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

Clinical Policy for Medical Necessity Review

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Important Notices

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Policy Information:

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

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Medical Necessity Criteria

Service: Magnetic Resonance Angiography (MRA), Chest

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

Magnetic resonance angiography (MRA) of the chest allows for visualizing blood vessels, including the arteries and veins. MRA evaluates vascular diseases, aortic pathologies, congenital heart conditions, venous pathologies, pulmonary artery diseases, and other pathologies (e.g., vasculitis, extrinsic compression). MRA does not involve radiation exposure, as compared to a computed tomography angiogram. MRA may be appropriate for patients with renal dysfunction, pregnancy, gadolinium-based contrast agent allergy, and children.[1]

Medical Necessity Criteria

Indications

Magnetic resonance angiography (MRA), chest is considered appropriate if **ANY** of the following is **TRUE** when computed tomography angiography (CTA) is contraindicated or cannot be performed:

- Non-traumatic thoracic arterial disease and **ALL** of the following[2,3]:
  - The patient requires **ANY** of the following:
    - Further imaging evaluation of suspected disease (based on history and physical exam or prior imaging); **OR**
    - Assessment of treatment response in known disease; **OR**
    - Evaluation of suspected complications in known disease; **AND**
  - **ANY** of the following[4,5]:
    - Congenital conditions (e.g., vascular anomaly)[6]; **OR**
    - Rupture; **OR**
    - Dissection[7,8]; **OR**
    - Mediastinal hematoma; **OR**
    - Intramural hematoma; **OR**
    - Penetrating atherosclerotic ulcer; **OR**
    - Pseudoaneurysm; **OR**
    - Non-aortic aneurysm; **OR**
    - Infectious vasculitis (syphilis, mycotic aneurysm)[9]; **OR**
    - Inflammatory vasculitis[9]; **OR**
    - Large-vessel vasculitis (giant-cell arteritis and Takayasu arteritis) suspected[9]; **OR**
    - Medium-vessel vasculitis (Polyarteritis nodosa [PAN] and Kawasaki disease) suspected[9]; **OR**
    - Neoplastic condition; **OR**
    - Vascular supply to, or involvement by, tumor; **OR**
- Suspected pulmonary arteriovenous malformation (PAVM) based on prior imaging or risk factors (e.g., hereditary hemorrhagic telangiectasia, genetic mutations, post-surgical, hepatopulmonary syndrome)
- Pulmonary embolism (PE) with **ALL** of the following:
  - CTA and/or ventilation/perfusion (V/Q) scan are contraindicated or cannot be performed[10-16]; **AND**
  - **ANY** of the following:
    - Evaluation of suspected PE in a pregnant patient; **OR**

        - High pretest probability of PE by Wells criteria (D-dimer not needed); **OR**
        - **ALL** of the following[17]:
            - Low or intermediate pretest probability of PE by Wells criteria; **AND**
            - Positive D-dimer; **OR**
- Suspected pulmonary hypertension, including chronic thromboembolic pulmonary hypertension (CTEPH)[18-20]; **OR**
- Evaluation of known CTEPH in a patient being considered for surgery[18-20]; **OR**
- Subclavian steal syndrome or suspected subclavian artery stenosis based on history, examination, or Doppler ultrasound[21]; **OR**
- Central thoracic venous thrombosis or occlusion (includes superior vena cava [SVC] syndrome) based on clinical features or prior imaging[22]; **OR**
- Clinical concern for subclavian venous thrombosis or occlusion with indeterminate findings on Doppler and further evaluation necessary; **OR**
- Vascular thoracic outlet syndrome suspected based on clinical features or prior imaging[23-28]; **OR**
- Evaluation of known or suspected thoracic aortic disease progression/complication based on signs, symptoms, or other imaging studies (e.g., chest pain, suspicion for rupture)[4,29]; **OR**
- Surveillance of known thoracic aortic aneurysm in a patient with non-syndromic/non-hereditary cause for **ANY** of the following[29]:
    - At baseline if the ascending aorta is not adequately imaged on transthoracic echocardiogram (TTE); **OR**
    - 6 months after the initial diagnosis; **OR**
    - Annual surveillance for thoracic aortic aneurysms less than 5 cm; **OR**
    - Surveillance every 6 months for thoracic aortic aneurysm greater than or equal to 5 cm; **OR**
    - Surveillance every 6 months for aneurysms that are growing by more than 0.5 cm/year; **OR**
- MRA indicated for surveillance of known syndromic/hereditary/genetic aortic disease for **ANY** of the following:
    - Marfan syndrome with **ANY** of the following[29]:
        - At baseline if the ascending aorta is not adequately imaged on TTE; **OR**
        - 6 months after baseline imaging; **OR**
        - Surveillance every 2 years if the patient does not have a thoracic aortic aneurysm; **OR**

