Cohere Medical Policy -
Magnetic Resonance Angiography (MRA), Head

Clinical Policy for Medical Necessity Review

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Important Notices

Notices & Disclaimers:

GUIDELINES ARE SOLELY FOR COHERE'S USE IN PERFORMING MEDICAL NECESSITY REVIEWS AND ARE NOT INTENDED TO INFORM OR ALTER CLINICAL DECISION-MAKING OF END USERS.

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Other Notices:

Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Cohere Medical Policy - Magnetic Resonance Angiography (MRA), Head
Type: [**X**] Adult (18+ yo) | [**X**] Pediatric (0-17 yo)

Table of Contents

Medical Necessity Criteria

Service: Magnetic Resonance Angiography (MRA), Head

Cohere Health takes an evidence-based approach to reviewing imaging and procedure requests, meaning that sufficient clinical information must be provided at the time of submission to determine medical necessity. Documentation must include a recent and detailed history, physical examination related to the onset or change in symptoms, relevant lab results, prior imaging, and details of previous treatments. Advanced imaging or procedures should be requested after a clinical evaluation by the treating provider, which may include a referral to a specialist.

- When a specific clinical indication is not explicitly addressed in the Cohere Health medical policy, medical necessity will be determined based on established clinical best practices, as supported by evidence-based literature, peer-reviewed sources, professional society guidelines, and state or national recommendations, unless otherwise directed by the health plan.
- Requests submitted without clinical documentation, or those that do not align with the provided clinical information—such as mismatched laterality, body part, or CPT code—may be denied for lack of medical necessity due to insufficient or inconsistent clinical information.
- Repeat diagnostic testing due to technical issues—such as patient motion, incomplete exams, or incorrect imaging sequences—may not be considered medically necessary, as it is the responsibility of the imaging center to deliver appropriate, high-quality studies as originally authorized. Similarly, repeat imaging requested at a different facility based solely on provider preference may not be approved for medical necessity.
- When there are multiple diagnostic or therapeutic procedures requested simultaneously or within the past three months, each will be reviewed independently. Clinical documentation must clearly justify all of the following:
    - The medical necessity of each individual request

    - Why prior imaging or procedures were inconclusive or why additional/follow-up studies are needed
    - How the results will impact patient management or treatment decisions
- Requests involving adjacent or contiguous body parts may be considered not medically necessary if the documentation demonstrates that the patient's primary symptoms can be adequately assessed with a single study or procedure.
- Cohere Health evaluates imaging exams based on medical necessity, regardless of contrast use. If an initial non-contrast study is completed and the radiologist later determines that contrast is needed to clarify a finding, the original authorization number may be used—provided the contrast-enhanced exam is performed at the same imaging center and within the original request's validity period, unless otherwise directed by the health plan.

Description

Imaging analysis utilizing magnetic resonance angiography (MRA) of the head can be performed alone or in conjunction with MRA of the neck. MRA plays a crucial role in the routine assessment of patients experiencing stroke syndrome, specifically for the evaluation of both cervical and intracranial vessels, enabling the identification and diagnosis of vascular anomalies. In conjunction with MRI, MRA enhances the examination by providing a comprehensive analysis of the cerebral parenchyma. MRA also serves as a viable alternative to CT angiography when using iodinated contrast material is not feasible.

Medical Necessity Criteria

Indications

Magnetic resonance angiography (MRA), head is considered appropriate if **ANY** of the following is **TRUE**[1,2]:

