*National Imaging Associates, Inc.	
Clinical guidelines **CHEST CTA**	**Original Date: September 1997**
CPT Codes: 71275	**Last Revised Date: April 2023**
Guideline Number: NIA_CG_022-1	**Implementation Date: January 2024**

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.*

INDICATIONS FOR CHEST CTA

Chest Computed Tomography Angiography (CTA) is ordered for evaluation of the intrathoracic blood vessels. Chest CT and Chest CTA should not be approved at the same time.

Suspected Pulmonary Embolism (PE)[1-5]

- High risk for PE based on shock or hypotension, OR a validated pre-test high probability score (such as Well's >6, Modified Geneva score >11 -see Background),(D dimer is NOT needed for hi risk; can approve hi risk even with normal D dimer)
- Intermediate and Low risk require elevated D dimer(see Background)[6] (**NOTE**: A normal D-dimer obviates the need for PE imaging in hemodynamically stable patients with a low or intermediate clinical likelihood of PE.)

Vascular Disease

- Superior vena cava (SVC) syndrome[7]
- Subclavian Steal Syndrome after positive or inconclusive ultrasound[8, 9]
- Thoracic Outlet Syndrome[10, 11]
- Takayasu's arteritis[12]
- Clinical concern for Acute Aortic dissection[13, 14]

- Sudden painful ripping sensation in the chest or back and may include
  - New diastolic murmur
  - Cardiac tamponade
  - Distant heart sounds
  - Hypotension or shock

Initial/Screening for Thoracic Aortic Disease[15-17]

- Echocardiogram or chest x-ray show aneurysm
- Initial study for a suspected aneurysm
- Screening of first-degree relatives of individuals with a known thoracic aortic aneurysm (defined as > 50% above normal) or known dissection
- Evaluation in patients with known or suspected connective tissue disease or genetic condition that predisposes to aortic aneurysm or dissection, such as Marfan's, Ehlers Danlos, get a one-time study or for Loeys-Dietz syndrome- allow imaging at diagnosis and then every two years, or more frequently if abnormalities are found (Imaging may include head, neck, chest, abdomen and pelvis)14, 20 (MRA preferred due to cumulative radiation risk)
- Screening of the thoracic aorta after a diagnosis of a bicuspid aortic valve (dilation of the ascending aorta may not be seen on echocardiogram)[18]
  - If normal, re-image every three to five years
- Screening of first-degree relatives of patients with a bicuspid aortic valve
- Turner's syndrome – Screen for coarctation or aneurysm of the thoracic aorta
  - If normal results, screen every 5-10 years
  - If abnormal, screen annually
- Suspected vascular cause of dysphagia or expiratory wheezing with other imaging is suggestive or inconclusive

Follow-up after established Thoracic Aortic Aneurysm (TAA)[15-17]

- Six months follow-up after initial finding of a dilated thoracic aorta, for assessment of rate of change
  - Aortic Root or Ascending Aorta (in cm)
    - 3.5 to 4.4 Annual
    - 4.5 to 5.5 or growth rate ≥ 0.5 cm/year - Every 6 months
  - Genetically mediated (Marfan syndrome, Aortic Root or Ascending Aorta) (in cm)
    - 3.5 to 4.4 Annual
    - 4.5 to 5.0 or growth rate ≥ 0.5 cm/year Every 6 months
    - Surgery generally recommended over 5.0 cm
  - Descending Aorta (in cm)[19]
    - 4.0 to 5.0 Annual
    - 5.0 to 6.0 Every 6 months
- Follow-up post medical treatment of aortic dissection:
  - Acute dissection: 1 month, 6 months, then annually

    - Chronic dissection: annually
- Follow-up TEVAR surveillance at 1 month, then I year post op and if stable, then annually
- Follow up open repair if no residual aortopathy within first post op year, then every 5 years (if have residual aortopathy or abnormal findings on surveillance, annual follow up in then needed)
- Re-evaluation of known ascending aortic dilation or history of aortic dissection with a change in clinical status or cardiac exam or when findings may alter management.

