hemodynamically or functionally significant disease, for which revascularization might be appropriate), generally implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69% ⁽¹⁾
 - For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum lumen cross-sectional area on IVUS ≤ 6 square mm ^(7,40,41)

- FFR (fractional flow reserve) ≤ 0.80 for a major vessel ^(40,41)
- FFR (fractional flow reserve) is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow
- Anginal Equivalent ^(7,42,43)
 - Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons to suspect that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia). This may include respiratory rate, oximetry, lung exam, etc. (as well as d-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Syncope per se is not an anginal equivalent.

Acronyms/Abbreviations

ACC: American College of Cardiology

ADLs: Activities of daily living

CABG: Coronary artery bypass grafting surgery

CAD: Coronary artery disease

CCTA: Coronary computed tomography angiography

CKD: Chronic kidney disease

CMR: Cardiovascular magnetic resonance imaging

CT(A): Computed tomography (angiography)

DTS: Duke Treadmill Score

ECG: Electrocardiogram

ETT: Exercise tolerance test

FFR: Fractional flow reserve

HCM: Hypertrophic cardiomyopathy

ISR: : In-Stent Restenosis

IVUS: Intravascular ultrasound

LAD: Left anterior descending artery

LBBB: Left bundle-branch block

LCX: left circumflex artery

LVEF: Left ventricular ejection fraction

LVH: Left ventricular hypertrophy

LVOT: Left ventricular outflow tract

MESA: Multi-Ethnic Study of Atherosclerosis
MET: Estimated metabolic equivalent of exercise
MI: Myocardial infarction
MPI: Myocardial perfusion imaging
MR: Mitral regurgitation
MS: Mitral stenosis
PAD: peripheral artery disease
PCI: Percutaneous coronary intervention
PET: Positron emission tomography
PFT: Pulmonary function test
PVCs: Premature ventricular contractions
RCA: Right coronary artery
SE: Stress echocardiography
SPECT: Single-photon emission computed tomography
SVG: Saphenous vein graph
TTE: Transthoracic echocardiography
VT: Ventricular tachycardia
VF: Ventricular fibrillation
WPW: Wolff-Parkinson-White

SUMMARY OF EVIDENCE

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease ⁽¹⁾

Study Design: This document is an appropriate use criterion (AUC) for the detection and risk assessment of chronic coronary disease. It was developed by the American College of Cardiology Solution Set Oversight Committee and other specialty societies.

Target Population: Patients with known or suspected chronic coronary disease, including those with symptoms of ischemia, those without symptoms but at risk for atherosclerotic cardiovascular disease, and those with other cardiovascular conditions.

Key Factors: The AUC provides ratings for various diagnostic and prognostic tests, including stress testing, imaging, and invasive procedures. It aims to guide clinicians in selecting appropriate tests based on clinical scenarios, considering factors such as patient symptoms, prior testing, and risk factors. The document also includes a "no test" option for certain scenarios, emphasizing the importance of clinical judgment and patient preferences.

2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease ⁽⁷⁾

Study Design: This document is a practice guideline for the diagnosis and management of patients with stable ischemic heart disease. It was developed by the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, along with other associations.

Target Population: Adult patients with stable known or suspected ischemic heart disease, including those with new-onset chest pain or stable pain syndromes.

Key Factors: The guideline covers various aspects such as clinical evaluation, risk assessment, treatment recommendations, and patient follow-up. It emphasizes the importance of patient involvement in decision-making and provides detailed recommendations for diagnosis, risk assessment, and treatment, including lifestyle modifications and medical therapy.

2023 AHA/ACC/ACCP/ASPC/NLA/PCNA Guideline for the Management of Patients With Chronic Coronary Disease ⁽⁹⁾

Study Design: This guideline provides an update on the management of patients with chronic coronary disease, consolidating new evidence since the previous guidelines. It was developed by the American Heart Association/American College of Cardiology Joint Committee on Clinical Practice Guidelines.

Target Population: Patients with chronic coronary disease, including those with stable ischemic heart disease and those who have had a myocardial infarction or revascularization.

Key Factors: The guideline emphasizes a patient-centered approach, considering social determinants of health and incorporating shared decision-making and team-based care. It includes recommendations for lifestyle changes, medical therapy, revascularization, and management of special populations.

ANALYSIS OF EVIDENCE

Analysis ^(1,7,9):

Stress echocardiography is consistently recognized as a valuable tool for diagnosing and managing patients with CAD and SIHD. The shared conclusions across the three articles highlight its diagnostic accuracy, non-invasive nature, and role in risk stratification. However, the articles differ in their focus on methodology, clinical scenarios, and technological advancements. The 2012 guidelines provide a foundational review of evidence, while the 2023 updates incorporate new studies and advancements in imaging technologies. The appropriate use criteria in the Winchester 2023 article offer practical guidance for clinicians in selecting the right test based on patient characteristics and clinical presentation.

Shared Conclusions:

- All three articles emphasize the diagnostic value of stress echocardiography in detecting myocardial ischemia and assessing cardiac function. Stress echocardiography is highlighted as a reliable method for evaluating patients with suspected coronary artery disease (CAD) and stable ischemic heart disease (SIHD).

