Cohere Medicare Advantage Policy - Computed Tomography Angiography (CTA), Upper Extremity

Clinical Policy for Medical Necessity Review

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Important Notices

Notices & Disclaimers:

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Other Notices:

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Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Cohere Medicare Advantage Policy - Computed Tomography Angiography (CTA), Upper Extremity
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

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Medical Necessity Criteria

Service: Computed Tomography Angiography, Upper Extremity

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.

- There are no applicable NCDs and/or LCDs for Computed Tomography Angiography (CTA), Upper Extremity

Description

Upper extremity computed tomography angiography (CTA) allows for the characterization of vascular morphology and pathology in the upper limbs. It supports the diagnosis of vascular disease and planning for and subsequent monitoring of treatment for such diseases. Similarly, computed tomography venography (CTV) allows for the characterization of venous anatomy and the identification of obstructions and other venous abnormalities.[1-4]

Medical Necessity Criteria

Indications

Computed tomography angiography (CTA), upper extremity is considered appropriate if **ANY** of the following is **TRUE**[1-4]:

- Neoplastic conditions (including masses or mass-like conditions) when the arterial blood supply needs to be evaluated (e.g., for treatment planning, treatment response, or prognostication); **OR**
- Neoplastic invasion of arteries or veins; **OR**
- Trauma-related conditions as indicated by **ANY** of the following[3]:
  - Expanding hematoma[4]; **OR**
  - Major blunt trauma and the patient is hemodynamically stable[5]; **OR**
  - Neurologic deficit of upper extremity in association with trauma; **OR**
  - Vascular trauma to upper extremity[6]; **OR**

    - Repetitive trauma syndromes with vascular complications (e.g., crutch injury, hypothenar hammer syndrome); **OR**
- Vascular conditions, known or suspected, including **ANY** of the following[4]:
    - Aneurysm, seen on ultrasound or where ultrasound is nondiagnostic; **OR**
    - Intramural hematoma; **OR**
    - Dissection; **OR**
    - Clinical suspicion of acute or chronic limb ischemia, when ultrasound is inconclusive or nondiagnostic, with **ANY** of the following:
        - Acute absence of radial or ulnar pulses; **OR**
        - Acute changes in motor or sensory function; **OR**
        - Symptoms with exercise attributable to vascular etiologies such as muscle pain that resolves with rest, coldness, pallor, or fatigue; **OR**
    - Determination of hemorrhage source (including nonsurgical, spontaneous)[4]; **OR**
    - Localization and characterization of vascular malformation or fistula (e.g., assessing treatment response, treatment planning) with **ANY** of the following:
        - Duplex ultrasound indeterminate or nondiagnostic; **OR**
        - High flow lesion suspected clinically or by imaging; **OR**
        - Preoperative planning; **OR**
    - Vasculitis, initial evaluation, when **ANY** of the following are **TRUE**[6]:
        - Biopsy proven; **OR**
        - Rheumatologic panel work-up including, but not limited to, erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), is suggestive of vasculitis; **OR**
        - Requesting clinician specializes in rheumatology and the outcome of the imaging is expected to change management and/or treatment plan; **OR**
    - Noninflammatory vasculopathy that is symptomatic, such as Raynaud's, Buerger's disease, fibromuscular dysplasia, or scleroderma[7]; **OR**
    - Arterial entrapment syndrome, when ultrasound is inconclusive or contraindicated[7]; **OR**
    - Pre- and postintervention evaluation, when ultrasound is inconclusive or nondiagnostic, and **ANY** of the following[8,9]:
        - Postoperative evaluation of the effectiveness of arterial or venous reconstruction or bypass; **OR**
        - Characterization of normal and variant vascular anatomy; **OR**

