



**Cohere Medicare Advantage Policy –  
Computed Tomography Angiography (CTA), Head**  
*Clinical Policy for Medical Necessity Review*

**Version: 2**

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# Important Notices

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## Policy Information:

**Specialty Area:** Diagnostic Imaging

**Policy Name:** Cohere Medicare Advantage Policy - Computed Tomography Angiography (CTA), Head

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

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# Medical Necessity Criteria

**Service: Computed Tomography Angiography (CTA), Head**

## 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), Head.

## Description

Computed tomography (CT) angiography (CTA) of the head is an established and valuable procedure for identifying and characterizing vascular conditions and anatomy necessary for addressing extravascular disorders. CTA may be used as the primary method for detecting disease, as a supplementary tool for characterizing a known disease, or to evaluate changes over time.<sup>1</sup>

## Medical Necessity Criteria

### Indications

**Computed tomography angiography (CTA), head** is considered appropriate if **ANY** of the following is **TRUE**<sup>1,2</sup>:

- Neoplastic conditions, including surgical and radiation therapy localization, planning, and neuronavigation to delineate the vascular anatomy (e.g., tumor is in the vicinity or encases a major artery or occludes a major vein)<sup>1</sup>; **OR**
- Trauma-related conditions as indicated by **ANY** of the following<sup>1,2</sup>:
  - Head trauma with suspected intracranial arterial injury due to clinical risk factors or positive findings on prior imaging<sup>1</sup>; **OR**
  - Blunt cerebrovascular injury (BCVI) is suspected based on the mechanism and location of trauma (CTA of the neck is also indicated with CTA of the head)<sup>2</sup>; **OR**

- Traumatic vascular injuries<sup>1</sup>; **OR**
- Suspected carotid or vertebral artery dissection secondary to trauma; **OR**
- Vascular conditions, known or suspected, including **ANY** of the following:
  - Aneurysm with **ANY** of the following<sup>3-8</sup>:
    - Screening for cerebral artery aneurysm when **ANY** of the following is **TRUE**<sup>9-17</sup>:
      - Autosomal dominant polycystic kidney disease (adults); **OR**
      - The patient has two or more first-degree relatives (parent, brother, sister, or child) with a history of intracranial aneurysm; **OR**
      - The patient is symptomatic with one first-degree relative who has a history of intracranial aneurysm<sup>3-5,18</sup>; **OR**
      - Fibromuscular dysplasia; **OR**
      - Loeys-Dietz syndrome; **OR**
      - Spontaneous coronary arteries dissection (SCAD); **OR**
      - Known aortic coarctation (after age 10); **OR**
    - **ANY** of the following:
      - Diagnosis of intracranial hemorrhage; **OR**
      - Diagnosis of subarachnoid hemorrhage; **OR**
      - Intracerebral hemorrhage, known or suspected<sup>19</sup>; **OR**
      - The patient has a history of subarachnoid hemorrhage(s)<sup>4</sup>; **OR**
  - Cervical bruit or thrill with suspicion of neck carotid stenosis; **OR**
  - Headache with **ANY** of the following:
    - Acute onset worst/thunderclap headache<sup>20</sup>; **OR**
    - New onset or pattern during pregnancy or peripartum period; **OR**
    - Associated with exercise, exertion, Valsalva, or sexual activity; **OR**
  - Intracranial arterial dissection, suspected; **OR**
  - Intracranial occlusive disease (arterial or venous), suspected<sup>21</sup>; **OR**
  - Intracranial hypertension (idiopathic), suspected; **OR**
  - Pseudoaneurysm<sup>1</sup>; **OR**
  - Recent stroke, up to 6 months (remote history is not an indication unless recent transient ischemic attack (TIA) episodes have occurred)<sup>1</sup>; **OR**
  - Cranial neuropathy as indicated by **ANY** of the following and prior imaging is suspicious for a vascular pathology (e.g., aneurysm, arteriovenous fistulas [AVF])<sup>16-7</sup>:
    - Lower cranial nerve (CN) palsies, weakness or paralysis (CN IX-XII) (i.e., glossopharyngeal neuralgia); **OR**

