National Imaging Associates, Inc.*	
Clinical guidelines CHEST (Thorax) CT	Original Date: September 1997
CPT Codes: 71250, 71260, 71270, 71271	Last Revised Date: March 2022
Guideline Number: NIA_CG_020	Implementation Date: January 2023

This Chest CT Guideline covers CPT codes 71250 (CT chest without contrast), CT chest with contrast (71260), CT chest without and with contrast (71270) and Low dose CT scan (LDCT) for lung cancer screening (71271). **When the case is listed as CT chest in BBI and the clinical scenario or request for LDCT in the office notes meets appropriate use criteria for a LDCT, the LDCT is approvable due to these overlapping CPT codes. Reprocessing of the case to a separate LDCT request is not required.**

INDICATIONS FOR CHEST CT

For Annual Lung Cancer Screening
The use of low-dose, non-contrast spiral (helical) multi-detector CT imaging as an annual screening technique for lung cancer is considered **medically necessary ONLY** when used to screen for lung cancer for certain high-risk **asymptomatic** individuals when **ALL** of the following criteria are met[1]:

- Individual is between 50-80 years of age; AND
- There is at least a 20 pack-year history of cigarette smoking; AND
- If the individual is a former smoker, that individual had quit smoking within the previous 15 years

Nodule on Initial LDCT[2]
- If multiple nodules, the largest and type is used for decision
- Follow-up with LDCT as per Lung-Rads criteria[3, 4] (Table 1)

Table 1: Lung-RADS® Assessment Categories[5]

Category Descriptor	Lung-RADS Score	Findings	Management
Incomplete	0	Prior chest CT examination(s) being located for comparison Part or all of lungs cannot be evaluated	Additional lung cancer screening CT images and/or comparison to prior chest CT examinations is needed
Negative No nodules and definitely benign nodules	1	No lung nodules Nodule(s) with specific calcifications: complete, central, popcorn, concentric rings and fat containing nodules	Continue annual screening with LDCT in 12 months
Benign Appearance or Behavior Nodules with a very low likelihood of becoming a clinically active cancer due to size or lack of growth	2	**Perifissural nodule(s)** *(See Footnote 11)* < 10 mm (524 mm^3) **Solid nodule(s):** < 6 mm (< 113 mm^3) new < 4 mm (< 34 mm^3) **Part solid nodule(s):** < 6 mm total diameter (< 113 mm^3) on baseline screening **Non solid nodule(s) (GGN):** <30 mm (<14137 mm^3) **OR** ≥ 30 mm (≥ 14137 mm^3) and unchanged or slowly growing Category 3 or 4 nodules unchanged for ≥ 3 months	
Probably Benign Probably benign finding(s) - short term follow up suggested; includes nodules with a low likelihood of becoming a clinically active cancer	3	**Solid nodule(s):** ≥ 6 to < 8 mm (≥ 113 to < 268 mm^3) at baseline **OR** new 4 mm to < 6 mm (34 to < 113 mm^3) **Part solid nodule(s)** ≥ 6 mm total diameter (≥ 113 mm^3) with solid component < 6 mm (< 113 mm^3) **OR** new < 6 mm total diameter (< 113 mm^3) **Non solid nodule(s)** (GGN) ≥ 30 mm (≥ 14137 mm^3) on baseline CT or new	6 month LDCT
Suspicious Findings for which additional diagnostic testing is recommended	4A	**Solid nodule(s):** ≥ 8 to < 15 mm (≥ 268 to < 1767 mm^3) at baseline **OR** growing < 8 mm (< 268 mm^3) **OR** new 6 to < 8 mm (113 to < 268 mm^3) **Part solid nodule(s):** ≥ 6 mm (≥ 113 mm^3) with solid component ≥ 6 mm to < 8 mm (≥ 113 to < 268 mm^3) **OR** with a new or growing < 4 mm (< 34 mm^3) solid component **Endobronchial nodule**	3 month LDCT; PET/CT may be used when there is a ≥ 8 mm (≥ 268 mm^3) solid component
Very Suspicious Findings for which additional diagnostic testing and/or tissue sampling is recommended	4B	**Solid nodule(s)** ≥ 15 mm (≥ 1767 mm^3) **OR** new or growing, and ≥ 8 mm (≥ 268 mm^3) **Part solid nodule(s) with:** a solid component ≥ 8 mm (≥ 268 mm^3) **OR** a new or growing ≥ 4 mm (≥ 34 mm^3) solid component	Chest CT with or without contrast, PET/CT and/or tissue sampling depending on the *probability of malignancy and comorbidities. PET/CT may be used when there is a ≥ 8 mm (≥ 268 mm^3) solid component. *For new large nodules that develop on an annual repeat screening CT, a 1 month LDCT may be recommended to address potentially infectious or inflammatory conditions*
	4X	Category 3 or 4 nodules with additional features or imaging findings that increases the suspicion of malignancy	
Other Clinically Significant or Potentially Clinically Significant Findings (non lung cancer)	S	**Modifier - may add on to category 0-4 coding**	As appropriate to the specific finding