- Stress echocardiography is consistently recommended for risk stratification in patients with known or suspected CAD. It helps in identifying patients at higher risk for adverse cardiovascular events, guiding therapeutic decision-making.
- The non-invasive nature of stress echocardiography is praised across all articles. It is considered a safer alternative to invasive procedures like coronary angiography, especially for initial diagnostic purposes

POLICY HISTORY

Date	Summary
July 2025	• This guideline merges and replaces two Evolent guidelines with identical clinical criteria: ECG 7328-01 for Stress Echocardiography and ECG 026 for Stress Echocardiography into Evolent Clinical Guideline 7328 for Stress Echocardiogram • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Updated AUC scores • Applicable Line of Business adjusted – Medicare checked • Added a Summary of Evidence and Analysis of Evidence

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Clinical Services Guideline Review Committee

Disclaimer

Evolent Clinical Guidelines do not constitute medical advice. Treating health care professionals are solely responsible for diagnosis, treatment, and medical advice. Evolent uses Clinical Guidelines in accordance with its contractual obligations to provide utilization management. Coverage for services varies for individual members according to the terms of their health care coverage or government program. Individual members' health care coverage may not utilize some Evolent Clinical Guidelines. Evolent clinical guidelines contain guidance that requires prior authorization and service limitations. A list of procedure codes, services or drugs may not be all inclusive and does not imply that a service or drug is a covered or non-covered service or drug. Evolent reserves the right to review and update this Clinical Guideline in its sole discretion. Notice of any changes shall be provided as required by applicable provider



agreements and laws or regulations. Members should contact their Plan customer service representative for specific coverage information.

Evolent Clinical Guidelines are comprehensive and inclusive of various procedural applications for each service type. Our guidelines may be used to supplement Medicare criteria when such criteria is not fully established. When Medicare criteria is determined to not be fully established, we only reference the relevant portion of the corresponding Evolent Clinical Guideline that is applicable to the specific service or item requested in order to determine medical necessity.

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Evolut Clinical Guideline 7295 for Heart Catheterization

Guideline Number: Evolent_CG_7295	<u>Applicable Codes</u>	
<i>"Evolent" refers to Evolent Health LLC and Evolent Specialty Services, Inc.</i> <i>© 2026 Evolent. All rights Reserved.</i>		
Original Date: January 2026	Last Revised Date: July 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Purpose

Heart catheterization is an invasive angiographic procedure used to evaluate the presence and extent of coronary artery disease (CAD).

In addition to angiography, it can also include ventriculography, aortography, acquisition of hemodynamic data, measurement of cardiac output, detection and quantification of shunts and flows, intravascular ultrasound (IVUS), and fractional flow reserve (FFR)/instantaneous wave free ratio (iFR) for determination of a lesion's hemodynamic severity. CAD stenosis $\geq 70\%$ ($\geq 50\%$ in the left main coronary artery) is considered clinically significant or obstructive CAD. ^(1–4)

Clinical Reasoning

All criteria are substantiated by the latest evidence-based medical literature. To enhance transparency and reference, Appropriate Use (AUC) scores, when available, are diligently listed alongside the criteria.

This guideline first defaults to AUC scores established by published, evidence-based guidance endorsed by professional medical organizations. In the absence of those scores, we adhere to a standardized practice of assigning an AUC score of 6. This score is determined by considering variables that ensure the delivery of patient-centered care in line with current guidelines, with a focus on achieving benefits that outweigh associated risks. This approach aims to maintain a robust foundation for decision-making and underscores our commitment to upholding the highest standards of care. ^(5–9)

INDICATIONS FOR INVASIVE CORONARY ARTERIOGRAPHY (1,10–13)

General

- Typical angina with new onset or evolving ischemic electrocardiogram (ECG) changes
- Prinzmetal's or variant angina (pain experienced at rest with ST elevation) on guideline-directed medical therapy (GDMT)
- New onset or worsening of the patient's previously known anginal symptoms in a patient with a history of coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) (**AUC Score 7**)⁽³⁾
- Symptomatic patients with a high pretest probability (**AUC Score 7**)⁽³⁾
- Patient with CAD and symptoms of angina with intermediate or high-risk findings on non-invasive imaging stress test including stress induced left ventricular (LV) dysfunction.

