



Magellan Healthcare	
Clinical guideline TRANSESOPHAGEAL (TEE) ECHO	Original Date: October 2009 Page 1 of 6
CPT codes: 93312, 93313, 93314, 93315, 93316, 93317, 93318, +93320, +93321, +93325	Last Review Date: September 2017
Guideline Number: NIA_CG_066	Last Revised Date: September 2017
Responsible Department: Clinical Operations	Implementation Date: January 2018

INTRODUCTION:

Echocardiography also known as ‘cardiac ultrasound’ is a diagnostic test that uses ultrasound waves to create an image of the heart muscle. Ultrasound waves that rebound or echo off the heart can show the size, shape, and movement of the heart's valves and chambers as well as the flow of blood through the heart.

Transesophageal Echocardiogram (TEE) is an alternative way to perform an echocardiogram where the probe is passed into patient’s esophagus and appropriately used as an adjunct or subsequent test to TTE when suboptimal TTE images preclude obtaining a diagnostic study.

Initial Clinical Reviewers (ICRs) and Physician Clinical Reviewers (PCRs) must be able to apply criteria based on individual needs and based on an assessment of the local delivery system.

INDICATIONS FOR TRANSESOPHAGEAL ECHOCARDIOGRAPHY (TEE):

ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR based Appropriate Use Criteria, including updates through September, 2017

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (4-9); A= Appropriate; U=Uncertain
TEE as Initial or Supplemental Test—General Uses		
99	<ul style="list-style-type: none"> Use of TEE after nondiagnostic TTE or when there is a high likelihood of a nondiagnostic TTE due to patient characteristics or inadequate visualization of relevant structures, such as a prosthetic valve dysfunction, left atrial thrombus, patent foramen ovale, etc. 	A(8)

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (4-9); A= Appropriate; U=Uncertain
99a	<ul style="list-style-type: none"> Inadequate TTE images, for the evaluation of possible valvular heart disease or prosthetic valve dysfunction. 	A(8)
101	<ul style="list-style-type: none"> Re-evaluation of prior TEE finding for interval change (e.g., resolution of thrombus after anticoagulation, resolution of vegetation after antibiotic therapy) when a change in therapy is anticipated 	A(8)
103	<p>Either ONE of the following:</p> <ul style="list-style-type: none"> Guidance during percutaneous noncoronary cardiac interventions including but not limited to closure device placement, radiofrequency ablation, and percutaneous valve procedures For intraoperative noncoronary cardiac repair, including, but not limited to, valve repair, congenital defect repair, unanticipated findings or complications of cardiac surgery requiring intraoperative imaging 	A(9)
104	<ul style="list-style-type: none"> Suspected acute aortic pathology including but not limited to dissection/transsection when CTA and MRI are either not available or not conclusive or not thought to be the optimal first imaging test for clinical reasons. 	A(9)
104a	<ul style="list-style-type: none"> Dilated aortic sinuses or ascending aorta or a bicuspid aortic valve (stages A and B), to evaluate the presence and severity of AR Suboptimal TTE images 	U(5)
TEE as Initial or Supplemental Test—Valvular Disease		
106	<ul style="list-style-type: none"> Evaluation of valvular structure, native and prosthetic, and function to assess suitability for, and assist in planning of, an intervention 	A(9)
106a	<ul style="list-style-type: none"> Symptomatic, severe aortic stenosis by calculated valve area Low Flow/low gradient Low left ventricular ejection fraction Dobutamine stress echocardiogram is not appropriate TTE not adequate 	U(5)