Incidental Lung Nodules[6]

- Incidental pulmonary nodules detected on a nonscreening Chest CT (use Fleischner Table)
    - Age ≥ 35 years old – use Fleischner table
    - Excludes
        - Lung cancer screening (see lung cancer screening guidelines above)
        - History of primary cancer (imaging follow-up for surveillance is 3 months to detect interval nodule growth)
        - Immunosuppression (may require a shorter follow-up, such as 1 month, if suspicion of fulminant infection)

Note: These should not be ordered as Low Dose CT

- **Incidental pulmonary nodules on non-chest CT**
    - Nodules >8mm or those with very suspicious features need further Chest CT as early as possible
    - Nodules ≤ 8mm should follow the Fleischner table

Incidental pulmonary nodules on chest x-ray that are indeterminate (not typical of granulomatous disease) as noted by the radiologist. No time delay between the chest x-ray and the subsequent Chest CT needed).

Table 2: 2017 Fleischner Society Guidelines for Management of Incidentally Detected Pulmonary Nodules[6]

A: Solid Nodules*				
Nodule Type	Nodules <6 mm (<100 mm³)	Nodules 6–8 mm (100–250 mm³)	Nodules >8 mm (>250 mm³)	Comments
Single				
Low risk	No routine follow-up	CT at 6–12 mo, then consider CT at 18–24 mo	Consider CT at 3 mo, 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 mo	CT at 6–12 mo, then at 18–24 mo	Consider CT at 3 mo, PET/CT, or tissue sampling	Certain patients at high risk with suspicious nodule morphology, upper lobe location, or both may warrant 12-mo follow-up (recommendation 1A)
Multiple				
Low risk	No routine follow-up	CT at 3–6 mo, then consider CT at 18–24 mo	CT at 3–6 mo, then consider CT at 18–24 mo	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 mo	CT at 3–6 mo, then at 18–24 mo	CT at 3–6 mo, then at 18–24 mo	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	Nodules <6 mm (<100 mm³)	Nodules ≥6 mm (≥100 mm³)	Comments
Single			
Ground glass	No routine follow-up	CT at 6–12 mo to confirm persistence, then CT every 2 y until 5 y	For certain suspicious nodules <6 mm, consider follow-up at 2 y and 4 y; if solid component(s) develops or growth occurs, consider resection (recommendations 3A and 4A)
Partly solid	No routine follow-up	CT at 3–6 mo to confirm persistence; if lesion is unchanged and solid component remains <6 mm, annual CT should be performed for 5 y	In practice, partly solid nodules cannot be defined as such until they are ≥6 mm, and nodules <6 mm usually do not require follow-up; persistent partly solid nodules with a solid component ≥6 mm should be considered highly suspicious (recommendations 4A–4C)
Multiple	CT at 3–6 mo; if lesion is stable, consider CT at 2 y and 4 y	CT at 3–6 mo; subsequent management based on the most suspicious nodule(s)	Multiple <6-mm pure GGNs† usually are benign, but consider follow-up at 2 y and 4 y in select patients at high risk (recommendation 5A)

Known Cancer[7-9]

- For follow-up intervals for malignancies[10]
- Cancer staging (includes unknown primary)
- Cancer restaging
- Suspicious signs or symptoms of recurrence
- Suspected cancer based on prior imaging[11]

Chest Mass (non-lung parenchymal)[12]
(Preference should be given to MRI over chest CT for chest wall mass)
- Mass or lesion, including lymphadenopathy, after non-diagnostic initial imaging
- Thymoma screening in Myasthenia Gravis patients[13]

Interstitial Lung Disease[14, 15]
- Suspected or known based on restrictive pattern pulmonary function test or signs or symptoms after initial chest x-ray
- Signs or symptoms unresponsive to treatment such as:
    - Shortness of breath
    - Persistent dyspnea
    - Persistent cough
- Monitoring treatment response of known interstitial lung disease
- Patients with known collagen vascular disease[16]
- Guidance in selection of the most appropriate site for biopsy of diffuse lung disease[17]