Stable Ischemic Heart Disease

- Exercise ECG stress test with high-risk findings, such as Duke Score ≤ -11 , ST-segment elevation, exercise-induced hypotension, ventricular tachycardia (VT), or prolonged ST-segment depression (> 1 mm) in multiple ECG leads⁽¹¹⁾
- Ischemia at low threshold on stress-testing with or without an abnormal decrease in normal systolic blood pressure response during exercise
- Stress imaging with moderate to severe ischemia (**AUC Score 9**)⁽³⁾ (see **Definitions**)
- Non-invasive test with low-risk findings with new, worsening, or limiting symptoms with reasonable suspicion of cardiac origin despite optimal medical therapy (OMT) or inability to tolerate guideline-directed medical therapy (GDMT)^(1,10,11)
- New, worsening, or limiting symptoms, with known unrevascularized obstructive CAD, in a patient eligible for revascularization^(1,10)
- Post STEMI with "culprit only" revascularization and plan for further PCI of non-culprit lesion⁽¹⁴⁾
- Before high-risk non-cardiac surgery in patients who have evidence of ischemia by non-invasive testing.
- Discordant, equivocal, or inconclusive non-invasive evaluation in patients with suspected symptomatic stable ischemic heart disease, including the following^(3,11):
 - Low risk stress imaging with high-risk stress ECG response or stress induced typical angina
 - Equivocal, uninterpretable, or inconclusive stress imaging due to issues of attenuation or other problems with interpretability

Coronary CTA (CCTA) Abnormalities

- Symptomatic patient with one of the following ^(1,11,13)
 - One vessel with $\geq 50\%$ stenosis (**AUC Score 7**) ⁽³⁾
 - A stenosis of 40-90% and FFR-CT ≤ 0.8 ⁽¹⁵⁾
 - $\geq 50\%$ left main stenosis, even if asymptomatic

Heart Failure with Left Ventricular Dysfunction

- New heart failure, cardiomyopathy, or wall motion abnormality in patients who are candidates for coronary revascularization, including one of the following ^(1,11,16) (**AUC Score 8**) ⁽³⁾:
 - Newly recognized heart failure in patients with known or suspected CAD
 - Symptomatic heart failure or ischemia with new, unexplained wall motion abnormality ^(1,11)
 - Structural abnormality (severe mitral regurgitation or ventricular septal defect) with reason to suspect ischemic origin
 - Deterioration in clinical status of heart failure or cardiomyopathy requiring invasive evaluation for guidance or alteration in therapy
 - Clarification of the diagnosis of myocarditis versus acute coronary syndrome ⁽¹⁷⁾

Ventricular Arrhythmias

- Ventricular arrhythmias, without identified non-cardiac cause:
 - Following recovery from unexplained sudden cardiac arrest ⁽¹⁸⁾
 - Sustained ventricular tachycardia (VT) (**AUC Score 7**) ⁽³⁾
 - Exercise-induced VT (**AUC Score 7**) ⁽³⁾
 - Ventricular fibrillation (VF) (**AUC score 8**) ⁽³⁾

Prior to Non-Coronary Intervention and Cardiac Surgery

- Evaluation of coronary anatomy, with consideration of coronary revascularization, prior to cardiac surgery in patients with any of the following ⁽¹⁹⁻²²⁾:
 - Symptoms of angina
 - Stress imaging with evidence of ischemia
 - Decreased LV systolic function (ejection fraction (EF) $< 50\%$)
 - History of CAD
 - Coronary risk factors, including men > 40 and postmenopausal women ⁽²²⁾
 - Non-invasive data that is inconclusive

- Severe valve disease
- Requirement for detailed assessment of coronary artery anatomy prior to aortic valve homograft surgery, pulmonary autograft (Ross procedure), or aortic root procedure
- Patients undergoing transcatheter aortic valve replacement (TAVR) or other transcatheter valve procedures
- Can be done pre-organ transplant when required by transplant center protocol in place of, but not in addition to an imaging study

Hypertrophic Cardiomyopathy (HCM)

- Patients with HCM, who are candidates for septal reduction therapy (SRT), and for whom there is uncertainty of left ventricular outflow tract (LVOT) obstruction on noninvasive imaging studies, invasive hemodynamic assessment with cardiac catheterization is recommended ⁽²³⁾
- In patients with symptoms or evidence of myocardial ischemia (CCTA also allowed)
- Prior to surgical myectomy in HCM patients who are at risk for coronary atherosclerosis (CCTA also allowed)

Post Cardiac Transplantation

- Assessment for allograft vasculopathy annually ⁽²⁴⁾

Hemodynamic Assessment

- Indications for angiographic and/or hemodynamic assessment of valvular function or shunt physiology ^(11,19,25)
 - Assessment of bioprosthetic valve when transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) were inadequate, and cardiac magnetic resonance (CMR) or cardiac computed tomography (CCT) are not available
 - Assessment of mechanical valve prostheses when TTE and TEE are inadequate and CCTA is not available
 - Discordance between non-invasive data and clinical impression of severity of valvular disease
 - Evaluation of indeterminate shunt anatomy or shunt flows/ratio
- Indications for hemodynamic assessment only ^(11,25)
 - Assessment of constrictive and restrictive physiology
 - Assessment of pulmonary hypertension when non-invasive data provides inadequate information for management, or to evaluate response to intravenous drug therapy
 - Assessment of hemodynamics in heart failure, cardiomyopathy, or adult congenital heart disease, when
 - Non-invasive data is discordant or conflicts with the clinical presentation

- Non-invasive data is inadequate for clinical management

INDICATIONS FOR ASCENDING AORTOGRAPHY (19,21,22)

- Evaluation of aortic root dilatation in patients with severe aortic stenosis and regurgitation prior to valve surgery
- Evaluation of aortic root, ascending aortic aneurysm prior to repair
- Evaluation central shunts, coarctation and great vessels
- Bypass graft identification at the time of left heart catheterization
- Disease affecting the aorta and coronary arteritis in which coronary artery involvement is suspected.

