Evolent Clinical Guideline ~~020~~ 2018 for Chest ~~(Thorax)~~Computed Tomography (CT)

Guideline ~~or Policy~~ Number:	Applicable Codes	
Evolent_CG_ ~~020~~2018		
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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

~~Screening for Lung Cancer~~ ~~(2,3)~~

- ~~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~~

    ~~*May approve for individuals over the age limit if the individual is a candidate for and willing to undergo curative treatment upon diagnosis~~

    ~~** Only personal cigarette smoking history as above places an individual at high risk; secondhand smoke exposure and other forms of smoking (such as pipe, cigar, marijuana, vaping) do **NOT** factor into current recommendations for LDCT Screening.~~
- ~~Screening should be discontinued once a person develops a health problem that limits the willingness or ability to have curative intent treatment.~~ ~~(2,3)~~

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 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~~ 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~~Abscess, empyema, or pleural effusions on 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]

~~Interstitial~~ Diffuse Lung Disease (DLD)

- For evaluation of suspected D~~I~~LD (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 ~~ILD~~DLD
  - Annually **OR**~~**AND**~~
  - For clinical progression of disease

NOTE: Chest CT for evaluation of ~~ILD~~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]

- ~~For evaluation of suspected Granulomatosis with Polyangiitis (Wegener's Granulomatosis) after initial workup including labs and chest x-ray suggest the diagnosis~~
- ~~For follow up of lesions after treatment~~ [12]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~~is~~ 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

~~*Covid-19 (Coronavirus)* (15)~~

~~Known acute COVID **AND** worsening respiratory status **AND** indeterminate chest x-ray~~

~~Known long (chronic) COVID **AND** any of the following **EITHER** (15):~~

- ~~Restricted diffusion on Pulmonary Function Test **OR**~~
- ~~Low oxygen saturation and prior Chest X-ray **OR**~~
- ~~Known fibrosis with persistent symptoms~~

~~s~~

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**:** ~~**EITHER**~~
  - Clinical concern for bronchiectasis ~~**OR**~~
  - 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:**~~ **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

~~*Suspected*~~ *Thoracic Aortic Aneurysm (TAA)*

- **Asymptomatic** known or suspected thoracic aortic aneurysm
  - With prior indeterminate or abnormal imaging (such as echocardiogram or chest x-ray)
  - ~~Based on other imaging such as echocardiogram or chest x-ray~~
  - ~~Screening in individuals with a personal history of bicuspid aortic valve when TTE (Transthoracic Echocardiogram) is inconclusive or insufficient [20]:~~
    - ~~Baseline study at diagnosis~~
    - ~~Every 3 years thereafter~~
  - ~~Screening in individuals at elevated risk due to family history as below when TTE (Transthoracic Echocardiogram) is inconclusive or insufficient [20]:~~
    - ~~First-degree relatives of individuals with a known thoracic aortic aneurysm (defined as > 50% above normal) or dissection~~
    - ~~First and second-degree relatives of individuals with familial thoracic aortic aneurysm and dissection (FTAAD)/nonsyndromic heritable thoracic aortic disease (NS-TAD)~~
    - ~~First degree relatives of individuals with a known bicuspid aortic valve~~
- **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)~~,~~

and bicuspid aortic valve) [20,22]

- Suspected vascular cause of dysphagia or expiratory wheezing with other imaging that is suggestive or inconclusive.

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:
  - Other Prior imaging (such as echocardiogram) is suggestive of AAS **OR**
  - Individual is either:
  - **High risk** patient for AAS and **one** sign/symptom concerning for AAS **OR** non-high risk and **two** or more signs/symptoms of 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~~post-EVAR~~ 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:
  - ~~Baseline f~~F~~ollow-up study a~~At ~~one year~~one-year post-repair~~operatively~~
  - 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)
- ~~Thoracic outlet syndrome~~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~~EITHER~~ [24]:
  - Suspicion of malignancy ~~**OR**~~
  - Signs and symptoms of infection, such as fever, elevated inflammatory markers, known infection at other sites ~~**OR**~~
  - 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

- ~~Non-lung Parenchymal [29]~~
  - ~~Mass or lesion, including lymphadenopathy, after inconclusive initial imaging:~~
    - ~~Can allow one follow-up to ensure stability~~

- ~~Additional follow-up may be approved if changing on repeat imaging~~

- ~~Chest Wall~~
  - ~~Mass or lesion after inconclusive initial imaging when MRI is contraindicated or cannot be performed~~
- 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 ≥ 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 ≥ 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°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 ~~31,32,33,34~~

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 **except** the following:~~
  - ~~Bladder cancer (non-muscle invasive)~~
  - ~~Breast cancer (stage I-III)~~
  - ~~Colon cancer (stage I)~~
  - ~~Prostate cancer (non-metastatic)~~
- ~~The above excluded malignancies would require initial evaluation (such as Chest x-ray) with findings concerning for chest pathology~~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~~s~~ 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~~only~~): 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 ~~and~~an additional 5 years, then as clinically indicated

- Colon Cancer~~(Stage II or higher)~~ [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 ~~10~~ 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 ~~2~~ 1year~~s~~, 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 ~~-6~~ months for ~~2 years~~1 year, then every 6-12 months for ~~an additional~~ 3 years, then as clinically indicated [61]
- Prostate Cancer ~~(observation)~~: as clinically indicated~~for rising PSA or symptoms suggestive of progression~~ [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
  - ~~Stage IV - every 3-6 months for 2 years, every 6-12 months for a total of 5 years~~
- 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 ~~5~~ 10 years ~~then as clinically indicated~~ [68]
- ~~Urothelial Carcinoma of the Prostate, Primary Carcinoma of the Urethra): high risk patients only: every 3-6 months for 2 years then annually~~
- Wilm's Tumor: every 3 months for 2 years then every 6 months for 2 years [69]
- ~~**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~~