    - Annual surveillance if aneurysm is growing by less than 0.3 cm/year; **OR**
    - Annual surveillance if aneurysm is less than 4.5 cm in size; **OR**
    - Surveillance every 6 months if aneurysm is growing by more than 0.3 cm/year; **OR**
    - Surveillance every 6 months if aneurysm is greater than 4.5 cm; **OR**
- Bicuspid aortic valve (BAV) with **ANY** of the following[29]:
    - At baseline if the ascending aorta is not adequately imaged on TTE; **OR**
    - 6 months after baseline imaging; **OR**
    - Surveillance every 2 years if the patient does not have a thoracic aortic aneurysm; **OR**
    - Annual surveillance if the aneurysm is growing by less than 0.3 cm/year; **OR**
    - Annual surveillance if the aneurysm is less than 4.5 cm in size; **OR**
    - Surveillance every 6 months if the aneurysm is growing by more than 0.3 cm/year; **OR**
    - Surveillance every 6 months if the aneurysm is greater than 4.5 cm; **OR**
- Turner Syndrome with **ANY** of the following[29]:
    - At baseline if the ascending aorta is not adequately imaged on TTE; **OR**
    - 6 months after baseline imaging; **OR**
    - Surveillance every 2 years if the patient does not have a thoracic aortic aneurysm; **OR**
    - Annual surveillance if the thoracic aortic aneurysm has an indexed diameter (aortic size index - ASI) greater than 2 cm/m^2; **OR**
- Loeys-Dietz syndrome with **ANY** of the following[29]; **OR**
    - At baseline if the ascending aorta is not adequately imaged on TTE; **OR**
    - 6 months after baseline imaging; **OR**
    - Annual surveillance if the aneurysm is less than 4.0 cm
    - Annual surveillance if the aneurysm is growing less than 0.3 cm growth/year; **OR**
    - Surveillance every 6 months if the aneurysm is greater than 4 cm; **OR**
    - Surveillance every 6 months if the aneurysm is growing by more than 0.3 cm/year; **OR**
- Vascular Ehlers-Danlos syndrome (VEDS) with **ANY** of the following[29]:

    - At baseline if the ascending aorta is not adequately imaged on TTE; **OR**
    - At 6 months after baseline imaging; **OR**
    - Annual surveillance if the aneurysm is less than 5.0 cm; **OR**
    - Annual surveillance if the aneurysm is growing less than 0.5 cm growth/year; **OR**
    - Surveillance every 6 months if the aneurysm is greater than 5 cm; **OR**
    - Surveillance every 6 months if the aneurysm is growing by more than 0.5 cm/year; **OR**
- Initial screening for a first-degree relative (parent, sibling, or child) of a patient with confirmed aortic disease attributable to a heritable or genetic cause[29]; **OR**
- Transcatheter aortic valve replacement (TAVR) preintervention planning with an assessment of **ANY** of the following[30]:
    - 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**[8,29,31]:
    - Prerepair; **OR**
    - Postrepair; **OR**
- Post-treatment (surgical or medical) of acute aortic dissection at **ANY** of the following intervals[8,29]:
    - 1 month post-treatment; **OR**
    - 6 months post-treatment; **OR**
    - If stable, annual surveillance starting 6 months after repair; **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**
- Congenital or acquired conditions as indicated by **ANY** of the following[32,33]:
    - Pulmonary sequestration[34]; **OR**
    - **ALL** of the following:
        - Inadequate TTE for assessment of cardiovascular morphology and function[32]; **AND**
        - **ANY** of the following:
            - Known single ventricle physiology[32]; **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[35]; **OR**
        - Aortic coarctation[36]; **OR**
        - Transposition of the great arteries after arterial switch; **OR**
        - Transposition of the great arteries after atrial switch; **OR**
- Noninvasive clinical staging of a tumor to define vascular invasion[37,38]; **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), chest may not be 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[39].

