AmeriHealth Caritas Louisiana

National Imaging Associates, Inc.*	
Clinical guidelines CHEST (Thorax) CT	Original Date: September 1997
CPT Codes: 71250, 71260, 71270, G0297	Last Revised Date: May 2020
Guideline Number: NIA_CG_020	Implementation Date: ~~January 2021~~ TBD

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. All prior relevant imaging results, and the reason that alternative imaging (gold standard, protocol, contrast, etc.) cannot be performed must be included in the documentation submitted.

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 (G0297). 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:

Group 1:

- **Individual is between 55-80 years of age; AND**
- **There is at least a 30 pack-year history of cigarette smoking; AND**
- **If the individual is a former smoker, that individual had quit smoking within the previous 15 years.**

Group 2:

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- **Age ≥ 50 years old; AND**
- **≥ 20 pack-year history of smoking; AND**
- **Additional risk factors (other than second-hand smoke)***

***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**.

- ~~Individual is between 55-77 years of age; AND~~
- ~~There is at least a 30 pack-year history of cigarette smoking; AND~~
- ~~If the individual is a former smoker, the individual quit smoking within the previous 15 years (Mazzone, 2018)~~

Nodule on Initial LDCT:
(Wood, 2018)
- If multiple nodules, the largest and type is used for decision

~~*See table in Background section for follow-up interval at which LDCT can be approved to reduce radiation dose (Yang, 2018)~~

~~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 (G0297). 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.~~