Chronic Cough (> 8 weeks) and chest x-ray completed[18]
- After evaluation for other causes and failed treatment for those diagnosed with:
    - Asthma
    - Gastroesophageal Reflux Disease
    - Discontinuation of ACE inhibitors
    - Postnasal drip
- Clinical concern for bronchiectasis

Tuberculosis (TB)[19]
- Known or suspected tuberculosis and initial chest x-ray done

Infection Follow-up Imaging
- Abscess, empyema, or pleural effusions on chest x-ray[20]
- 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[21, 22]

Pneumothorax on Chest X-ray[23]

Vocal Cord Paralysis on Endoscopic Exam[24]
- Neck and Chest CT is an approvable combo

Granulomatosis with Polyangiitis (Wegener's Granulomatosis)[25]

Vascular Disease
- CT chest is not preferred study for vascular disease, CTA should be considered. See Chest CTA guideline.

- Chest CT can be used to detect and follow-up thoracic aortic aneurysms. See Background section.

Suspected Pulmonary Embolism (PE)[26]
- Chest CT not approvable for PE

Congenital Malformations
- Thoracic malformation on chest x-ray[27]
- Congenital Heart Disease with pulmonary hypertension[28]

Hemoptysis after x-ray completed[29, 30]

Pre-operative/procedural evaluation
- Pre-operative evaluation for a planned surgery or procedure
- Pre-operative evaluation for Electromagnetic Navigation Bronchoscopy[31]

Post-operative/procedural evaluation
- Post-surgical follow-up when records document medical reason requiring additional imaging

Chest Wall Pain (after initial evaluation with chest x-ray and/or rib films)[32]
- History of known or suspected cancer
- Signs and symptoms of infection, such as:
  - Accompanying fever
  - Elevated inflammatory markers
  - Known infection at other sites

Chest CT and COVID-19 (Coronavirus)
- Acute COVID
  - Imaging is not indicated in patients suspected of having coronavirus disease (COVID-19) and mild clinical features unless they are at risk for disease progression
  - Imaging is indicated in a patient with COVID-19 and worsening respiratory status
  - In a resource-constrained environment, imaging is indicated for medical triage of patients suspected of having COVID-19 who present with moderate-to-severe clinical features and a high pretest probability of disease
- Long (Chronic) COVID (See Overview)
  - Prior history of Covid with hypoxia or impaired lung function of follow-up[33]
    - Restricted diffusion on Pulmonary Function Test (would need a HRCT – High Resolution CT)
    - Low oxygen saturation and a Chest x-ray was done
  - Known fibrosis with continued symptoms

Combination of studies with Chest CT

- **Abdomen CT/Pelvis CT/Chest CT/Neck MRI/Neck CT with MUGA** – known tumor/cancer for initial staging or evaluation before starting chemotherapy or radiation treatment
- **Neck and Chest CT -** Neck and Chest CT is an approvable combo with vocal cord paralysis and concern for recurrent laryngeal nerve lesion

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BACKGROUND

Computed tomography (CT) scans provide greater clarity than regular x-rays and are used to further examine abnormalities found on chest x-rays. They may be used for detection and evaluation of various disease and conditions in the chest, e.g., tumor, inflammatory disease, vascular disease, congenital abnormalities, trauma, and symptoms such as hemoptysis.

OVERVIEW

LDCT for Lung Cancer Screening - Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

CT and Aneurysm
- Initial evaluation of aneurysm[34-36]
    - Echocardiogram shows aneurysm
    - Echocardiogram inconclusive of proximal aorta and first-degree relative with thoracic aneurysm
    - Chest x-ray shows possible aneurysm
- Follow-up after established Thoracic Aneurysm (above these sizes surgery is usually recommended)[34-36]
    - Aortic Root or Ascending Aorta
        - 3.5 to 4.5 Annual
        - 4.5 to 5.4 Every 6 months
    - Genetically mediated (Marfans syndrome, Aortic Root or Ascending Aorta
        - 3.5 to 4.0 Annual
        - 4.0 to 5.0 Every 6 months
    - Descending Aorta
        - 4.0 to 5.0 Annual
        - 5.0 to 6.0 Every 6 months

CT and Interstitial Lung Disease[14] – Radiography of the chest is usually appropriate for the initial imaging of patients who undergo screening and surveillance for lung disease when occupational exposure is present.