*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.

Level of Care Criteria

Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
71555	Magnetic resonance angiography (MRA), chest (excluding myocardium), with or without contrast material(s)
C8909	Magnetic resonance angiography (MRA) with contrast, chest (excluding myocardium)
C8910	Magnetic resonance angiography (MRA) without contrast, chest (excluding myocardium)
C8911	Magnetic resonance angiography (MRA) without contrast followed by with contrast, chest (excluding myocardium)

Medical Evidence

Londono et al. (2021) performed a retrospective review to evaluate the image quality of the entire thoracic aorta by comparing 3D radial respiratory self-navigated native magnetic resonance angiography (native-SN-MRA) based on a bSSFP sequence with traditional Cartesian 3D contrast-enhanced MRA (CE-MRA) that uses navigator-gated respiration control. Thirty-one aortic native-SN-MRA scans (average age 63.9 years) to 61 CE-MRA scans (average age 63.1 years) were used as a reference. The image quality was evaluated at the aortic root/ascending aorta, aortic arch, and descending aorta. For the 10 patients who underwent both MRA sequences, aortic pathologies were assessed, and both normal and pathological aortic diameters were measured. The study found that native-SN-MRA provides superior image quality for the entire thoracic aorta, especially in areas prone to motion artifacts, while also achieving shorter acquisition times compared to conventional techniques.[40]

Shimohira et al. (2015) present the results of a multicenter study on reperfusion rates of pulmonary arteriovenous malformations (PAVMs) following coil embolization. The study used time-resolved MRA or pulmonary angiography and included patients diagnosed with PAVM who underwent embolization. Sixteen patients in the study cohort underwent coil embolization (24 untreated or reperfused PAVMs). Among these, sac embolization was performed in 12 untreated PAVMs. Primary feeding artery embolization was performed in each of the 12 reperfused PAVMs. Additionally, five PAVMs required 2 to 4 treatments due to reperfusion. The overall study encompassed 32 coil embolizations. Reperfusion rates were examined at 3, 6, 12, and 24 months for both primary embolization (untreated PAVMs) and repeat embolization (reperfused PAVMs). The rates for primary embolization were 8%, 27%, 36%, and 49%, respectively, while for repeat embolization, they were 50%, 50%, 92%, and 100%, respectively. Upon assessment through time-resolved MRA or pulmonary angiography, reperfusion rates following coil embolization for PAVMs were notably elevated, especially in cases of repeat embolization.[41]

Poretti et al. (2015) reviewed using MRA to evaluate thoracic outlet syndrome (TOS). The protocol enables an independent review of veins and arteries by employing a single, simultaneous, and bilateral (SB-MRA) contrast injection,

applicable for both abduction and adduction acquisitions. Between 2009 and 2013, 38 MRA studies were conducted for individuals with clinically suspected TOS. The study cohort comprised 13 males and 25 females, with a mean age of 35.9 years (standard deviation equal to 11.13). Out of the total participants, 45% (17 patients) were diagnosed with predominant venous TOS (VTOS), 24% (nine patients) with predominant arterial TOS (ATOS), and 32% (12 patients) exhibited an indeterminate or nonvascular condition. Group A radiologists identified significantly more VTOS cases than Group B ($p = 0.049$). The interobserver agreement was exceptionally high. The employment of the simultaneous bilateral MRA (SB-MRA) protocol proves to be a secure and dependable method for investigating TOS. The protocol, offering an early acquisition phase allowing separate assessment of veins and arteries, enables the examination of collateral venous flow through a single contrast material injection and enhances diagnostic accuracy, particularly for VTOS. SB-MRA emerges as a valuable tool in diagnosing TOS of vascular origin.[27]

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Policy Revision History/Information

Original Date: March 18, 2022		
Review History		
Version 2	09/05/2024	Annual review and policy restructure.
Version 3	10/30/2024	Edited repeat imaging criteria language.
Version 4	09/11/2025	Annual review Rewrote indications to be parallel with CTA Chest policy, including expansion of criteria for congenital conditions, CTEPH, venous thrombosis, and aortic dissection, among others Removed trauma indication Updated content to align with revised template, including repeat imaging criteria Enhanced reference citations for clarity and comprehensiveness