        - Determination of the patency, location, or integrity of grafts and other vascular devices (e.g., stents); **OR**
        - Planning autografts for musculoskeletal reconstruction; **OR**
        - Treatment of arterial entrapment syndrome; **OR**
    - Nonhealing upper extremity ulcers with abnormal or inconclusive ultrasound results (e.g., arterial Doppler); **OR**
    - Vascular steal syndrome of the upper extremity, is suspected, and initial imaging is needed to guide therapy[6]; **OR**
    - Hemodialysis access evaluation, if **ALL** of the following are **TRUE**[10]:
        - Duplex ultrasound is inconclusive; **AND**
        - Fistulogram cannot be performed; **AND**
        - Steal syndrome; **OR**
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
    - There are no established guidelines; **AND**
    - **ANY** of the following:
        - There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
        - There is need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
        - In the absence of change in symptoms, there is an established need for monitoring which would influence management.

Computed tomography venogram (CTV), upper extremity is considered appropriate if **ANY** of the following is **TRUE**[7-9]:

- Neoplastic conditions (including masses or mass-like conditions) when the arterial blood supply needs to be evaluated (e.g., for treatment planning, treatment-response, or prognostication); **OR**
- Neoplastic invasion of arteries or veins; **OR**
- Initial evaluation for known venous upper extremity ulcer, when ultrasound is indeterminate or nondiagnostic; **OR**
- Known or suspected acute or chronic deep venous thrombosis, when results would change management and ultrasound has been completed; **OR**
- Known severe postthrombotic changes incompletely evaluated by ultrasound[7]; **OR**

- Subclavian or central venous obstruction, such as subclavian vein thrombosis, Paget-Schroetter syndrome, or thoracic outlet syndrome, either known or suspected clinically (e.g., edema aggravated by exercise/arm position); **OR**
- Pre- and post-intervention evaluation when **ANY** of the following[8,9]:
  - Postoperative evaluation of the effectiveness of arterial or venous reconstruction or bypass; **OR**
  - Characterization of normal and variant vascular anatomy; **OR**
  - Determination of the patency, location, or integrity of grafts and other vascular devices (e.g., stents)[9]; **OR**
  - Planning autografts for musculoskeletal reconstruction; **OR**
- Repeat imaging (defined as a repeat request following recent imaging of the same anatomic region with the same or similar modality) will be considered reasonable and necessary if **ALL** of the following are **TRUE**:
  - There are no established guidelines; **AND**
  - **ANY** of the following:
    - There are new or worsening symptoms not addressed in the guidelines, such that repeat imaging would influence treatment; **OR**
    - There is a need for a one-time clarifying follow-up of a prior indeterminate finding; **OR**
    - In the absence of a change in symptoms, there is an established need for monitoring which would influence management.

Non-Indications

Computed tomography angiography (CTA), upper extremity is not considered appropriate if **ANY** of the following is **TRUE**[11]:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms[12].

*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 Populations

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.[13,14]

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.[13,14]

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.[13,14]

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.[13,14]

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 or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
73206	Computed tomographic angiography (CTA), upper extremity; with contrast material(s), including non-contrast images, if performed, and image postprocessing

Disclaimer: S Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

Evaluation of Clinical Harms and Benefits

Clinical determinations for Medicare Advantage beneficiaries are made in accordance with 42 CFR 422.101 guidance outlining CMS's required approach to decision hierarchy in the setting of NCDs/LCDs identified as being "not fully established". When clinical coverage criteria are "not fully established," Medicare Advantage organizations are instructed to create publicly accessible clinical coverage criteria based on widely accepted clinical guidelines and/or scientific studies backed by a robust clinical evidence base. Clinical coverage criteria provided by Cohere Health in this manner include coverage rationale and risk/benefit analysis.