CODING AND STANDARDS

Codes

93452, 93453, 93454, 93455, 93456, 93457, 93458, 93459, 93460, 93461, +93462, +93463, +93464, 93531, 93532, 93533, 93563, 93564, +93565, +93566, +93567, +93568, 93573, 93574, 93595, 93596, 93597, 93598

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

Heart catheterization is the passage of a thin flexible tube (catheter) into the left or right heart systems via arteries or veins, respectively, for the purposes of hemodynamic measurements, acquisition of blood samples from specific locations, and/or the injection of radiopaque medium for the purposes of visualizing vascular anatomy. Coronary angiography is the passage of a catheter into the left side of the heart to diagnose or treat blockages of coronary arteries.

Definitions

- Stable Patients without Known CAD fall into 2 categories ^(1,3,4):
 - **Asymptomatic**, for whom global risk of CAD events can be determined from coronary risk factors, using calculators available online (see Global Cardiovascular Risk Calculators section)
 - **Symptomatic**, for whom the pretest probability that chest-related symptoms are due to clinically significant CAD is estimated
- The medical record should provide enough detail to the types of chest pain ⁽³⁾:
 - Likely Anginal symptoms encompass chest/epigastric/shoulder/arm/jaw pain, chest pressure/discomfort occurring with exertion or emotional stress and relieved by rest, nitroglycerine or both
 - Less-Likely Anginal symptoms include dyspnea, or fatigue not relieved by rest/nitroglycerin, as well as generalized fatigue or chest discomfort with a time course not indicative of angina (e.g., resolving spontaneously within seconds or lasting for an extended period unrelated to exertion)
- Risk Factors for Coronary disease include (but not limited to): diabetes mellitus, smoking, family history of premature CAD (men age less than 55, females less than 65), hypertension, dyslipidemia
- Beginning 2023, the classification terms for angina were updated within the ACC's Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease to Less Likely Anginal Symptoms and Likely Anginal Symptoms. Previously, the document referred to "Typical Angina", "Atypical Angina" and "Non-Anginal" symptoms, defined by the Diamond Forrester Table. We still provide this information for your reference

Diamond Forrester Table ^(3,26)

Age (Years)	Gender	Typical/ Definite Angina Pectoris	Atypical/ Probable Angina Pectoris	Non-anginal Chest Pain
≤ 39	Men	Intermediate	Intermediate	Low
	Women	Intermediate	Very low	Very low
40 – 49	Men	High	Intermediate	Intermediate
	Women	Intermediate	Low	Very low
50 – 59	Men	High	Intermediate	Intermediate
	Women	Intermediate	Intermediate	Low

Age (Years)	Gender	Typical/ Definite Angina Pectoris	Atypical/ Probable Angina Pectoris	Non-anginal Chest Pain
≥ 60	Men	High	Intermediate	Intermediate
	Women	High	Intermediate	Intermediate

Very Low: < 5% pretest probability of CAD, usually not requiring stress evaluation

Low: 5 - 10% pretest probability of CAD

Intermediate: 10% - 90% pretest probability of CAD

High: > 90% pretest probability of CAD

- Coronary Risk Categories Derived from Non-invasive Testing ^(1,3,13)
 - **High risk (> 3% annual death or MI)**
 - Severe resting left ventricular (LV) dysfunction (LVEF < 35%) not readily explained by non-coronary causes
 - Resting perfusion abnormalities ≥ 10% of the myocardium in patients without prior history or evidence of myocardial infarction (MI)
 - Stress ECG findings including ≥ 2 mm of ST-segment depression at low workload or persisting into recovery, exercise-induced ST-segment elevation, or exercise-induced ventricular tachycardia (VT)/ventricular fibrillation (VF)
 - Severe stress-induced left ventricular (LV) dysfunction (peak exercise EF < 45% or drop in EF with stress ≥ 10%)
 - Moderate to severe ischemia on nuclear stress imaging defined as involving ≥ 10% ischemic myocardium, or stress segmental scores indicating multiple abnormal vascular territories
 - Stress-induced LV dilation. Transient ischemic dilation (TID) is the ratio of left ventricular area immediately post-exercise divided by the area of the 4-hour redistribution image, with an abnormal ratio defined as > 1.12 ⁽²⁷⁾
 - Inducible wall motion abnormality (involving ≥ 2 segments or ≥ 2 vascular territories)
 - Wall motion abnormality developing at low dose of dobutamine (≤ 10 mg/kg/min) or at a low heart rate (< 120 beats/min)
 - Multivessel obstructive CAD (≥ 70% stenosis) or left main stenosis (≥ 50% stenosis) on CCTA
 - **Intermediate risk (1% to 3% annual death or MI)**
 - Mild or moderate resting LV dysfunction (EF 35% to 49%) not readily explained by non-coronary causes
 - Resting perfusion abnormalities in 5% to 9.9% of the myocardium in patients without a history or prior evidence of MI