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (4-9); A= Appropriate; U=Uncertain
106b	<ul style="list-style-type: none"> • Severe aortic stenosis, by calculated valve area • Low Flow/low gradient • Preserved left ventricular ejection fraction and for assessment of morphology, including calcification • TTE not adequate 	U(6)
106c	<ul style="list-style-type: none"> • Mitral stenosis • Discrepancy between resting Doppler echocardiographic findings and clinical symptoms or signs • To evaluate mean mitral gradient and pulmonary artery pressure • Exercise stress echocardiography is not possible • TTE not adequate 	U(6)
106d	<ul style="list-style-type: none"> • Clinically suspected severe MR • Underestimation on TTE despite optima images • Better imaging of MR jet needed 	A(9)
106e	<ul style="list-style-type: none"> • Chronic symptomatic primary MR with discrepancy between exertional symptoms and the severity of MR at rest; symptoms are disproportionate to the severity of MR determined at rest • Exercise stress echocardiography not more suitable. • TTE not adequate 	A(7)
106f	<ul style="list-style-type: none"> • Chronic asymptomatic patient, to distinguish between moderate or severe primary MR • TTE not adequate 	A(7)
106g	<ul style="list-style-type: none"> • Discordance between clinical assessment and TTE and the severity of AR 	A(8)
108	<ul style="list-style-type: none"> • To diagnose infective endocarditis and cardiac complications of infective endocarditis, with a moderate or high pretest probability (e.g., staph bacteremia, fungemia, prosthetic heart valve, or intracardiac device) 	A(9)
108a	<ul style="list-style-type: none"> • Re-evaluation of IE in a patient with a change in clinical status or cardiac 	A(8)

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (4-9); A= Appropriate; U=Uncertain
	examination (e.g., new murmur, embolism, persistent fever, HF, abscess, or atrioventricular heart block)	
108b	<ul style="list-style-type: none"> Re-evaluation of IE if the patient is at high risk for progression/complications or for other potential treatment-altering changes TTE not adequate 	A(7-8)
TEE as Initial or Supplemental Test—Embolitic Event		
109	<ul style="list-style-type: none"> Evaluation of suspected cardiac mass, tumor, or thrombus, or for evaluation of potential cardiac source of embolism when there is no identified noncardiac source 	A(7)
110	<ul style="list-style-type: none"> Evaluation for cardiovascular source of embolus with a previously identified noncardiac source 	U(5)
TEE as Initial Test—Atrial Fibrillation/Flutter		
112	<ul style="list-style-type: none"> Evaluation to facilitate clinical decision making with regards to anticoagulation, cardioversion, and/or radiofrequency ablation 	A(9)
TAVR (Transcatheter Aortic Valve Replacement)		
113	<ul style="list-style-type: none"> Accurate assessment of annular size and shape, which does not exclude concomitant use of CMR or CCT for accuracy purposes. 	A(7)
114	<ul style="list-style-type: none"> Assessment of number of cusps and degree of calcification 	A(7)
116	<ul style="list-style-type: none"> Assessment of degree of aortic regurgitation (including valvular and paravalvular) with suspicion of valve dysfunction, if TTE is inadequate 	A(7)
117	<ul style="list-style-type: none"> Assessment of stroke with suspicion of valve dysfunction, if TTE is inadequate 	U(6)
Percutaneous Mitral Valve Repair		
118	<ul style="list-style-type: none"> Determination of patient eligibility 	A(9)
119	<ul style="list-style-type: none"> Exclude the presence of intracardiac mass, thrombus, or vegetation prior to (within 3 days) the procedure 	A(9)

TEE in Critical Care:

TEE is a useful test that can be performed relatively quickly at the bedside in critically ill patients. Indications for TEE in the critically ill are similar to standard TEE indications in all patients. However, certain scenarios in a critically ill patient may be more quickly and thoroughly investigated with TEE as the initial diagnostic procedure, including ONE of the following:

- Unexplained hypotension
- Unexplained hypoxemia
- Suspected complications following a myocardial infarction (i.e., acute mitral regurgitation, ventricular septal defect, free wall rupture with cardiac tamponade)
- Uncertain volume status
- Blunt chest trauma

INDICATIONS IN ACC GUIDELINES WITH “INAPPROPRIATE” DESIGNATION:

Patients that meet ACCF/ASNC Inappropriate use score of (1-3) noted below OR meet any one of the following:

- For same imaging test less than 52 weeks (1 year) apart unless specific guideline criteria states otherwise.
- For different imaging tests of same anatomical structure but different imaging type less than six (6) weeks (such as Heart MRI/CT) unless specific guideline criteria states otherwise (i.e. CT/MRI and now wants Echocardiogram) without high level review to evaluate for medical necessity.
- Additional images for same-study (poor quality, etc.).

ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR based Appropriate Use Criteria, including updates through September, 2017

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (1-3); I= Inappropriate
<i>TEE as Initial or Supplemental Test—General Uses</i>		
100	<ul style="list-style-type: none"> • Routine use of TEE when a diagnostic TTE is reasonably anticipated to resolve all diagnostic and management concerns 	I(1)
102	<ul style="list-style-type: none"> • Surveillance of prior TEE finding for interval change (e.g., resolution of thrombus after anticoagulation, resolution of vegetation after antibiotic therapy) when no change in therapy is anticipated 	I(2)
105	<ul style="list-style-type: none"> • Routine assessment of pulmonary veins in an asymptomatic patient status post pulmonary vein isolation 	I(3)
<i>TEE as Initial or Supplemental Test—Valvular Disease</i>		

ACCF et al. Criteria # TEE (Indication and Appropriate Use Score)	INDICATIONS	APPROPRIATE USE SCORE (1-3); I= Inappropriate
107	<ul style="list-style-type: none"> To diagnose infective endocarditis with a low pretest probability (e.g., transient fever, known alternative source of infection, or negative blood cultures/atypical pathogen for endocarditis) 	I(3)
<i>TEE as Initial or Supplemental Test—Embolic Event</i>		
111	<ul style="list-style-type: none"> Evaluation for cardiovascular source of embolus with a known cardiac source in which a TEE would not change management 	I(1)
<i>TEE as Initial Test—Atrial Fibrillation/Flutter</i>		
113	<ul style="list-style-type: none"> Evaluation when a decision has been made to anticoagulate and not to perform cardioversion 	I(2)

ADDITIONAL INFORMATION:

Abbreviations:

ACS = acute coronary syndrome
 APC = atrial premature contraction
 CABG = coronary artery bypass grafting surgery
 CAD = coronary artery disease
 CMR = cardiovascular magnetic resonance
 CRT = cardiac resynchronization therapy
 CT = computed tomography
 ECG = electrocardiogram
 HF = heart failure
 ICD = implantable cardioverter-defibrillator
 LBBB = left bundle-branch block
 LV = left ventricular
 MET = estimated metabolic equivalents of exercise
 MI = myocardial infarction
 RNI = radionuclide imaging
 SPECT MPI = single-photon emission computed tomography myocardial perfusion imaging
 STEMI = ST-segment elevation myocardial infarction
 SVT = supraventricular tachycardia
 TEE = transesophageal echocardiogram
 TIA = transient ischemic attack
 TIMI = Thrombolysis in Myocardial Infarction
 TTE = transthoracic echocardiogram
 UA/NSTEMI = unstable angina/non-ST-segment elevation myocardial infarction
 VPC = ventricular premature contraction

VT = ventricular tachycardia
PCI = percutaneous coronary intervention

REFERENCES

- Armstrong, W.F., & Zoghbi, W.A. (2005 June). Stress Echocardiography: Current methodology and clinical applications. *J Am Coll Cardiol.* 45(11), 1739-1747. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0735109705005346>
- Ayers, NA, Miller-Hance W., Fyfe DA., Stevenson JG., Sahn DJ., Young LT., Minich LL., et al. (2005) Indications and Guidelines for Performance of Transesophageal Echocardiography in the Patient with Pediatric Acquired or Congenital Heart Disease - A Report from the Task Force of the Pediatric Council of the American Society of Echocardiography, *J Am Soc Echocardiogram* 2005;18:91-8.
- Badano LP, Miglioranza MH., Edvardsen T., Colafranceschi AS., Murare D., Bacal F., Nieman K., et al. (2015) European Association of Cardiovascular Imaging/ Cardiovascular Imaging Department of the Brazilian Society of Cardiology recommendations for the use of cardiac imaging to assess and follow patients after heart transplantation. DOI: <http://dx.doi.org/10.1093/ehjci/jev139> 919-948 First published online: 2 July 2015
- Doherty JU, Kort S, Mehran R, Schoenhagen P, Soman P. (2017) ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2017 Appropriate Use Criteria for Multimodality Imaging in Valvular Heart Disease DOI: 10.1016/j.jacc.2017.07.732.
- Douglas PS, Garcia MJ, Haines DE, Lai WW, Manning WJ, Patel AR, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography. A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, a... *J Am Coll Cardiol.* 2011 Mar 1. 57(9):1126-66
- Lancellotti, P, Tribouilloy C., Hagendorff A., Popescu BA., Edvardsen T., Pierard LA., Badano L., Samorano JL. (2013) Recommendations for the echocardiographic assessment of native valvular regurgitation: an executive summary from the European Association of Cardiovascular Imaging *Eur Heart J Cardiovasc Imaging* Jul 2013, 14 (7) 611-644; DOI: 10.1093/ehjci/jet105
- Manning WJ, Kannan, JP. (2015) Transesophageal echocardiography: Indications, complications, and normal views. Up-to-Date. <http://www.uptodate.com/contents/transesophageal-echocardiography-indications-complications-and-normal-views>
- Nagueh SF., Smiseth OA., Appleton CP., Byrd BF., Dokainish H., Edvardsen T., et al. Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography: An Update from the American Society of Echocardiography and the