Congenital Malformations (Chest Magnetic Resonance Angiography preferred if pediatrics or repeat imaging)

- Thoracic malformation on other imaging (chest x-ray, echocardiogram, gastrointestinal study, or inconclusive CT)[20-23]
- Congenital heart disease with pulmonary hypertension[24] or vascular anomalies
- Pulmonary sequestration[25]

Pulmonary Hypertension based on other testing[26, 27]

- Echocardiogram
- Right heart catheterization

Atrial fibrillation with ablation planned[28]

Preoperative/procedural evaluation

- Pre-operative evaluation for a planned surgery or procedure
- Pre-transplant CT or CTA/MRA chest approvable for surgical planning (to evaluate for vascular anatomy, mediastinal pathology, malignancy screening etc.)

Post-operative/procedural evaluation

- Post-operative complications[29, 30]
- See above indications for TAA follow up

Chest CTA and Abdomen CTA, Abdomen/Pelvis CTA or Abdominal Arteries CTA

- Transcatheter Aortic Valve Replacement (TAVR)[14, 31]
- Acute aortic dissection
- Takayasu's arteritis[12]
- Post-operative complications[29, 30]
- To evaluate for an embolic source of lower extremity vascular disease (may also approved as a combination chest CTA and Abdominal Arteries CTA when LE runoff disease needs to be evaluated as well). Echocardiography is also often needed, since the

heart is the most commonly reported source of lower extremity emboli, accounting for 55 to 87 percent of events.[32]

Other Indications

Further evaluation of indeterminate findings on prior imaging (unless follow up is otherwise specified within the guideline):

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

BACKGROUND

Computed tomography angiography is a non-invasive imaging modality that may be used in the evaluation of thoracic vascular problems. Chest CTA (non-coronary) may be used to evaluate vascular conditions, e.g., pulmonary embolism, thoracic aneurysm, thoracic aortic dissection, aortic coarctation, or pulmonary vascular stenosis. The vascular structures as well as the surrounding anatomical structures are depicted by CTA.

Pulmonary embolism (PE) Methods utilizing clinical assessment to determine probability for PE include:

Wells Score[33]

▪ Clinical symptoms of DVT (leg swelling, pain with palpation)	3.0
▪ Other diagnosis less likely than pulmonary embolism	3.0
▪ Heart rate >100	1.5
▪ Immobilization (≥3 days) or surgery in the previous four weeks	1.5
▪ Previous DVT/PE	1.5
▪ Hemoptysis	1.0
▪ Malignancy	1.0
Probability	**Score**
Traditional clinical probability assessment (Wells criteria)	
High	>6.0
Moderate	2.0 to 6.0
Low	<2.0

Modified Geneva Score[34]

Modified Geneva score

	Variables	Points
Risk factors	Age >65 years	1
	Previous deep venous thrombosis or pulmonary embolism	3
	Surgery under general anesthesia or fracture of the lower limbs within one month	2
	Active malignancy (solid or hematologic; currently active or cured within the last year)	2
Symptoms	Unilateral lower-limb pain	3
	Hemoptysis	2
Signs	Heart rate 75 to 94 beats per minute	3
	≥95 beats per minute	5
	Pain on lower limb deep venous palpation and unilateral edema	4
		Total points
Pre-test probability assessment	Low	0 to 3
	Intermediate	4 to 10
	High	≥11

OVERVIEW

Coarctation of the Aorta – Coarctation of the aorta is a common vascular anomaly characterized by a constriction of the lumen of the aorta distal to the origin of the left subclavian artery near the insertion of the ligamentum arteriosum. The clinical sign of coarctation of the aorta is a disparity in the pulsations and blood pressures in the legs and arms. Chest CTA/MRA may be used to evaluate either suspected or known aortic coarctation and patients with significant coarctation should be treated surgically or interventionally. It may also assist in the identification of postoperative complications.

Central Venous Thrombosis – CTA/MRA is useful in the identification of venous thrombi. Venous thrombosis can be evaluated by gadolinium-enhanced 3D MRA as an alternative to CTA, which may not be clinically feasible due to allergy to iodine contrast media or renal insufficiency.

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POLICY HISTORY

Date	Summary
April 2023	• Simplified PE indications to high risk, no need for d dimer, all else requires d dimer (added Pretest probability tables and removed other details from background) • Clarified and updated follow up after repair of TAA • General Information moved to beginning of guideline with added statement on clinical indications not addressed in this guideline • Added statement regarding further evaluation of indeterminate findings on prior imaging
March 2022	• For Suspected Pulmonary Embolism, clarified 'intermediate or high risk' as determined by parameters detailed in Overview section and included hyperlink to Overview section

Reviewed / Approved by NIA Clinical Guideline Committee

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