- Neoplastic conditions, including surgical and radiation therapy localization, planning, and neuronavigation to delineate the vascular anatomy (e.g., tumor is in the vicinity of or encases a major artery or occludes a major vein)[1]; **OR**
- Trauma-related conditions as indicated by **ANY** of the following:
  - Trauma of the head with a suspected intracranial arterial injury based on clinical findings or prior imaging[3]; **OR**
  - Traumatic injury to cervicocerebral vessels, suspected[4]; **OR**
  - Traumatic visual defect (including orbital injury)[5]; **OR**
- Vascular conditions, known or suspected, including **ANY** of the following:
  - Aneurysm with **ANY** of the following:
    - Screening for cerebral artery aneurysm when **ANY** of the following is **TRUE**[6-13]:
      - 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[14-17]; **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[18]; **OR**
      - The patient has a history of subarachnoid hemorrhages[19]; **OR**
  - Cervical bruit or thrill with suspicion of neck carotid stenosis; **OR**
  - Headache with **ANY** of the following:
    - Acute onset of worst headache of life/thunderclap headache[20]; **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[21] **OR**
- Intracranial hypertension (idiopathic), suspected; **OR**
- Cranial neuropathy, when **ALL** of the following are **TRUE**:
  - Prior imaging is suspicious for a vascular pathology (e.g., aneurysm, arteriovenous fistulas [AVF])[19,22,23]; **AND**
  - **ANY** of the following[22]:
    - Lower cranial nerve palsies, weakness or paralysis (cranial nerve [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**
- Vascular malformation of the brain or skull base, including **ANY** of the following occult cerebrovascular malformations:
  - Capillary telangiectasia; **OR**
  - Cavernous angioma; **OR**
  - Developmental venous anomaly; **OR**
- Vascular disease[21,24,25]; **OR**
- Vasculitis, suspected[26]; **OR**
- Cerebrovascular disease in a patient 18 years of age or older, including **ANY** of the following[26]:
  - Moyamoya disease; **OR**
  - Bicuspid aortic valve; **OR**
  - Aortic aneurysm; **OR**
  - Coarctation of the aorta; **OR**
- Signs/symptoms highly suggestive of leaking/ruptured internal carotid artery (ICA) or arteriovenous malformations (AVM) (e.g., blood in the cerebral spinal fluid, stiff neck, sudden explosive headache); **OR**
- Stroke/cerebrovascular accident (CVA); **OR**
- Transient ischemic attack (TIA)[27]; **OR**
- Vertebrobasilar insufficiency (VBI) as indicated by **ANY** of the following[28,29]:
  - Abnormal neurologic examination is consistent with central vertigo; **OR**

        - Associated with other brainstem neurologic deficits; **OR**
        - Head Impulse-Nystagmus-Test of Skew (HINTS)[A] examination is consistent with central vertigo; **OR**
        - Neurological symptoms (central vertigo); **OR**
- For evaluation of **ANY** of the following uncategorized/miscellaneous symptoms when applicable:
    - Massive epistaxis; **OR**
    - Neurological deficit(s) (focal or lateralizing); **OR**
    - Nontraumatic orbital asymmetry, exophthalmos, or enophthalmos[5]; **OR**
    - Ptosis (new-onset); **OR**
    - Pulsatile tinnitus (subjective or objective) for vascular etiology; **OR**
    - Visual loss (e.g., nonischemic)[5]; **OR**
    - Optic nerve symptoms[5]; **OR**
    - Chiasm symptoms (including pre or post chiasm)[5]; **OR**
    - Ophthalmoplegia[5]; **OR**
    - Diplopia[5]; **OR**
- Preoperative, postoperative, or pretreatment evaluation for **ANY** of the following:
    - Refractory trigeminal neuralgia when done for surgical planning; **OR**
    - Follow-up study for **ANY** of the following[24,25]:
        - Arteriovenous fistula (AVF); **OR**
        - Intracranial aneurysm; **OR**
    - Preoperative evaluation for **ANY** of the following[30]:
        - Carotid endarterectomy; **OR**
        - Percutaneous intervention; **OR**
    - Acute stroke, and performed in conjunction with neck MRA; **OR**
    - Follow-up for **ANY** of the following duplex (Doppler) scan findings:
        - Findings are indeterminate; **OR**
        - High carotid bifurcation; **OR**
        - High-grade stenosis in an asymptomatic patient; **OR**
        - Kinks; **OR**
        - Loops; **OR**
    - History of neck radiation therapy; **OR**
    - Delineation of the vascular supply of vascular neoplasm[31,32]; **OR**
    - Vascular malformation of brain or skull base; **OR**
    - Postprocedural evaluation following surgical or endovascular therapy (e.g., coiling)[6]; **OR**

    - Vascular anatomy to determine the effect of therapeutic interventions, as indicated by **ANY** of the following:
        - Aneurysm; **OR**
        - Arteriovenous malformation (AVM)[33]; **OR**
        - Dissection[34]; **OR**
        - Endovascular embolization; **OR**
        - Posttreatment changes for **ANY** of the following:
            - Surgical procedures (including interventional); **OR**
            - Radiation therapy; **OR**
        - Stent placement for treatment of stenosis; **OR**
        - Tumor embolization; **OR**
- Congenital conditions or anomalies including vascular abnormality associated with chronic anemic conditions (e.g., sickle cell disease) in pediatric patients[35,36]
- 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.

Magnetic resonance venography (MRV), head is considered appropriate if **ALL** of the following are **TRUE**:

- **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:
        - With new-onset or pattern during pregnancy or peripartum period; **OR**

        - Headache with features of intracranial hypertension (e.g., papilledema, pulsatile tinnitus, visual symptoms worse with Valsalva)[20]; **OR**
    - Initial diagnostic, one-time pre or one-time posttreatment evaluation for treatment planning or evidence of clinical concern for vascular malformation; **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.

