Cohere Medical Policy - Computed Tomography Angiography (CTA), Chest

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Guideline Information:

Specialty Area: Diagnostic Imaging
Guideline Name: Cohere Medical Policy - Computed Tomography Angiography (CTA), Chest

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Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

Table of Contents

Medical Necessity Criteria

Service: Computed Tomography Angiography (CTA), Chest

Recommended Clinical Approach

The referring clinician is responsible for indicating the appropriate clinical indication (e.g., Wells criteria for intermediate and high probability for pulmonary embolism) for computed tomography angiogram (CTA), CTA of the aorta, and computed tomography venography (CTV). The patient's pertinent history should justify the exam and select phase(s) of post-contrast imaging. The radiologist should protocol the examination before the patient arrives at the CT scanner.

Medical Necessity Criteria

Indications

- ➔ **Computed tomography angiography (CTA), chest** is considered appropriate if **ANY** of the following is **TRUE**[1-2]:
  - ◆ Trauma to the chest and vascular injury is suspected[3]; **OR**
  - ◆ Vascular conditions, known or suspected, including **ANY** of the following:
    - Aneurysm, known or suspected by prior imaging (ascending, transverse, or thoracic) for initial diagnosis
    - Aortic disease (non-traumatic) for initial diagnosis based on prior imaging or risk factors, surgical planning, or assessing treatment response or complications with **ANY** of the following[4,6-7]:
      - Congenital conditions (e.g., vascular anomaly); **OR**
      - Aortic rupture; **OR**
      - Dissection; **OR**
      - Mediastinal hematoma; **OR**
      - Intramural hematoma; **OR**
      - Penetrating atherosclerotic ulcer; **OR**
      - Pseudoaneurysm; **OR**
      - Infectious vasculitis (syphilis, mycotic aneurysm); **OR**
      - Inflammatory vasculitis; **OR**

        - Large-vessel vasculitis (e.g., Takayasu arteritis, giant cell arteritis, systemic lupus erythematosus)[5]; **OR**
        - Medium-vessel vasculitis (e.g., vasculitis affecting main visceral arteries)[5]; **OR**
        - Neoplastic; **OR**
    - Suspected arterial embolism that impacts **ANY** of the following[8]:
        - Upper or lower extremity; **OR**
        - Mesenteric system; **OR**
        - Renal arterial system; **OR**
    - Pulmonary arteriovenous malformation (PAVM), suspected, based on prior imaging or risk factors; **OR**
    - Pulmonary embolism (PE) as indicated by **ANY** of the following[7,9-11]:
        - Evaluation of PE in a pregnant patient; **OR**
        - High-risk with a validated Wells score greater than 6 (D-dimer is not needed); **OR**
        - PE likely based on modified Wells criteria (greater than 4 points); **OR**
        - PE suspected, based on modified Wells criteria (less than or equal to 4 points), with a positive D-dimer; **OR**
    - Pulmonary hypertension; **OR**
    - Chronic thromboembolic pulmonary hypertension**; OR**
    - Subclavian steal syndrome based on history, examination, or Doppler ultrasound[12]; **OR**
    - Subclavian artery stenosis[12]; **OR**
    - Systemic venous thrombosis or occlusion (includes superior vena cava [SVC] syndrome) based on clinical features or prior imaging; **OR**
    - Thoracic outlet syndrome based on clinical features or prior imaging; **OR**
- For evaluation of hemoptysis when chest radiograph or chest CT is inconclusive or requires further evaluation; **OR**
- Follow-up evaluation of known thoracic aortic aneurysm (TAA) in a patient <u>without</u> syndromic and non-syndromic hereditary thoracic aneurysm disease and **ANY** of the following:
    - Annual surveillance for aneurysm less than 5.0 cm; **OR**
    - Symptoms suggestive of aneurysmal growth/dissection[6]; **OR**

- 6-month evaluation for aneurysm for **ANY** of the following:
    - Greater than or equal to 5.0 cm; **OR**
    - Growing more than 0.5 cm/year; **OR**