- Unilateral isolated weakness or paralysis of the tongue (hypoglossal nerve, CN XII); **OR**
- Refractory trigeminal neuralgia when done for surgical planning; **OR**
- Isolated third nerve palsy (oculomotor) with pupil involvement to evaluate for aneurysm; **OR**
- Any combination or isolated involvement of cranial nerves where prior imaging is suspicious for vascular pathology; **OR**
- Acute or recent unexplained intracranial hemorrhage<sup>1</sup>; **OR**
- Atherosclerotic stenosis or occlusive disease, including suspected vasospasm or thromboembolism with **ANY** of the following<sup>1</sup>:
  - Patient has documented symptoms suggestive of stroke or TIA; **OR**
  - Based on prior imaging; **OR**
- Vasculopathy when **ALL** of the following are **TRUE**<sup>1</sup>:
  - Nonatherosclerotic; **AND**
  - Noninflammatory (e.g., radiation vasculopathy), **AND**
  - Suspected on prior imaging (e.g., CT, magnetic resonance imaging [MRI]); **OR**
- The patient has **ANY** of the following:
  - Abnormal neurologic signs; **OR**
  - Fever; **OR**
  - Visual disturbance; **OR**
  - Vertigo; **OR**
- Vascular malformation and fistula based on prior imaging<sup>1</sup>; **OR**
- Cerebrovascular disease in a patient age 18 or older, including **ANY** of the following<sup>8</sup>:
  - Acute subarachnoid hemorrhage (SAH), suspected or known on CT; **OR**
  - Central nervous system (CNS) vasculitis, suspected; **OR**
  - Cerebral aneurysm (treated or untreated), known; **OR**
  - Cerebral vasospasm, suspected; **OR**
  - High-flow vascular malformation (arteriovenous malformations [AVM]/arteriovenous fistula [AVF]), known; **OR**
  - Aneurysmal SAH in a younger patient who is at-risk of de novo aneurysm formation; **OR**
  - The patient has **ANY** of the following:
    - Moyamoya disease; **OR**
    - Bicuspid aortic valve; **OR**
    - Aortic aneurysm; **OR**

- Coarctation of the aorta; **OR**
- Cerebrovascular disease in a patient less than or equal to 17 years of age and **ANY** of the following is **TRUE**<sup>20</sup>:
  - Acute stroke is suspected with **ANY** of the following:
    - **ALL** of the following are **TRUE**:
      - Non-sickle cell related with new focal fixed or worsening neurologic deficit lasting less than 24 hours from last seen normal state; **AND**
      - There are no contraindications to emergent intervention; **OR**
    - Known or suspected arteriopathy or Moyamoya disease <sup>7,8</sup>; **OR**
    - Known or suspected central nervous system vasculitis; **OR**
    - Known or suspected low- or high-flow vascular anomaly; **OR**
    - The patient is not a candidate for emergent intervention; **OR**
  - Acute subarachnoid hemorrhage (SAH), suspected or known on CT; **OR**
  - Spontaneous cervicocranial arterial dissection based on clinical or imaging findings. (CTA head and neck ordered together); **OR**
  - Nontraumatic intracranial hemorrhage (hematoma) of unknown etiology found on CT or MRI and additional imaging study is needed; **OR**
  - Nontraumatic SAH detected by non-contrast CT; **OR**
- Vertebrobasilar insufficiency (VBI) as indicated by **ANY** of the following<sup>19-21</sup>:
  - Abnormal neurologic examination is consistent with central vertigo; **OR**
  - Associated with other brainstem neurologic deficits; **OR**
  - HINTS (Head Impulse-Nystagmus-Test of Skew) examination is consistent with central vertigo; **OR**
  - Neurological symptoms (central vertigo); **OR**
- For evaluation of **ANY** of the following miscellaneous pathologies when prior testing has failed:
  - Headache with an unrevealing MRI and **ANY** of the following is **TRUE**:
    - Persistent in nature; **OR**
    - Undifferentiated; **OR**
    - Unexplained; **OR**
  - Pulsatile tinnitus (unilateral or bilateral) as evidenced by **ANY** of the following<sup>1,22-23</sup>:
    - Localized to one ear (prior testing not required); **OR**

- Focal neurological abnormalities (consider MRI brain internal auditory canal [IAC] protocol first); **OR**
- Asymmetric hearing loss (consider MRI brain internal auditory canal [IAC] protocol first); **OR**
- Visual impairment including **ANY** of the following<sup>22</sup>:
  - Isolated third nerve palsy (oculomotor) with pupil involvement to evaluate for aneurysm; **OR**
  - Suspected venous thrombosis (e.g., dural sinus thrombosis) when MRV is contraindicated or cannot be performed; **OR**
- Preoperative assessment of vascular anatomy or pathology; **OR**
- Post-treatment follow-up to monitor treatment result and surveillance of vascular condition; **OR**
- Congenital conditions or anomalies including vascular abnormality associated with chronic anemic conditions (e.g., sickle cell disease) (MRA head is preferred in pediatric patients)<sup>24-25</sup>; **OR**

**Computed tomography venography (CTV), head** is indicated if **ANY** of the following is **TRUE**:

- Vascular conditions, known or suspected, including **ANY** of the following:
  - Venous/dural sinus abnormalities such as **ANY** of the following:
    - Acquired thrombosis/occlusion; **OR**
    - Venous sinus stenosis; **OR**
  - Large vein injury secondary to trauma; **OR**
  - Vascular invasion or displacement by tumor; **OR**
- Headache with **ANY** of the following:
  - New onset or pattern during pregnancy or peripartum period; **OR**
  - Headache with features of intracranial hypertension (e.g., papilledema, pulsatile tinnitus, visual symptoms worse on Valsalva)<sup>20</sup>; **OR**
- Initial diagnostic, one-time pre- or one-time post-treatment evaluation for treatment planning or evidence of clinical concern for vascular malformation.