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 ~~PROCEDURAL EVALUATION~~POSTOPERATIVE ASSESSMENT

When not otherwise specified in the guideline:

Preoperative evaluation: ~~for a planned surgery or procedure~~

- 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:~~Postoperative/procedural evaluation~~

- Known or suspected complications

- ~~Post-surgical follow-up when records document medical~~A clinical reason is provided how imaging may change management ~~requiring additional imaging~~

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

FURTHER EVALUATION OF INDETERMINATE FINDINGS ~~ON PRIOR IMAGING~~

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 ~~SYNDROMES AND RARE DISEASES~~

- 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~~when whole body MRI (CPT 76498) is not available~~ [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)
  - ~~Chest/Abdomen/Pelvis a~~Annually starting at age 8
  - ~~Brain/Chest/Abdomen/Pelvis~~ **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

~~Chest CT and Brain/Abdomen/Pelvis MRI~~

~~**Multiple Endocrine Neoplasia Syndrome Type 1 (MEN-1)** (guisti 2022)~~

~~**Chest/Abdomen/Pelvis annually**~~

~~**Brain/Chest/Abdomen/Pelvis every 3 years**~~**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 ~~invasion~~ involvement from tumor

Neck/Chest CT

- Vocal cord immobility~~paralysis~~ on endoscopic exam with~~and~~ 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~~disease~~

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

Codesing

CPT Codes

71250, 71260, 71270, 71271, +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

~~Fever of Unknown Origin~~

~~Initial work up prior to CT would include a comprehensive history, repeated physical exam, complete blood count with differential, three sets of blood cultures, chest x-ray, complete metabolic panel, urinalysis, ESR, ANA, RA, CMV IgM antibodies, virus detection in blood, heterophile antibody test, tuberculin test, and HIV antibody test.61 Lastly, with a negative CXR, only when initial workup and abdomen/pelvis CT/MR fail to identify the cause for fever can Chest CT be approved. If CXR suggests a malignancy and/or source of fever, then Chest CT would be approved.~~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 wight 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)	Comparison to prior chest CT;
		Part or all oflungs cannot be evaluated	Additional lung cancer screening CT imaging needed;
		Findings suggestive of an inflammatory or infectious process (see note 10)	1-3 month LDCT
1	**Negative** Estimated Population Prevalence: 39%	**No lung nodules OR**	12-month screening LDCT
		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 mm^3) mean diameter at baseline or new **AND** • Solid; smooth margins; and oval, lentiform, or triangular shape	
		Solid nodule: • < 6 mm (< 113 mm^3) at baseline **OR** • New < 4 mm (< 34 mm^3)	
		Part solid nodule: • < 6 mm total mean diameter (< 113 mm^3) at baseline	
		Non solid nodule (GGN): • < 30 mm (< 14,137 mm^3) at baseline, new, or growing **OR** • ≥ 30 mm (≥ 14,137 mm^3) 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	
3	**Probably Benign** - Based on imaging features or behavior Estimated Population Prevalence: 9%	**Solid nodule:** • ≥ 6 to < 8 mm (≥ 113 to < 268 mm^3) at baseline **OR** • New 4 mm to < 6 mm (34 to < 113 mm^3)	6-month LDCT
		Part solid nodule: • ≥ 6 mm total mean diameter (≥ 113 mm^3) with solid component < 6 mm (< 113 mm^3) at baseline **OR** • New < 6 mm total mean diameter (< 113 mm^3)	
		Non solid nodule (GGN): • ≥ 30 mm (≥ 14,137 mm^3) 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)	
4A	**Suspicious** Estimated Population Prevalence: 4%	**Solid nodule:** • ≥ 8 to < 15 mm (≥ 268 to < 1,767 mm^3) at baseline **OR** • Growing < 8 mm (< 268 mm^3) **OR** • New 6 to < 8 mm (113 to < 268 mm^3)	3-month LDCT; PET/CT may be considered if there is a ≥ 8 mm (≥ 268 mm^3) solid nodule or solid component
		Part solid nodule: • ≥ 6 mm total mean diameter (≥ 113 mm^3) with solid component ≥ 6 mm to < 8 mm (≥ 113 to < 268 mm^3) at baseline **OR** • New or growing < 4 mm (< 34 mm^3) 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	
4B	**Very Suspicious** Estimated Population Prevalence: 2%	**Airway nodule**, segmental or more proximal - stable or growing (see note 11)	Referral for further clinical evaluation
		Solid nodule: • ≥ 15 mm (≥ 1767 mm^3) at baseline **OR** • New or growing ≥ 8 mm (≥ 268 mm^3)	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)
		Part solid nodule: • Solid component ≥ 8 mm (≥ 268 mm^3) at baseline **OR** • New or growing ≥ 4 mm (≥ 34 mm^3) 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)	
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: <6 mm (<100 mm³)	Size: 6–8 mm (100–250 mm³)	Size: >8 mm (>250 mm³)	Comments
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: <6 mm (<100 mm³)	Size: ≥6 mm (≥100 mm³)	Comments
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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