Costochondritis[37] – If physical exam findings are suggestive of costochondritis but the pain is persistent despite conservative care, it should be kept in mind that costochondritis can be recurrent and persistent. It is associated with fibromyalgia. Chest CT should be considered if the findings are not consistent with typical costochondritis, such as fever or elevated inflammatory markers, suggestive of infection or a suspicion of cancer based on history or current findings.

CT for Management of Hemoptysis[29, 30] – High-resolution CT (HRCT) is useful for estimating the severity of hemoptysis, localizing the bleeding site and determining the cause of the bleeding. Its results can be related to the severity of bleeding. The volume of expectorated blood and the amount of blood that may be retained within the lungs without being coughed up are important. HRCT is a way to evaluate the amount of bleeding and its severity. It may also help in the localization of bleeding sites and help in detecting the cause of bleeding.

CT and Solitary Pulmonary Nodules – Solitary Pulmonary nodules are abnormalities that are solid, semisolid and non-solid; another term to describe a nodule is focal opacity. CT makes it possible to find smaller nodules and contrast-enhanced CT is used to differentiate benign from malignant pulmonary modules. When a nodule is increasing in size or has spiculated margins or mixed solid and ground-glass attenuation, malignancy should be expected. Patients who have pulmonary nodules and who are immunocompromised may be subject to inflammatory processes.

CT and Empyema – Contrast-enhanced CT used in the evaluation of the chest wall may detect pleural effusion and differentiate a peripheral pulmonary abscess from a thoracic empyema. CT may also detect pleural space infections and help in the diagnosis and staging of thoracic empyema.

CT and Rib fractures[38] – Chest CT may be useful for characterizing a pathologic fracture, and some features may be helpful in differentiating a primary malignant tumor of bone from metastasis. CT may also be helpful to search for a primary malignancy in patients with a suspected pathologic fracture; however, there is no strong indication that CT serves a significant use as the initial imaging modality to detect pathologic rib fractures.

CT and Occupational Lung Disease[14] – The chest radiograph and CT are complementary in the initial workup of suspected occupational lung disease. When patients with occupational exposures present with respiratory symptoms, chest radiography serves as the primary function of excluding alternative diagnoses, such as infectious pneumonia or pulmonary edema, with HRCT findings offering the best characterization of lung disease.

CT and Tuberculosis – "The chest radiograph is usually the first study performed in patients suspected of having TB. Although frontal and lateral radiographs are often performed in this setting, it has been shown that the lateral radiograph does not improve the detection of findings related to TB. In those with signs or symptoms of disease, the radiographic pattern of upper-lobe or superior-segment lower-lobe fibrocavitary disease in the appropriate clinical setting is sufficient to warrant respiratory isolation and sputum culture for definitive diagnosis. Using radiographs in combination with clinical evaluation results in a high sensitivity for the diagnosis but a relatively low specificity for both latent and active TB. In addition, radiographs may reveal ancillary findings of TB such as pleural effusion or spondylitis. For immunocompromised hosts, particularly those with a low CD4 count, computed tomography (CT) should be considered."[39] CT may be of value in the severely immunocompromised patient

with a normal or near-normal radiograph by revealing abnormal lymph nodes or subtle parenchymal disease. Finally, CT may also have a role in identifying patients with latent TB who will be at risk for reactivation disease.

CT and Superior Vena Cava (SVC) Syndrome – SVC is associated with cancer, e.g., lung, breast and mediastinal neoplasms. These malignant diseases cause invasion of the venous intima or an extrinsic mass effect. Adenocarcinoma of the lung is the most common cause of SVC. SVC is a clinical diagnosis with typical symptoms of shortness of breath along with facial and upper extremity edema. Computed tomography (CT), often the most readily available technology, may be used as confirmation and may provide information including possible causes.

CT and Family History of Lung Cancer[40] – Family history is equally important. Individuals with a family history of lung cancer among first-degree relatives have been consistently shown to have a two-fold higher risk of developing lung cancer themselves. Those with multiple affected family members diagnosed at younger age appear to be at greater risk.