**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.

## **Non-Indications**

**Computed tomography angiography (CTA) or computed tomography venography (CTV), head** is not considered appropriate if **ANY** of the following is **TRUE**<sup>26</sup>:

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

## **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.<sup>28-29</sup>

**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.<sup>28-29</sup>

**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.<sup>28-29</sup>

**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.<sup>28-29</sup>

### **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)**

<b>CPT/HCPCS Code</b>	<b>Code Description</b>
70496	Computed tomographic angiography (CTA), head; 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 (CTA), head, may include:

- Inherent risk of procedure: There are inherent risks of imaging, including cumulative radiation exposure, contrast, allergy, nephrotoxicity, and contrast extravasation into surrounding tissues.<sup>28,29-31</sup>
- 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.<sup>32</sup> Fetal risk includes fetal demise, intrauterine growth restriction, microcephaly, delayed intellectual development, risk of childhood cancer, and fetal thyroid injury.<sup>6</sup>
- Increased healthcare costs and complications from the inappropriate use of additional interventions.<sup>33</sup>

The clinical benefits of using these criteria for computed tomography angiography (CTA), head, may include:

- Accuracy: CTA of the head is effective in diagnosing acute ischemic stroke. A study assessing acute stroke imaging found that CTA compared to non-contrast CT, increased the diagnosis of acute ischemic stroke.<sup>34</sup>
- Patient outcomes: CTA has a low risk of allergic reaction and contrast-induced neuropathy; adverse patient outcomes are minor.<sup>35</sup>
- Early diagnosis: Improved resolution of CTA may lead to early diagnosis of vascular abnormalities.<sup>9</sup>
- Enhanced overall patient satisfaction and healthcare experience.

## Medical Evidence

Photon-counting detector computed tomography (PCD-CT) is currently available in clinical settings. Conventional CT provides images with higher spatial resolution, reduced image noise, and lower radiation doses than traditional CT. Diehn et al. (2024) conducted a comparative, prospective study aimed to assess the comparative image quality and influence on diagnostic confidence of head CTA images obtained through PCD-CT versus energy-integrating detector CT (EID-CT). They found that PCD-CT enhances image quality for head CTA scans compared to EID-CT, both with matched PCD and EID reconstructions, and to a greater degree when PCD-UHR reconstruction is paired with a convolutional neural network (CNN) denoising algorithm.<sup>37</sup>

Tu et al. (2022) conducted a retrospective review on the utilization of head and neck computed tomography angiography (CTA) in the emergency department (ED). Head and neck CTA in the ED has shown a disproportionate increase compared to other neuroimaging examinations. The study contrasted utilization and the frequency of communicating non-routine results across different patient chief concerns. The study identified the top 50 primary concerns leading to the most CTA examinations. A total of 17903 CTAs for 833 distinct chief concerns were included, which accounts for 2.5% of 708,145 ED visits. The rates of ordering and communication of non-standard results exhibit significant variability across different chief concerns. Approximately half of the non-standard communications made by radiologists pertain to acute indications. Understanding the trends in ordering head and neck CTA and communicating non-standard results can aid in refining patient selection and enhancing radiologist interactions in the ED.<sup>38</sup>

Schenk et al. (2021) report on a retrospective review of stroke in young adults. CTA head and neck diagnostic yield is discussed for anterior circulation ischemic stroke evaluation. The review included adults aged 18-50 who presented to the Mayo Clinic Rochester ED. Carotid dissection is a predominant cause of anterior circulation ischemic stroke, as evidenced by findings on CTA. Studies found that carotid webs were infrequent in the patients studied, while carotid atherosclerosis was relatively rare.

Understanding the presence of carotid webs and their potential to trigger recurrent strokes, the authors did not cite a significant disparity in the prevalence of carotid atherosclerosis between the symptomatic and asymptomatic sides. Clinicians can recognize high-risk morphological attributes of carotid plaque observed on CT angiography, even in cases with no discernible stenosis.<sup>39</sup>

Heit et al. (2016) conducted an 11-year single-center retrospective review to analyze the yield of digital subtraction angiography (DSA) in patients with subarachnoid hemorrhage. DSA reveals vascular abnormalities in 13% of patients who initially test negative for subarachnoid hemorrhage (SAH) on CTA. Upon subsequent DSA, aneurysms or pseudoaneurysms are found in 4% of cases. Utilization of DSA may be appropriate for all patients with SAH-negative CT scans. To aid the clinician, the type of SAH pattern observed with DSA may offer clues to the underlying cause of the hemorrhage.<sup>40</sup>

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# Policy Revision History/Information

Original Date: September 19, 2024		
Review History		
Version 1	09/19/2024	New policy.
Version 2	09/11/2025	Annual review.  No changes to medical necessity criteria or procedure codes.  Indications linked to references.  Rearranged bullets for improved usability and organization.  Updated standard DI non-indication language.  Expanded the Medical Evidence section to include a new technology; added the corresponding reference.