AmeriHealth Caritas Louisiana

National Imaging Associates, Inc.*	
Clinical guidelines **CHEST CTA**	**Original Date: September 1997**
CPT Codes: 71275	**Last Revised Date: ~~April~~ March 2021~~1~~**
Guideline Number: NIA_CG_022-1	**Implementation Date: January 2023~~2~~**

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 ~~(ACCP, 2013; ACR, 2020; Corrigan, 2016; Kirsch, 2017; Konstantinides, 2014)~~

- ~~High r~~risk for PE based on shock or hypotension
- **Intermediate or high r**~~R~~isk ~~can~~ **as** ~~be~~ determined by the parameters detailed in ~~Background~~ **Overview section**
- Positive D-dimer[2, 4] ~~(Corrigan, 2016; Konstantinides, 2014)~~

Vascular Disease

- Superior vena cava (SVC) syndrome[6] ~~(Friedman, 2017)~~
- Subclavian Steal Syndrome after positive or inconclusive ultrasound[7, 8] ~~(Osiro, 2012; Potter, 2014)~~
- Thoracic Outlet Syndrome[9, 10] ~~(ACR, 2019; Povlsen, 2018)~~
- Takayasu's arteritis[11] ~~(Keser, 2014)~~
- Clinical concern for Acute Aortic dissection[12, 13] ~~(ACR, 2017; 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/Screening for Thoracic Aortic Disease[14-16]

~~(Erbel, 2014; Hannuksela, 2015; Hiratzka, 2010)~~

- Echocardiogram or chest x-ray show aneurysm

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- Initial study for a suspected aneurysm
- Screening of first-degree relatives of individuals with a thoracic aortic aneurysm (defined as > 50% above normal) or dissection

    - Known connective tissue disease or genetic conditions that predispose to aortic aneurysm or dissection (e.g., Marfan syndrome, Ehlers Danlos or Loeys-Dietz syndromes)
- Screening of the thoracic aorta after a diagnosis of a bicuspid aortic valve (dilation of the ascending aorta may not be seen on echocardiogram)[17] ~~(Borger, 2018)~~
    - 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 Aneurysm[14-16]
~~(Erbel, 2014; Hannuksela 2015; Hiratzka, 2010)~~

- 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 (Marfans 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)[18] ~~(Braverman, 2011)~~
        - 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 post either root repair or AVR plus ascending aortic root/arch repair: baseline post-op, then annually
- 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)[19-22] ~~(Ferreira, 2015; Hellinger, 2011; Karaosmanoglu, 2015; Poletto, 2017)~~
- Congenital heart disease with pulmonary hypertension[23] ~~(Pascall, 2018)~~ or vascular anomalies
- Pulmonary sequestration[24] ~~(Sancak, 2003)~~

Pulmonary Hypertension based on other testing[25, 26]
~~(Ascha, 2017; Rose-Jones, 2015)~~
- Echocardiogram
- Right heart catheterization

Atrial fibrillation with ablation planned[27]
~~(Kolandaivelu, 2012)~~

Preoperative/procedural evaluation
- Pre-operative evaluation for a planned surgery or procedure

Post-operative/procedural evaluation
- Post-operative complications[28, 29] ~~(Bennet, 2017; Choudhury, 2017)~~
- Routine post-operative[30, 31] ~~(Lawrence; 2018; Uthof, 2012)~~
    - Thoracic endovascular or open surgical aneurysm repair
        - 1 month
        - More frequent follow-up/possible intervention if complication detected
        - If stable, annual for 5 years

Chest CTA and Abdomen CTA or Abdomen/Pelvis CTA
- Transcatheter Aortic Valve Replacement (TAVR)13, 32 ~~(Achenbach, 2012; ACR, 2017)~~
- Acute aortic dissection12 ~~(Barman, 2014)~~
- Takayasu's arteritis[11] ~~(Keser, 2014)~~
- Post-operative complications[28, 29] ~~(Bennet, 2017; Choudhury, 2017)~~

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.

OVERVIEW
CTA and 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 may be used to evaluate either suspected or known aortic coarctation and patients with significant coarctation should be treated surgically or interventionally.

CTA and Pulmonary Embolism (PE) – **Note**: D-Dimer blood test in patients at low risk for DVT is indicated prior to CTA imaging. Negative D-Dimer suggests alternative diagnosis in these patients.

CTA has high sensitivity and specificity and is the primary imaging modality to evaluate patients suspected of having acute pulmonary embolism. When high suspicion of pulmonary embolism on clinical assessment is combined with a positive CTA, there is a strong indication of pulmonary embolism. Likewise, a low clinical suspicion and a negative CTA can be used to rule out pulmonary embolism.

Low risk is not approved. Low risk is defined as **NO** to **ALL** of the following questions with intermediate and high risk defined based on the number of positive responses[33] ~~(Konstantinides, 2020)~~:

- Evidence of current or prior DVT;
- HR > 100;
- Cancer diagnosis;
- Recent surgery or prolonged immobilization;
- Hemoptysis;
- History of PE;
- Oral hormone use;
- Another diagnosis beside PE is less likely

CTA and Thoracic Aortic Aneurysms – Computed tomographic angiography (CTA) allows the examination of the precise 3-D anatomy of the aneurysm from all angles and shows its relationship to branch vessels. This information is very important in determining the treatment: endovascular stent grafting or open surgical repair.

CTA and Thoracic Aorta Endovascular Stent-Grafts – CTA is an effective alternative to conventional angiography for postoperative follow-up of aortic stent grafts. It is used to review complications after thoracic endovascular aortic repair. CTA can detect luminal and extraluminal changes to the thoracic aorta after stent-grafting and can be performed efficiently with fast scanning speed and high spatial and temporal resolution.

POLICY HISTORY

Date	Summary
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 literature for updates.~~

April 2021	• Follow-up recommendations for bicuspid aortic valve. • Added suspected vascular cause of dysphagia or expiratory wheezing • Combined follow-up surveillance recommendations for endovascular and open ascending aorta repair as per literature review • Clarified pre-operative evaluation for a planned surgery or procedure

May 2020	• For Suspected Pulmonary Embolism, removed: 'Low Risk is not approved' section
	• Moved Vascular Disease content from Chest CT to Chest CTA, including:
	  ○ *Initial evaluation of aneurysm*
	  ▪ *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)*
	  ○ *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*
	• Thoracic Aortic Disease
	  ○ Organized into two sections:
	  ▪ Initial/Screening
	  ▪ Follow-up of known aneurysm/vascular pathology
	  ○ Removed: *'Annual follow up of enlarged thoracic aorta that is above top normal for age, gender, and body surface area'*

May 2019	• Expanded vascular indications including:
	  ○ Superior vena cava syndrome
	  ○ Takayasu's arteritis
	  ○ Subclavian steal syndrome after positive or inconclusive ultrasound
	• Expanded indications for congenital anomalies to include pulmonary sequestration

	• Updated thoracic aortic section to match cardiac guidelines

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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.~~

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ADDITIONAL RESOURCES

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