◆ Follow-up evaluation of known TAA in a patient with syndromic and non-syndromic hereditary thoracic aneurysm disease defined as **ANY** of the following:
- Vascular Ehlers-Danlos syndrome; **OR**
- Loeys-Dietz syndrome; **OR**
- Marfan syndrome; **OR**
- Coarctation of the aorta; **OR**
- Tetralogy of Fallot, transposition of the great vessels, truncus arteriosus; **OR**
- Turner syndrome; **OR**
- Familial bicuspid aortic valve; **OR**
- Known predisposition as defined by the presence of genetic markers; **AND**
- Surveillance CTA at baseline, then follow up at 6-12 months, then every 6-24 months if stable)[13-14]: **OR**
- Symptoms suggestive of aneurysmal growth/dissection[6-7]; **OR**

◆ Ongoing monitoring for possible TAA in patients at high-risk but no prior documented TAA with **ANY** of the following:
- Loeys-Dietz syndrome monitoring annually if the patient is stable and low risk (less than 0.3 cm aneurysm growth/year) and less than 4.0 cm; **OR**
- Turner syndrome every 5 to 10 years; **OR**
- Bicuspid aortic valve every 2 years if TTE/TEE inconclusive; **OR**
- Marfan syndrome every 2 years; **OR**

◆ Initial screening CTA for a first-degree relative (parent, sibling, or child) of a patient with thoracic aortic disease with **ANY** of the following:
- Family history of Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehlers-Danlos; **OR**
- Family history of TAA due to **ANY** of the following:
    - ACTA2, MYH11, PRKG1, MYLK; **OR**
    - TAA without identified pathogenic variants in a known gene for HTAD; **OR**
    - TAA and bicuspid aortic valve; **OR**

        - Family history of intracranial or peripheral aneurysm; **OR**
        - Turner syndrome; **OR**
        - Coarctation of the aorta; **OR**
        - Congenital heart defects such as tetralogy of Fallot, transposition of the great vessels, truncus arteriosus; **OR**
- Transcatheter aortic valve replacement (TAVR) pre-intervention planning with an assessment of **ANY** of the following[17]:
    - Aortic root; **OR**
    - Supravalvular aorta and vascular access; **OR**
- Pulmonary vein mapping (e.g., prior to atrial fibrillation ablation); **OR**
- Thoracic endovascular repair (TEVAR) for the treatment of thoracic aortic disease and **ANY** of the following is **TRUE**[18-20]:
    - Pre-repair; **OR**
    - Post-repair; **OR**
- Post-treatment of acute aortic dissection at **ANY** of the following intervals:
    - 1 month; **OR**
    - 6 months; **OR**
    - Annually; **OR**
- Chronic dissection, annually; **OR**
    - Re-evaluation of known ascending aortic dilation or history of aortic dissection with a change in clinical status (including cardiac exam or other findings that may alter management); **OR**
    - Non-invasive clinical staging of a tumor to define vascular invasion; **OR**
- Congenital or acquired conditions as indicated by **ANY** of the following[21]:
    - Pulmonary sequestration; **OR**
    - Heart disease with **ANY** of the following:
        - Known single ventricle physiology and postoperative evaluation needed after stage 3 single ventricle palliation (total cavopulmonary connection); **OR**
        - Known or suspected anomalous pulmonary venous return; **OR**

        - Repaired tetralogy of Fallot or pulmonary valve stenosis with concern for pulmonary valve dysfunction or branch pulmonary artery stenosis; **OR**
        - Suspected aortic coarctation; **OR**
        - Transposition of the great arteries after arterial switch; **OR**
        - Transposition of the great arteries after atrial switch; **OR**
    - Repeat imaging of a specific area or structure using the same imaging modality (in the absence of an existing follow-up guideline) is considered appropriate when **ALL** of the following is **TRUE**:
        - There is documented clinical necessity; **AND**
        - Prior imaging results of the specific area or structure, obtained using the same imaging modality, must be documented and available for comparison; **AND**
        - **ANY** of the following is **TRUE**:
            - A change in clinical status, such as worsening symptoms or the emergence of new symptoms, that may influence the treatment approach; **OR**
            - The requirement for interval reassessment, which may alter the treatment plan; **OR**
            - One-time follow-up of a prior indeterminate finding to assess for interval change; **OR**
            - The need for re-imaging either before or after performing an invasive procedure.