- ≥ 1 mm of ST-segment depression occurring with exertional symptoms
- Stress-induced perfusion abnormalities involving 5% to 9.9% of the myocardium or stress segmental scores (in multiple segments) indicating 1 vascular territory with abnormalities but without LV dilation
- Inducible wall motion abnormality involving 1 segment or 1 vascular territory
- CAC score 100 to 399 Agatston units (only for use in primary prevention, not for heart catheterization decision making) ^(1,4,11,28)
- One vessel CAD with $\geq 70\%$ stenosis or moderate CAD stenosis (50% to 69% stenosis) in ≥ 2 arteries on CCTA
- **Low risk (< 1% annual death or MI)**
 - Low-risk treadmill score (score ≥ 5) or no new ST segment changes or exercise-induced chest pain symptoms, when achieving maximal levels of exercise
 - Normal or small myocardial perfusion defect at rest or with stress involving < 5% of the myocardium
 - Normal stress or no change of baseline wall motion abnormalities during stress
 - CAC score < 100 Agatston units (only for use in primary prevention, not for heart catheterization decision making) ^(1,4,11,28)
 - No coronary stenosis > 50% on CCTA
- Global Risk of Cardiovascular Disease
 - **Global risk** of CAD is defined as the probability of manifesting cardiovascular disease over the next 10 years and refers to **asymptomatic** patients without known cardiovascular disease. It should be determined using one of the risk calculators below. A high risk is considered greater than a 20% risk of a cardiovascular event over the ensuing 10 years.
 - **CAD Risk—Low**
 - 10-year absolute coronary or cardiovascular risk less than 10%
 - **CAD Risk—Moderate**
 - 10-year absolute coronary or cardiovascular risk between 10% and 20%
 - **CAD Risk—High**
 - 10-year absolute coronary or cardiovascular risk of greater than 20%
 - **NOTE:** High global risk by itself generally lacks scientific support as an indication for stress imaging. ⁽²⁹⁾ There are rare exemptions, such as patients requiring I-C antiarrhythmic drugs, who might require coronary risk stratification prior to initiation of the drug, when global risk is moderate or high.

Websites for Global Cardiovascular Risk Calculators* (28,30–33)

Risk Calculator	Websites for Online Calculator
Framingham Cardiovascular Risk	https://reference.medscape.com/calculator/framingham-cardiovascular-disease-risk
Reynolds Risk Score Can use if no diabetes Unique for use of family history	http://www.reynoldsriskscore.org/
Pooled Cohort Equation	http://clincalc.com/Cardiology/ASCVD/PooledCohort.aspx?example
ACC/AHA Risk Calculator	http://tools.acc.org/ASCVD-Risk-Estimator/
MESA Risk Calculator With addition of Coronary Artery Calcium Score, for CAD-only risk	https://www.mesa-nhlbi.org/MESACHDRisk/MesaRiskScore/RiskScore.aspx

*Patients who have already manifested cardiovascular disease are already at high global risk and are not applicable to the calculators.

- Definitions of Coronary Artery Disease (1,4,13,34)
 - Percentage stenosis refers to the reduction in diameter stenosis when angiography is the method and can be estimated or measured using angiography or more accurately measured with intravascular ultrasound (IVUS).
 - Coronary artery calcification is a marker of risk, as measured by Agatston score on coronary artery calcium imaging. It is not a diagnostic tool so much as it is a risk stratification tool. Its incorporation into global risk can be achieved by using the Multi-Ethnic Study of Atherosclerosis (MESA) risk calculator.
 - Ischemia-producing disease (also called hemodynamically or functionally significant disease, or obstructive coronary disease for which revascularization might be appropriate) implies at least one of the following:
 - Suggested by percentage diameter stenosis $\geq 70\%$ by angiography; intermediate lesions are 50 – 69% ⁽¹¹⁾

- For a left main artery, suggested by a percentage stenosis $\geq 50\%$ or minimum luminal cross-sectional area on IVUS ≤ 6 square mm ^(2,12,34)
- FFR (fractional flow reserve) ≤ 0.80 for a major vessel ^(2,34)
- iFR (instantaneous wave-free ratio) ≤ 0.89 for a major vessel ^(2,35,36)
- A major vessel would be a coronary vessel that would be amenable to revascularization, if indicated. This assessment is made based on the diameter of the vessel and/or the extent of myocardial territory served by the vessel.
- FFR is the distal to proximal pressure ratio across a coronary lesion during maximal hyperemia induced by either intravenous or intracoronary adenosine. Less than or equal to 0.80 is considered a significant reduction in coronary flow.
- Instantaneous wave-free ratio (iFR) measures the ratio of distal coronary to aortic pressure during the wave free period of diastole, with a value ≤ 0.89 considered hemodynamically significant. ^(35,36)
- Anginal Equivalent ^(12,37,38)
 - Development of an anginal equivalent (e.g., shortness of breath, fatigue, or weakness) either with or without prior coronary revascularization should be based upon the documentation of reasons that symptoms other than chest discomfort are not due to other organ systems (e.g., dyspnea due to lung disease, fatigue due to anemia), by presentation of clinical data such as respiratory rate, oximetry, lung exam, etc. (as well as D-dimer, chest CT(A), and/or PFTs, when appropriate), and then incorporated into the evaluation of coronary artery disease as would chest discomfort. Syncope per se is not an anginal equivalent.
- Optimal Medical Therapy (OMT)
 - In general, a trial of OMT includes
 - Anti-platelet therapy
 - Lipid-lowering therapy
 - Beta blocker
 - Angiotensin converting enzyme (ACE) inhibitor

