Cohere Medicare Advantage Policy - Magnetic Resonance Angiography (MRA), Chest

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.

Cohere Health, Inc. ("**Cohere**") has published these clinical guidelines to determine the medical necessity of services (the "**Guidelines**") for informational purposes only, and solely for use by Cohere's authorized "**End Users**". These Guidelines (and any attachments or linked third-party content) are not intended to be a substitute for medical advice, diagnosis, or treatment directed by an appropriately licensed healthcare professional. These Guidelines are not in any way intended to support clinical decision-making of any kind; their sole purpose and intended use is to summarize certain criteria Cohere may use when reviewing the medical necessity of any service requests submitted to Cohere by End Users. Always seek the advice of a qualified healthcare professional regarding any medical questions, treatment decisions, or other clinical guidance. The Guidelines, including any attachments or linked content, are subject to change at any time without notice. This policy may be superseded by existing and applicable Centers for Medicare & Medicaid Services (CMS) statutes.

Other Notices:

Policy Information:

Specialty Area: Diagnostic Imaging
Policy Name: Cohere Medicare Advantage 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

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1-9]

- National Coverage Determination (NCD) 220.2. Magnetic Resonance Imaging
- Local Coverage Determination (LCD). Magnetic Resonance Angiography (MRA) (L33633)
  - Billing and Coding: Magnetic Resonance Angiography (MRA) (A56747)
- Local Coverage Determination (LCD). Magnetic Resonance Angiography (MRA) (L34372)
  - Billing and Coding: Magnetic Resonance Angiography (MRA) (A57779)
- Local Coverage Determination (LCD). Magnetic Resonance Angiography (MRA) (L34424)
  - Billing and Coding: Magnetic Resonance Angiography (MRA) (A56775)
- Local Coverage Determination (LCD). Magnetic Resonance Angiography (MRA) (L34865)
  - Billing and Coding: Magnetic Resonance Angiography (MRA) (A56805)

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.[10]

Medical Necessity Criteria

Indications

Magnetic resonance angiography (MRA), chest is considered appropriate if **ANY** of the following is **TRUE:**

- **ALL** of the following:
  - Computed tomography angiography (CTA) is contraindicated or cannot be performed; **AND**
  - The patient has **ANY** of the following:
    - Non-traumatic thoracic arterial disease and **ALL** of the following[11,12]:
      - 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[13,14]:
        - Congenital conditions (e.g., vascular anomaly)[15]; **OR**
        - Rupture; **OR**
        - Dissection[16,17]; **OR**
        - Mediastinal hematoma; **OR**
        - Intramural hematoma; **OR**
        - Penetrating atherosclerotic ulcer; **OR**
        - Pseudoaneurysm; **OR**
        - Non-aortic aneurysm; **OR**
        - Infectious vasculitis (syphilis, mycotic aneurysm)[18]; **OR**
        - Inflammatory vasculitis[18]; **OR**
        - Large-vessel vasculitis (giant-cell arteritis and Takayasu arteritis) suspected[18]; **OR**
        - Medium-vessel vasculitis (Polyarteritis nodosa [PAN] and Kawasaki disease) suspected[18]; **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); **OR**

- Pulmonary embolism (PE) when intravascular iodinated contrast material is contraindicated[1]; **OR**
- Suspected pulmonary hypertension, including chronic thromboembolic pulmonary hypertension (CTEPH)[27-29]; **OR**
- Evaluation of known CTEPH in a patient being considered for surgery[27-29]; **OR**
- Subclavian steal syndrome or suspected subclavian artery stenosis based on history, examination, or Doppler ultrasound[30]; **OR**
- Central thoracic venous thrombosis or occlusion (includes superior vena cava [SVC] syndrome) based on clinical features or prior imaging[31]; **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[32-37]; **OR**
- Diagnosis of aneurysm for pre-operative and post-operative evaluation of aortic dissection[1]; **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)[1,13,38]; **OR**
- Evaluation of known thoracic aortic aneurysm in a patient with non-syndromic/non-hereditary cause for **ANY** of the following[38]:
  - At baseline, if the ascending aorta is not adequately imaged on transthoracic echocardiogram (TTE); **OR**
  - 6 months after the initial diagnosis; **OR**
  - Annual evaluation for thoracic aortic aneurysms less than 5 cm; **OR**
  - Evaluation every 6 months for thoracic aortic aneurysm greater than or equal to 5 cm; **OR**
  - Evaluation every 6 months for aneurysms that are 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[38]; **OR**
- Transcatheter aortic valve replacement (TAVR) preintervention planning with an assessment of **ANY** of the following[39];
  - 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**[17,38,40]:
        - Prerepair; **OR**
        - Postrepair; **OR**
    - Post-treatment (surgical or medical) of acute aortic dissection at **ANY** of the following intervals[17,38]:
        - 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[41,42]:
        - Pulmonary sequestration[43]; **OR**
        - **ALL** of the following:
            - Inadequate TTE for assessment of cardiovascular morphology and function[41]; **AND**
            - **ANY** of the following:
                - Known single ventricle physiology[41]; **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[44]; **OR**
                - Aortic coarctation[45]; **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[46,47]; **OR**
- Surveillance of known syndromic/hereditary/genetic aortic disease for **ANY** of the following:
    - Marfan syndrome with **ANY** of the following[38]:
        - 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[38]:
        - 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[38]:
        - 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[38]; **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; **OR**
        - 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[38]:
        - 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 per 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 per year; **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.[48]

*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)

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 magnetic resonance angiography (MRA), chest may include:

- Adverse effects from delayed or denied treatment, such as adverse pulmonary embolism-related events (e.g., myocardial Infarction, stroke, unplanned coronary revascularization).[49,50]
- Increased healthcare costs and complications from the inappropriate use of additional interventions.[23]

The clinical benefits of using these criteria for MRA, chest may include:

- Improved patient selection, resulting in better long-term outcomes for patients with thoracic or vascular diseases.[51]
- Maintenance of rigorous patient safety standards aligned to best available evidence.[50]
- Appropriate allocation of healthcare resources at the individual beneficiary and population levels.

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. Aortic pathologies were assessed for the 10 patients who underwent both MRA sequences, 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.[52]

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.[53]

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.[36]

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Policy Revision History/Information

Original Date: October 29, 2024		
Review History		
Version 1.1	04/21/2025	Updated policy per CMS revisions for 03/27/2025. Updated Effective Date. Updated Links and References.
Version 2	10/23/2025	Annual review. Expanded indications for congenital conditions, CTEPH, venous thrombosis, aortic dissection, non-traumatic thoracic arterial disease, thoracic aortic aneurysm, aortic disease, bicuspid aortic valve, Turner syndrome, Loeys-Dietz syndrome, and Vascular Ehlers-Danlos syndrome. Removed trauma indication. Updated repeat imaging criteria. Edited Harms and Benefits section.