Non-Indications

- ➔ **Computed tomography angiography (CTA), chest with contrast** is not considered if **ANY** of the following is **TRUE**[22]:
    - The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms; **OR**
    - If contrast is used, history of anaphylactic allergic reaction to iodinated contrast media.

*NOTE: The referring professional and radiologist should discuss the risks and benefits of contrast media administration, including possible prophylaxis, in patients with chronic or worsening kidney disease or severe renal failure.

**NOTE: CT in pregnant patients should be requested at the discretion of the ordering provider and obstetric care provider.
***NOTE: CT in patients with claustrophobia should be requested at the discretion of the ordering provider.

Disclaimer on Radiation Exposure in Pediatric Population

Due to the heightened sensitivity of pediatric patients to ionizing radiation, minimizing exposure is paramount. At Cohere, we are dedicated to ensuring that every patient, including the pediatric population, has access to appropriate imaging following accepted guidelines. Radiation risk is dependent mainly on the patient's age at exposure, the organs exposed, and the patient's sex, though there are other variables. The following technical guidelines are provided to ensure safe and effective imaging practices:

Radiation Dose Optimization: Adhere to the lowest effective dose principle for pediatric imaging. Ensure that imaging protocols are specifically tailored for pediatric patients to limit radiation exposure.[23-24]

Alternative Modalities: Prioritize non-ionizing imaging options such as ultrasound or MRI when clinically feasible, as they are less likely to expose the patient to ionizing radiation. For instance, MRI or ultrasound should be considered if they are more likely to provide an accurate diagnosis than CT, fluoroscopy, or radiography.[23-24]

Cumulative Dose Monitoring: Implement systems to track cumulative radiation exposure in pediatric patients, particularly for those requiring multiple imaging studies. Regularly reassess the necessity of repeat imaging based on clinical evaluation.[23-24]

CT Imaging Considerations: When CT is deemed the best method for achieving a correct diagnosis, use the lowest possible radiation dose that still yields reliable diagnostic images.[23-24]

Cohere Imaging Gently Guideline

The purpose of this guideline is to act as a potential override when clinically indicated to adhere to Imaging Gently and Imaging Wisely guidelines and As Low As Reasonably Possible (ALARA) principles.

Level of Care Criteria

Inpatient and Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
71275	Computed tomographic angiography (CTA), chest; with contrast material(s), including non-contrast images, if performed, and image postprocessing

Medical Evidence

Ko et al. (2021) review the utilization of chest CT angiography (CTA) to diagnose acute aortic syndromes. To ensure optimal quality of images, the authors address technical parameters of chest CTA, including non-contrast imaging, timing of contrast-enhanced imaging, volume and type of contrast material used, kilovolt potential, tube-current modulation, and decisions regarding electrocardiographic-gating and ultra-fast imaging. Acute aortic syndromes, especially those involving the ascending aorta, carry high morbidity and mortality rates and encompass conditions such as classic aortic dissection, penetrating atherosclerotic ulcer, and acute intramural hematoma. Recognition of related entities like ulcerated plaque, ulcer-like projections, intramural blood pools, and mimics such as vasculitis and aortic thrombus is crucial to avoid interpretive errors.[25]

Carrabba et al. (2019) present the results of a clinical trial that evaluated the efficacy of CTA for diagnosing coronary artery disease (CAD) in patients with new-onset chest pain. The 208 patients included had an unknown CAD diagnosis. Approximately half of the participants received standard testing care and CTA as a secondary investigation (group A), while the other half underwent CTA as their initial investigation (group B). Patients with obstructive CAD (O-CAD) demonstrated greater than 50% stenosis in the principal branch. According to the CTA results, the rates of CAD in group A compared to group B were as follows (P=0.001): 31.1% versus 27.4% for normal or minimal CAD; 42.5% versus 63.7% for no O-CAD; and 26.4% versus 8.8% for O-CAD.[26]

Baliyan et al. (2018) report on acute aortic syndromes in an emergency setting. CTA is the preferred imaging modality as it can be performed quickly and identify variations in anatomy including coarctation. Incidental findings are often identified (89%) when performing chest CTA. An alternative is MRA when CTA cannot be performed due to allergy to renal dysfunction or iodinated contrast.[27]

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Clinical Guideline Revision History/Information

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