AUC Score

A reasonable diagnostic or therapeutic procedure can be defined as that for which the expected clinical benefits outweigh the associated risks, enhancing patient care and health outcomes in a cost-effective manner. ⁽⁸⁾

- Appropriate Care - Median Score 7-9
- May be Appropriate Care - Median Score 4-6
- Rarely Appropriate Care - Median Score 1-3

Acronyms/Abbreviations

CABG: Coronary artery bypass grafting

CAC: Coronary artery calcium
CAD: Coronary artery disease
CCT: Cardiac computed tomography
CCTA: Coronary computed tomographic angiography
CMR: Cardiac magnetic resonance
CT(A): Computed tomography (angiography)
ECG: Electrocardiogram
EF: Ejection fraction
FFR: Fractional flow reserve
FFR-CT: Fractional flow reserve – computed tomography
GDMT: Guideline-directed medical therapy
HCM: Hypertrophic cardiomyopathy
iFR: Instantaneous wave-free ratio
IVUS: Intravascular ultrasound
LV: Left ventricular
LVEF: Left ventricular ejection fraction
LVOT: Left ventricular outflow tract
MESA: Multi-Ethnic Study of Atherosclerosis
MI: Myocardial infarction
MR: Mitral regurgitation
OMT: Optimal medical therapy
PCI: Percutaneous coronary intervention
PFT: Pulmonary function test
SRT: Septal reduction therapy
TAVR: Transcatheter aortic valve replacement
TID: Transient ischemic dilation
TTE: Transthoracic echocardiography
TEE: Transesophageal echocardiography
VT: Ventricular tachycardia
VF: Ventricular fibrillation

SUMMARY OF EVIDENCE

2012 ACCF/AHA/ACP/AATS/PCNA/SCAI/STS guideline for the diagnosis and management of patients with stable ischemic heart disease ⁽¹⁾

Study Design: This document is a guideline for the diagnosis and management of patients with stable ischemic heart disease. It was developed by the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, along with other medical organizations.

Target Population: Patients with stable ischemic heart disease.

Key Factors: The guideline covers various aspects, including the methodology and evidence overview, clinical evaluation, noninvasive testing, risk assessment, treatment, and patient follow-up. It emphasizes the importance of patient involvement in decision-making and provides detailed recommendations for diagnosis and management.

ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 Appropriate Use Criteria for Diagnostic Catheterization ⁽¹¹⁾

Study Design: This document provides appropriate use criteria for diagnostic catheterization. It was developed by the American College of Cardiology Foundation Appropriate Use Criteria Task Force and other medical organizations.

Target Population: Patients undergoing diagnostic catheterization for various cardiovascular conditions.

Key Factors: The document includes 166 clinical scenarios rated for the appropriateness of diagnostic catheterization. It focuses on the performance of coronary angiography and hemodynamic measurements for evaluating coronary artery disease, valvular heart disease, pulmonary hypertension, and cardiomyopathies. The criteria aim to guide physician decision-making, healthcare delivery, and reimbursement policy.

ACC/AHA/ASE/ASNC/ASPC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2023 Multimodality Appropriate Use Criteria for the Detection and Risk Assessment of Chronic Coronary Disease ⁽³⁾

Study Design: This document is an update of the multimodality appropriate use criteria for the detection and risk assessment of chronic coronary disease. It was developed by the American College of Cardiology Solution Set Oversight Committee and other medical organizations.

Target Population: Patients with chronic coronary disease, including those with symptoms of ischemia, prior myocardial infarction, or revascularization, and those undergoing assessment for exercise programs or cardiac rehabilitation.

Key Factors: The document provides ratings for various diagnostic modalities, including exercise ECG, stress nuclear MPI, stress echocardiography, stress CMR, coronary artery calcium scoring, coronary computed tomography angiography, and invasive coronary angiography. It emphasizes the importance of appropriate test selection based on clinical scenarios and patient characteristics.

ANALYSIS OF EVIDENCE

Shared Findings ^(1,3,11)

All three articles emphasize the importance of heart catheterization in diagnosing and managing cardiovascular diseases. They agree on the necessity of using heart catheterization for accurate diagnosis and risk assessment, especially in patients with suspected or known coronary artery disease (CAD).