CT and COVID-19 – Chest CT is not recommended by the American College of Radiology either as a screening test for COVID-19 or as a first-line test to diagnose COVID-19.[41] The chest imaging pattern is nonspecific to COVID-19 and may be dependent on radiographic interpretation.[42-48] The CDC differentiates long COVID—also known as long-haul COVID, post-acute COVID-19, long-term effects of COVID, or chronic COVID—as post-COVID conditions that "are a wide range of new, returning, or ongoing health problems people can experience four or more weeks after first being infected with the virus that causes COVID-19. Even people who did not have COVID-19 symptoms in the days or weeks after they were infected can have post-COVID conditions. These conditions can present as different types and combinations of health problems for different lengths of time."[49]

POLICY HISTORY

Date	Summary
March 2022	• Clarified that no time delay required between chest x-ray and subsequent Chest CT for indeterminate incidental pulmonary nodules on chest x-ray (not typical of granulomatous disease) • Moved "Pre-operative evaluation for Electromagnetic Navigation Bronchoscopy" from Post-operative/procedural evaluation to Pre-operative/procedural evaluation • Added known fibrosis with continued symptoms to Long (Chronic) COVID
April 2021	• Added details for the following: incidental lung nodules as per the Fleischner Society; when not to use the Fleischner criteria; ordering of a Chest CT in the setting of coronavirus infection • Clarified when to use Lung Rads versus Fleischner criteria • Clarified pre-operative evaluation for a planned surgery or procedure • Added indications on what to image in setting of Covid 19

March 10, 2021	• Eliminated groupings (group 1 and group 2) for lung cancer screening and changed age of 55-80 years to 50-80 years; removed 30 pack year history of cigarette smoking (USPSTF 2021)
November 9, 2020	• Replaced CPT code G0297 with 71271

May 2020	• For Annual Lung Cancer Screening:
	  o Changed upper age limit from 77 to 80 yrs old
	  o Added:
	    • *Age ≥ 50 years old; AND*
	    • *≥ 20 pack-year history of smoking; AND*
	    • *Additional risk factors (other than second-hand smoke)* (see pg 2)*
	*Additional risk factors include: Survivors of lung cancer, lymphoma, cancers of the head and neck and bladder (smoking related cancers), first degree family members with a history of lung cancer, history of COPD or pulmonary fibrosis, radon exposure, retinoblastoma, Li Fraumeni syndrome, occupational exposure to arsenic, chromium, asbestos, nickel, cadmium, beryllium, silica, diesel fumes, coal smoke and soot
	• Expanded lung nodules section to include:
	  o *Incidental pulmonary nodules detected on CT (use Fleischner Table)*
	    • *Age ≥ 35 years old – use Fleischner table*
	    • *Excludes lung cancer screening, patients with history of primary cancer, or immunosuppression (see specific section in current guideline)*
	  o *Incidental pulmonary nodules on non-chest CT:*
	    • *Nodules >8mm or those with very suspicious features need further Chest CT as early as possible*
	    • Nodules ≤ 8mm should follow the Fleischner table
	• For Known Cancer, added: *For follow-up intervals for malignancies*
	• For Lung or Chest Wall Mass:
	  o Added statement: *Preference should be given to MRI over chest CT for chest wall mass*
	    • Removed descriptive variables for 'Mass with increased risk for malignancy' including: *Fixation to adjacent tissues; Firm consistency; Size > 1.5 cm; Ulceration of overlying skin*
	• Expanded Interstitial Lung Disease section to include:
	  o *Suspected or known based on restrictive pattern pulmonary function test or signs or symptoms after* initial chest x-ray
	  o *Signs or symptoms unresponsive to treatment such as:*
	    ▪ *Shortness of breath*
	    ▪ *Persistent dyspnea*

	■ *Persistent cough* ○ *Patients with known collagen vascular disease* ○ *Guidance in selection of the most appropriate site for biopsy of diffuse lung disease* - Infection f/u imaging: added *inflammatory disease* - Vocal Cord Paralysis on Endoscopic Exam: added '*Neck and Chest CT is an approvable combo*' - Removed Vascular Disease section and added the following: ○ CT chest is not preferred study for vascular disease, CTA should be considered. See Chest CTA guideline. ○ Chest CT can be used to detect and follow-up thoracic aortic aneurysms. - Added indication: Chest Wall Pain ○ *Chest Wall Pain (after initial evaluation with chest x-ray and/or rib films)* ■ *History of known or suspected cancer* ■ *Signs and symptoms of infection, such as:* ● *Accompanying fever* ● *Elevated inflammatory markers* ● *Known infection at other sites* - Added Neck and Chest CT combo study
May 2019	- Added chart for f/u interval at which LDCT can be approved - Removed pulmonary embolism indication - Added statement about CPT codes - Separate diagnostic criteria for Thoracic aneurysm - Separated individual diagnoses. - Expanded criteria for chronic cough. - Updated references.

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Reviewed / Approved by NIA Clinical Guideline Committee

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.