The potential clinical harms of using these criteria for computed tomography angiography of the upper extremity may include:

- Suboptimal upper extremity imaging: CTA may not adequately characterize small vessel vasculitis, such as Raynaud syndrome[7], may not sufficiently delineate between acute vasculitis versus atherosclerosis in the absence of other diagnostic systemic symptoms[7], may be poor in examination of hand vasculature among patients with vasoconstriction caused by cold hands or tobacco/cannabis use prior to exam[8], and may be nondiagnostic/inconclusive if artifacts are present - including those caused by retained metal objects.[15]
- Nondiagnostic: Up to 8% of post-trauma extremity CTA is ultimately felt to be nondiagnostic.[16]

- Inherent risk of procedure: There are inherent risks of imaging, including cumulative radiation exposure, contrast, allergy, nephrotoxicity, and contrast extravasation into surrounding tissues.[12,13,18,19]
- Potential danger to pregnancy: CT imaging completed during pregnancy confers a dose of ionizing radiation to the fetus and is generally only utilized when the potential benefits of this specific imaging modality outweigh the risks to the pregnancy.[20] Fetal risk includes fetal demise, intrauterine growth restriction, microcephaly, delayed intellectual development, risk of childhood cancer, and fetal thyroid injury.[20]
- Increased healthcare costs and complications from the inappropriate use of additional interventions.[21]

The clinical benefits of using these criteria for computed tomography angiography of the upper extremity may include:

- Streamlined Care: In the setting of polytrauma and complex acute injury, CTA of the upper extremity can be performed as part of standard whole-body imaging and may improve the likelihood of limb salvage among patients with competing multisystem injuries.[15,16]
- Expedited Diagnosis: CTA represents an accurate, fast, reproducible imaging modality that improves time to hemorrhage control and limb reperfusion.[15,16]
- Optimal View: CTA is of particular use to visualize extravascular tissue versus other modalities, such as DSA (digital subtraction angiography).[7,22] CTA also optimally evaluates mycotic aneurysms, as gas within an aneurysm is a characteristic/diagnostic sign that is best seen on CTA.[7]

Medical Evidence

Ghouri et al. (2019) review the use of computed tomography (CT) and magnetic resonance angiography (MRA) of the upper extremity vasculature. While less frequent than lower extremity vascular abnormalities, upper extremity vascular issues require comprehensive assessment. Color Doppler is more convenient and bedside-accessible; however, it suffers from operator variability and lacks central vasculature evaluation. Computed tomography angiography (CTA) is the primary imaging tool and allows for optimal results. Contrast enhancement is pivotal in CTA imaging, with adjustments in acquisition methods, contrast injection rates, and patient characteristics (e.g., body mass index [BMI]) all impacting enhancing diagnostic accuracy. Advancements in CTA and MRA, including 3D reconstructions and time-resolved techniques, expand the ability to assess vascular pathologies previously reliant on conventional angiography.[2]

Nagpal et al. (2017) discuss the advancements in CT and magnetic resonance imaging (MRI) technology. This type of imaging allows for the assessment of upper extremity vascular conditions noninvasively. CT captures a wide field of view, and the widespread availability of CT makes it valuable in emergency scenarios and for patients with contraindications to gadolinium-based contrast agents. The capability of MRI provides dynamic imaging through techniques like time-resolved MRA, and its superior resolution for soft tissues positions it as the preferred choice for diagnosing vascular malformations, dynamic vascular compression disorders, and issues related to digital arteries. The technology of CT and MR ensures better anatomical and functional assessments for patients with upper extremity vascular symptoms.[22]

Dave and Fleischmann (2016) provide an overview of CTA of the upper extremities. While the value of CTA in trauma situations is widely acknowledged, its extensive and diverse clinical applications in subacute settings are equally significant. These include crucial roles in presurgical anatomical mapping, such as identifying variant arterial structures, assessing connective tissue disorders, diagnosing vasculitis, managing overuse syndromes, evaluating arteriovenous fistulae/grafts, diagnosing vascular malformations, recognizing compression syndromes, and investigating perivascular pathology.[4]

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Policy Revision History/Information

Original Date: September 12, 2024		
Review History		
Version 2	09/11/2025	Annual review Added ultrasound indication. Rearranged bullets for improved usability and organization. No changes to procedure codes. Updated repeat imaging language. Reframed Harms and Benefits section. Added citations (#8,9,12).