- **Diagnostic Accuracy:** All articles highlight the high diagnostic accuracy of heart catheterization in detecting obstructive CAD. They emphasize that heart catheterization provides detailed information about coronary anatomy and helps in identifying the severity of stenosis.
- **Risk Assessment:** The articles agree on the role of heart catheterization in risk assessment. They mention that heart catheterization helps in evaluating the risk of future cardiovascular events and guides treatment decisions.
- **Guidelines and Recommendations:** All three articles are developed by reputable medical organizations and provide guidelines and recommendations for the appropriate use of heart catheterization. They emphasize evidence-based practices and aim to improve patient outcomes

Conclusion ^(1,3,11)

The evidence presented in these articles reiterates the importance of heart catheterization in diagnosing and managing cardiovascular diseases. They highlight the high diagnostic accuracy and risk assessment capabilities of heart catheterization, which are crucial for guiding treatment decisions and improving patient outcomes.

In summary, while the articles share common conclusions about the importance of heart catheterization, they differ in their specific focuses and recommendations based on their contexts. Together, they provide a comprehensive understanding of the role of heart catheterization in diagnosing and managing cardiovascular diseases.

POLICY HISTORY

Date	Summary
July 2025	● Reviewed to reconcile dates, no substantive changes made
June 2025	● Added a Summary of Evidence and Analysis of Evidence
April 2025	● This guideline merges and replaces two Evolent guidelines with identical clinical criteria: ECG 7295-01 for Heart Catheterization and ECG 065 for Heart Catheterization into Evolent Clinical Guideline 7295 for Heart Catheterization ○ This guideline also merges Procedure Codes from these two Evolent guidelines

Date	Summary
	• Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Updated stress imaging in Stable Ischemic Heart Disease and corresponding Definitions in the Background section per recent societal appropriate use criteria reference • Updated references

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

Disclaimer

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Evolent Clinical Guideline 2058 for Tumor Imaging Positron Emission Tomography (PET)

Any Site, Breast Cancer, Melanoma

Guideline Number: Evolent_CG_2058	<u>Applicable Codes</u>	
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Original Date: January 2026	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

- *It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.*
- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

- Positron Emission Tomography (PET) imaging, any site, not otherwise specified, is a non-covered CPT code.
- PET scan imaging, full and partial-ring pet scanners only, for initial diagnosis of breast cancer and/or surgical planning for breast cancer (e.g., initial staging of axillary lymph nodes) is not medically necessary and is therefore a non-covered study ^(1,2)
- PET scan for whole body; melanoma for non-covered indications is not medically necessary and is therefore a non-covered study ^(3,4)

CODING AND STANDARDS

Coding

G0219, G0235, G0252

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

SUMMARY OF EVIDENCE

Ultrasound, CT, MRI, or PET-CT for staging and re-staging of adults with cutaneous melanoma (Review) ⁽⁴⁾

Study Design: This is a systematic review published in the Cochrane Database of Systematic Reviews. It evaluates the diagnostic accuracy of imaging tests (Ultrasound, CT, MRI, PET-CT) for staging and re-staging adults with cutaneous melanoma.

Target Population: Adults with confirmed cutaneous invasive melanoma undergoing imaging for staging purposes.

Key Factors:

- **Objectives:** To determine the diagnostic accuracy of imaging tests for detecting nodal and distant metastases before sentinel lymph node biopsy (SLNB) and for whole-body imaging.
- **Methods:** Comprehensive search of multiple databases up to August 2016, including studies of any design that evaluated the imaging tests compared with histological confirmation or imaging with clinical follow-up.
- **Results:** 39 publications reporting on 5204 study participants. The accuracy of imaging for detection of regional nodal metastases before SLNB was evaluated in 18 studies. Summary sensitivity of ultrasound alone was 35.4% and specificity was 93.9%. Combining ultrasound with FNAC revealed summary sensitivity of 18.0% and specificity of 99.8%. Limited test accuracy data were available for whole-body imaging via PET-CT for primary staging or re-staging for disease recurrence.
- **Conclusions:** There is a lack of evidence on the accuracy of imaging in people with melanoma at different points on the clinical pathway. Imaging with ultrasound combined with FNAC before SLNB may identify around one-fifth of those with nodal disease, but further work is needed to establish cost-effectiveness.

The role of FDG-PET/CT in preoperative staging of sentinel lymph node biopsy-positive melanoma patient ⁽³⁾

Study Design: This is a retrospective multicenter cohort study conducted in the Region of Southern Denmark.

Target Population: Malignant melanoma (MM) patients with a positive sentinel lymph node biopsy (SLNB) who subsequently underwent FDG-PET/CT prior to lymph node dissection (LND).

Key Factors:

- **Objectives:** To determine FDG-PET/CT's efficacy in finding distant metastasis and its influence on subsequent diagnostic testing and treatment.
- **Methods:** Patient information was acquired from the Danish Melanoma Database and cross-referenced with OUH's patient records. The study included 46 patients from April 1, 2015 to April 1, 2016.
- **Results:** FDG-PET/CT did not uncover any distant metastases or lead to any alterations in treatment strategy. However, it provided false positive findings in 13% of patients, triggering additional procedures that did not impact the therapeutic strategy.
- **Conclusions:** The new diagnostic strategy did not find any MM metastases or uncover anything else of relevance. FDG-PET/CT provided false positive findings, indicating a need for re-evaluation of this strategy and further clinical trials.