European Association of Cardiovascular Imaging. J Am Soc Echocardiogr 2016;29:277-314. http://asecho.org/wordpress/wp-content/uploads/2016/03/2016_LVDiastolicFunction.pdf

Nishimura RA, Otto CM, Bonow RO, Carabello BA., Erwin JP., Guyton RA. et al. 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2014; 63(22):2438-2488. doi:10.1016/j.jacc.2014.02.537.

Ogbara, J., Logani, S., Ky, B., Chirinos, J. A., Silvestry, F. E., Eberman, K., . . . Kirkpatrick, J. N. (2011). The Utility of Prescreening Transesophageal Echocardiograms: A Prospective Study. *Echocardiography*, 28(7), 767-773. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1540-8175.2011.01421.x/abstract>


Pelikka, P.A., Nagueh, S.F., Elhenda, A.A., Kuehl, C.A., & Sawada, S.G. (2007). American Society of Echocardiography recommendations for performance, interpretation, and application of stress echocardiography. *Journal of the American Society of Echocardiography: Official Publication of the American Society of Echocardiography.* 20(9), 1021-1041. Retrieved from http://www.suc.org.uy/emcc2008/Curso_Imag_2008_archivos/Bibliografia/Ecoestres/Guias%20STRESS%20ASECHO_2007.pdf

Porter TR, Shillcutt SK., Adams MS., Desjardins G., Glas KE., Olson JJ., Troughton RW. (2015) Guidelines for the Use of Echocardiography as a Monitor for Therapeutic Intervention in Adults: A Report from the American Society of Echocardiography, J Am Soc Echocardiogr 2015;28:40-56.

Saric M, Armour AC., Arnaout MS., Chaudhry FA., Grimm RA., Kronzon I., Landeck BR., et al. (2016) Guidelines for the Use of Echocardiography in the Evaluation of a Cardiac Source of Embolism. J Am Soc Echocardiogr 2016; 29:1-42. http://asecho.org/wordpress/wp-content/uploads/2016/01/2016_Cardiac-Source-of-Embolism.pdf

Stainback, RF, Estep JD., Agler DA., Birks EJ., Bremer M., Hung J., et al. (2015) Echocardiography in the Management of Patients with Left Ventricular Assist Devices: Recommendations from the American Society of Echocardiography, J Am Soc Echocardiogr 2015;28:853-909. DOI: <http://dx.doi.org/10.1016/j.echo.2015.05.008>

Thys, DM., Abel MD., Brooker RF., Cahalan MK., Connis RT., Duke PG., Nickinovich DG. et al. (2010) Practice Guidelines for Perioperative Transesophageal Echocardiography - An Updated Report by the American Society of Anesthesiologists and the Society of Cardiovascular Anesthesiologists Task Force on Transesophageal Echocardiography, *Anesthesiology*, May 2010, No 5, V 112: 1-7

Reviewed/Approved by  Michael Pentecost, MD, Chief Medical Officer