Lung Nodules ~~LungLung Nodules: (?Incidental Pulmonary Nodules found of prior CXR or non-chest imaging)~~
(Bueno, 2018~~MacMahon, 2017~~)
- ~~Low Risk must include the following:~~
  - ~~Age < 35 years old; AND~~
  - ~~Non-smoker; AND Brain MRI approved 2/19/2020 with no indication that there is a CI to MRI.~~
  - ~~~~
- ~~No family history of lung cancer~~**Incidental pulmonary nodules detected on CT (use Fleischner Table)**

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- 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)

- 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

Table 1: 2017 Fleischner Society Guidelines for Management of Incidentally Detected Pulmonary Nodules

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)

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~~*See table in Background section~~

Known Cancer:

(Carter, 2018; Hong, 2014; Lee, 2014)

- **For follow-up intervals for malignancies** (**NCCN, 2019**)
- Cancer staging **(includes unknown primary)**
- Cancer restaging
- **Suspicious** ~~S~~signs or symptoms of recurrence
- **Suspected cancer based on prior imaging (Greco, 2012)**

Lung or Chest Wall Mass (Mullan, 2011):
~~:~~**(Preference should be given to MRI over chest CT for chest wall mass)**
~~(Mullan, 2011)~~
~~Mass or lesion, including lymphadenopathy, after non-diagnostic x-ray or ultrasound~~

- **Mass or lesion, including lymphadenopathy, after non-diagnostic initial imaging**
- ~~**Thymoma screening in** Mass with increased risk for malignancy (Pynnonen, 2017)~~
  - ~~Any of the following:~~
    - ~~Fixation to adjacent tissues~~
    - ~~Firm consistency~~
    - ~~Size > 1.5 cm~~
    - ~~Ulceration of overlying skin~~
- Myasthenia Gravis **patients**~~, Thymoma screening~~ (Kumar, 2015)

Interstitial Lung Disease:
(~~Nishino, 2014~~**ACR, 2019**; Vij, 2013)

- **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**
- ~~Initial diagnostic imaging after standard chest x-ray~~
- Monitoring treatment response **of known interstitial lung disease**
- ~~(if no change in symptoms, cxr may not be needed)~~**Patients with known collagen vascular disease (Antoniou, 2009)**
- **Guidance in selection of the most appropriate site for biopsy of diffuse lung disease (ACR, 2015)**

Chronic Cough (> 8 weeks) and chest x-ray completed (Turner, 2016):

- After evaluation for other causes and failed treatment for those diagnosed **with:**
  - Asthma

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- Gastroesophageal Reflux Disease
- Discontinuation of ACE inhibitors
- Post **n**~~N~~asal d~~D~~rip

- Clinical concern for ~~bronchiestasis~~**bronchiectasis**

Tuberculosis (TB): ~~Added section in overview CN~~
(Ko, 2018)

- Known or suspected tuberculosis and initial chest x-ray done

Infection Follow-up Imaging:

- Abscess, empyema, or pleural effusions on chest x-ray (Dean, 2016)
- 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 (Bryl, 2018; Little, 2014)

Pneumothorax on Chest X-ray (Melamed, 2017)

Vocal Cord Paralysis on Endoscopic Exam (Paquette, 2012)

- **Neck and Chest CT is an approvable combo**

Granulomatosis with Polyangiitis (Wegener's Granulomatosis) (Li, 2018)

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.**

- ~~Superior vena cava (SVC) syndrome (Friedman, 2017)~~
- ~~Clinical concern for Acute Aortic dissection (Barman, 2014)~~
  - ~~Sudden painful ripping sensation in the chest or back and may include:~~
    - ~~New diastolic murmur~~
      - ~~Cardiac tamponade~~
      - ~~Distant heart sounds~~
      - ~~Hypotension or shock~~
- ~~Initial evaluation of aneurysm (Erbel, 2014; Hannuksela, 2015; Hiratzka, 2010)~~
  - ~~Echocardiogram shows aneurysm~~
  - ~~Echocardiogram inconclusive of proximal aorta and first degree relative with thoracic aneurysm~~
  - ~~Chest x-ray shows aneurysm or tortuous aorta~~
- ~~Follow-up after established Thoracic Aneurysm (above these sizes surgery is usually recommended) (Erbel, 2014; Hannuksela 2015; Hiratzka, 2010)~~

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- ~~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~~

Suspected Pulmonary Embolism (PE):

- Chest CT not approvable for PE

Congenital Malformations

- Thoracic malformation on chest x-ray (Ferreira, 2015)
- Congenital Heart Disease with pulmonary hypertension (Pascall, 2018)

Hemoptysis after x-ray completed (**ACR, 2019;** Ketai, 2014)

Pre-operative evaluation

Post-operative/procedural evaluation:

- Post-surgical follow up when records document medical reason requiring additional imaging
-
-
- Pre-operative evaluation for Electromagnetic Navigation Bronchoscopy (Khan, 2016)
-

Chest Wall Pain (after initial evaluation with chest x-ray and/or rib films) (Winzenberg, 2015)

- **History of known or suspected cancer**
- **Signs and symptoms of infection, such as:**
  - **Accompanying fever**
  - **Elevated inflammatory markers**
  - **Known infection at other sites**

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.

~~*Fleischner Guidelines:~~

~~Nodule Type~~	~~<6mm~~	~~6-8 mm~~	~~>8mm~~
~~Single solid, low cancer risk~~	~~N/A~~	~~6,12,18,24~~	~~3mo, consider PET Scan, no specific end point~~
~~Single solid, not low cancer risk~~	~~12 mos~~	~~6,12,18,24~~	~~3mo, consider PET Scan, no specific end point~~
~~Multiple solid, low cancer risk~~	~~N/A~~	~~3,6,18,24~~	~~3,6,18,24~~
~~Multiple solid, not low cancer risk~~	~~12 mos~~	~~3,6,18,24~~	~~3,6,18,24~~
~~Single ground glass~~	~~N/A~~	~~6,12, q24 until 5 yrs~~	~~6,12, q24 until 5 yrs~~
~~Single part solid~~	~~N/A~~	~~3,6, q12 until 5 yrs~~	~~3,6, q12 until 5 yrs~~
~~Multiple ground glass or part solid~~	~~3,6,24,48~~	~~3,6, adjust based on most suspicious nodule~~	~~3,6, adjust based on most suspicious nodule~~

~~2017 Fleischner Society Guidelines for Management of Incidentally Detected Pulmonary Nodules~~

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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 (Erbel, 2014; Hannuksela, 2015; Hiratzka, 2010)**
  - **Echocardiogram shows aneurysm**

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    - 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) (Erbel, 2014; Hannuksela 2015; Hiratzka, 2010)
    - 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 (ACR, 2019) - 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 (Proulx, 2009) - 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 – 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

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may also detect pleural space infections and help in the diagnosis and staging of thoracic empyema.

CT and Rib fractures (ACR, 2018) --
CT 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 (ACR, 2019) --
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." 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 (Loverdos, 2019) -

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

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developing lung cancer themselves. Those with multiple affected family members diagnosed at younger age appear to be at greater risk.
~~. 2019 Oct-Dec; 14(4): 226–238.~~
~~Lung nodules: A comprehensive review on current approach and management~~

POLICY HISTORY:
Review Date: May 2019
Review Summary:
- 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.

Review Date: May 2020
Review Summary:
- For Annual Lung Cancer Screening:
  - Changed upper age limit from 77 to 80 yrs old
  - 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:
  - *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)*
  - *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:

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- 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:
  - *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*
  - *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

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Reviewed / Approved by M. Atif Khalid MD M. Atif Khalid, M.D., Medical Director, Radiology

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