PET Molecular Imaging in Breast Cancer: Current Applications and Future Perspectives ⁽²⁾

Study Design: This is a review article published in the Journal of Clinical Medicine.

Target Population: Breast cancer patients.

Key Factors:

- **Objectives:** To address the role of PET imaging in breast cancer care, focusing on the utility of 18F-fluorodeoxyglucose (FDG) PET in staging, recurrence detection, and treatment response evaluation.
- **Methods:** The review discusses current applications and future perspectives of PET molecular imaging in breast cancer, including novel radiopharmaceuticals and the integration of AI.
- **Results:** PET/CT is not routinely recommended for primary diagnosis due to high cost and limited sensitivity. However, it offers superior performance in detecting extra-axillary nodal and distant metastases in newly diagnosed stage III breast cancer. PET/CT is valuable for evaluating response to neoadjuvant chemotherapy and detecting recurrence. Novel PET radiotracers like 68Ga-FAPI and 18F-FES show promise in assessing various tumor behaviors and enhancing detection precision.
- **Conclusions:** PET/CT plays a crucial role in breast cancer management, with advancements in imaging techniques and precision medicine tracers offering significant improvements in diagnostic accuracy

ANALYSIS OF EVIDENCE

Shared Findings ^(2–4):

- **Diagnostic Accuracy:** All three studies highlight the diagnostic accuracy of PET imaging in detecting metastases. Dinnes et al 2019 and Frary et al 2016 focus on melanoma, while Katal et al 2024 discusses breast cancer. PET imaging is recognized for its ability to detect distant metastases, although its accuracy varies depending on the cancer type and stage.
- **False Positives:** Both Frary et al 2016 and Dinnes et al 2019 mention the occurrence of false positives in PET imaging. Frary et al 2016 reports a 13% false positive rate, while Dinnes et al 2019 notes the limited accuracy data available for PET-CT21.
- **Need for Further Research:** All studies emphasize the need for further research to establish the cost-effectiveness and clinical utility of PET imaging. Dinnes et al 2019 calls for more studies on the accuracy of imaging tests, Frary et al 2016 suggests re-evaluation of the diagnostic strategy, and Katal et al 2024 highlights the potential of novel radiotracers.

Conclusion ^(2–4):

In summary, while all three studies recognize the importance of PET imaging in cancer management, they differ in their focus on specific cancer types, patient populations, and the integration of innovative imaging techniques. Further research is needed to address the limitations and validate the findings across different clinical settings.

POLICY HISTORY

Date	Summary
June 2025	● Added a subtitle: Any Site, Breast Cancer, Melanoma
May 2025	● This guideline replaces Evolent Clinical Guideline 070-2 for Tumor Imaging PET Any Site (Unlisted PET) ● This guideline replaces Evolent Clinical Guideline 070-3 for Tumor Imaging PET - Breast Cancer - Initial Diagnosis ● This guideline replaces Evolent Clinical Guideline 070-4 for Tumor Imaging PET Melanoma (Noncovered Indications)

LEGAL AND COMPLIANCE

Guideline Approval

Committee

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REFERENCES

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Evolent Clinical Guideline 2031 for Low Field Magnetic Resonance Imaging (MRI)

Guideline Number: Evolent_CG_2031	<u>Applicable Codes</u>	
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Original Date: July 2009	Last Revised Date: June 2025	Implementation Date: January 2026

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STATEMENT

General Information

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- *Where a specific clinical indication is not directly addressed in this guideline, medical necessity determination will be made based on widely accepted standard of care criteria. These criteria are supported by evidence-based or peer-reviewed sources such as medical literature, societal guidelines and state/national recommendations.*
- *The guideline criteria in the following sections were developed utilizing evidence-based and peer-reviewed resources from medical publications and societal organization guidelines as well as from widely accepted standard of care, best practice recommendations.*

Special Note

Low Field MRI services are not considered to be medically necessary.

CODING AND STANDARDS

Codes

S8042

Applicable Lines of Business

☒	CHIP (Children's Health Insurance Program)
☒	Commercial
☒	Exchange/Marketplace
☒	Medicaid
☒	Medicare Advantage

BACKGROUND

MRI Scanners

MRI scanners with a field strength of greater than 1.0 Tesla (T) are considered high field. The typical high field MRI units in clinical practice range between 1.0 – 3.0 Tesla.

The definition of mid and low field MRI is more variable with mid field units having a lower field strength range of 0.3 to 0.5 and an upper limit under 1.0 T. Low field units have field strengths below 0.3 to 0.2 T.

POLICY HISTORY

Date	Summary
June 2025	• This guideline number changed from 064 to 2031 • Added in general information statement regarding guideline criteria development by reputable sources, standard of care, and best practices • Background section reduced • No significant content changes
March 2024	• No significant changes

LEGAL AND COMPLIANCE

Guideline Approval

Committee

Reviewed / Approved by Evolent Specialty Services Clinical Guideline Review Committee

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