Non-Indications

Magnetic resonance angiography (MRA) or magnetic resonance venography (MRV), head is not considered appropriate if **ANY** of the following is **TRUE**:

- The patient has undergone advanced imaging of the same body part within 3 months without undergoing treatment or developing new or worsening symptoms[37].

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

Definitions

[A]**HINTS**: Three bedside tests (Head Impulse, Nystagmus, Test of Skew) to assess whether acute vestibular symptoms (AVS, e.g., vertigo, nausea) are due to a central cause.
-The head impulse test measures the vestibulo-ocular reflex (VOR) by having the patient focus on a central target during rapid side-to-side head rotation. Inability to maintain fixation in one direction is considered abnormal.
-Nystagmus (i.e. rapid, involuntary eye movements). Nystagmus suggestive of a central cause of AVS includes vertical nystagmus, torsion nystagmus, or nystagmus that changes direction.
-Skew deviation (vertical misalignment of the eyes due to an imbalance of vestibular tone in the oculomotor system) is typically assessed by covering each eye in isolation, assessing for vertical correction of the eye position.

Level of Care Criteria

Inpatient or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
70544	Magnetic resonance angiography (MRA), head; without contrast material(s)
70545	Magnetic resonance angiography (MRA), head; with contrast material(s)
70546	Magnetic resonance angiography (MRA), head; without contrast material(s), followed by contrast material(s) and further sequences

Medical Evidence

Amin et al. (2023) present a scientific statement from the American Heart Association regarding the diagnosis, workup, and risk reduction of transient ischemic attack in the emergency department. Computed tomography angiography (CTA) demonstrates superior sensitivity and positive predictive value compared to magnetic resonance angiography (MRA) in detecting intracranial stenosis and occlusion. As a result, CTA is the recommended imaging modality over time-of-flight (without contrast) MRA. If there is a concern regarding administering iodinated contrast, expedited magnetic resonance imaging (MRI) with MRA is a viable alternative. Time-of-flight MRA may result in images of lower quality as there is a tendency to overestimate cervical carotid stenosis compared to gadolinium-enhanced MRA. However, this type of MRA may be suitable for screening purposes. Gadolinium-enhanced MRA of the neck is the preferred choice for patients who can safely receive gadolinium contrast.[38]

AbuRahma et al. (2022) review clinical guidelines for managing extracranial cerebrovascular disease published by the Society for Vascular Surgery. Contrast-enhanced MRA can produce three-dimensional images that rival those from a formal arteriography. A key advantage of MRA is less radiation exposure to the individual, and the use of iodinated-based contrast materials is not needed. Further, MRA allows for the integration of MRI of the brain, enabling the identification of clinically silent cerebral infarction. It also facilitates the assessment of plaque morphology, focusing on detecting intraplaque hemorrhage. The severity of carotid stenosis is more identifiable with MRA than CTA. While MRA excels in various aspects, it is unsuitable for screening carotid artery disease due to its substantial cost.[39]

Cummins et al. (2022) discuss the role of TOF MRA for pulsatile tinnitus (PT) and the identification of vascular causes of PT, including dural arteriovenous fistulas (DAVFs). The annual intracranial hemorrhage risk of DAVFs is over 24%. TOF-MRA is considered one of the most sensitive and specific noninvasive methods for diagnosing DAVF. The diagnosis of arterial aneurysms is aided by the use of TOF MRA, with a sensitivity greater than 90% and specificity over 80%. Stenoses are also detected by MRA (a sensitivity of 95.5% and specificity of 87.2%). When severe carotid artery stenosis is a cause of PT, the sensitivity

and specificity of TOF MRA is nearly 100%. Advantages of MRA include a greater pooled sensitivity for diagnosis than CT as well as excellent spatial resolution and is the most powerful sequence for DAVF diagnosis. In addition, MRA can diagnose intracranial and high cervical arterial etiologies (e.g., fibromuscular dysplasia, carotid stenosis, variant anatomy). Disadvantages include high cost, scanning time, and the dephasing of tortuous vessels.[6]

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Policy Revision History/Information

Original Date: March 18, 2022		
Review History		
Version 2	08/29/2024	Annual review and policy restructure
Version 3	10/30/2024	Edited repeat imaging criteria language.
Version 4	09/11/2025	Annual review. Added new HINTS definition. Added cranial neuropathy indication. Updated prior imaging requirements in indications. Updated content to align with revised template, including repeat imaging criteria.