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

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Other Notices:

Guideline Information:

Specialty Area: Diagnostic Imaging
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Medical Necessity Criteria

Service: Magnetic Resonance Angiography (MRA), Chest

Benefit Category

Diagnostic Services in Outpatient Hospital
Diagnostic Tests (other)

Please Note: This may not be an exhaustive list of all applicable Medicare benefit categories for this item or service.[1]

Related CMS Documents

Please refer to the CMS Medicare Coverage Database for the most current applicable CMS National Coverage.[1-10]

- National Coverage Determination (NCD) 220.2. Magnetic Resonance Imaging
- Local Coverage Determination (LCD) L33633. Magnetic Resonance Angiography (MRA)
- Local Coverage Determination (LCD) L34372. Magnetic Resonance Angiography (MRA)
- Local Coverage Determination (LCD) L34424. Magnetic Resonance Angiography (MRA)
- Local Coverage Determination (LCD) L34865. Magnetic Resonance Angiography (MRA)
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- Billing and Coding: Independent Diagnostic Testing Facility (IDTF) (A57807)
- Billing and Coding: Magnetic Resonance Angiography (MRA) (A56747)
- Billing and Coding: Magnetic Resonance Angiography (MRA) (A56805)
- Billing and Coding: Magnetic Resonance Angiography (MRA) (A57779)

Recommended Clinical Approach

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). A computed tomography angiogram (CTA) can be performed faster than an MRA and uses different contrast materials. Radiation exposure occurs during a CTA, whereas MRA does not. Magnetic resonance venography (MRV) is a noninvasive technique used to evaluate the central venous system in the chest, and it can help diagnose and stage central venous obstruction.[11]

Evaluation of Clinical Harms and Benefits

Cohere Health uses the criteria below to ensure consistency in reviewing the conditions to be met for coverage of MRA of the chest. This process helps to prevent both incorrect denials and inappropriate approvals of medically necessary services. Specifically, limiting incorrect approvals reduces the risks associated with unnecessary procedures, such as complications from surgery, infections, and prolonged recovery times.

The potential clinical harms of using these criteria may include:

- There is a risk of malfunction of implanted medical devices (e.g., implanted pacemakers, cochlear implants).
- A potential exists for allergic reactions to contrast material if used in the study. The MRI department staff will monitor the patient for an allergic reaction and treat as recommended by a physician.[11-12]
- The use of gadolinium-based contrast is not recommended during pregnancy or in patients with acute or chronic kidney injury or disease.[11-12]
- If sedation is used for the study (for anxiety or claustrophobia), there is a risk of over-sedation. The patient will be monitored during the procedure to reduce this risk.
- There is an uncertain risk for MR imaging in pregnant patients. The decision to image a pregnant patient should be made on an individual basis in consultation with the patient's obstetric provider.[13]
- There is a risk of increased healthcare costs and complications from the inappropriate use of additional interventions.[14]

The clinical benefits of using these criteria include:

- MRA provides high-resolution imaging for a range of vascular territories and disorders.[15]
- The patient is not exposed to ionizing radiation or contrast agents.[15-16]
- MRA is useful during procedures such as stent placement to help guide physicians to visualize blood flow.
- Non-contrast MRA is safe for patients with renal impairment, pediatric patients, and pregnant patients.[16]
- MRA yields hemodynamic information regarding arterial flow and can aid in diagnosing aneurysms and narrowing or blockages of blood vessels. Functional information, like renal hemodynamics, is also provided by MRA.[16]
- Enhanced overall patient satisfaction and healthcare experience.

This policy includes provisions for expedited reviews and flexibility in urgent cases to mitigate risks of delayed access. Evidence-based criteria are employed to prevent inappropriate denials, ensuring that patients receive medically necessary care. The criteria aim to balance the need for effective treatment with the minimization of potential harms, providing numerous clinical benefits in helping avoid unnecessary complications from inappropriate care.

In addition, the use of these criteria is likely to decrease inappropriate denials by creating a consistent set of review criteria, thereby supporting optimal patient outcomes and efficient healthcare utilization.

Medical Necessity Criteria

Indications

- ➔ **Magnetic resonance angiography (MRA), chest** is considered appropriate if **ANY** of the following is **TRUE**:
  - ◆ Trauma (e.g., dissection, post-traumatic pseudoaneurysm); **OR**
  - ◆ Congenital or acquired conditions (e.g., pulmonary sequestration, heart disease)[17]; **OR**
  - ◆ Vascular conditions, known or suspected, including **ANY** of the following:

- Abnormality of the thoracic aorta (seen on prior imaging)[18]; **OR**
- Aneurysm or vascular malformation; **OR**
- Suspicion for acute aortic dissection in the presence of sudden, intense pain in the chest or back[1,19-20]; **OR**
- Pulmonary hypertension when CTA is contraindicated or cannot be performed[21]; **OR**
- Evaluation or diagnosis of pulmonary embolism if CTA or ventilation/perfusion (V/Q) scan is contraindicated or cannot be performed[1,22-28]; **OR**
- Superior vena cava (SVC) syndrome[29]; **OR**
- Subclavian steal syndrome following a positive or inconclusive ultrasound[30]; **OR**
- Takayasu's arteritis[31]; **OR**
- Thoracic outlet syndrome[32-37]; **OR**
- Vascular stenosis or occlusion due to atherosclerosis, vasculitis, or thromboembolic phenomena; **OR**
- Vascular supply to, or involvement by, tumor; **OR**
- Venous or arterial anatomy (e.g., congenital abnormalities, extrinsic compression, or causes of intrinsic stenosis or obstruction)[18,38-39]; **OR**

◆ Follow-up evaluation with an established thoracic aortic aneurysm (TAA) and **ANY** of the following is **TRUE**:

- Without syndromic and non-syndromic hereditary thoracic aneurysm disease and **ANY** of the following:
  - Annual surveillance for aneurysm less than 5.0 cm; **OR**
  - Symptoms suggestive of aneurysmal growth/dissection[40]; **OR**
  - 6-month evaluation for aneurysm for **ANY** of the following:
    - ◆ Greater than or equal to 5.0 cm; **OR**
    - ◆ Growing more than 0.5 cm per year; **OR**
- With syndromic and non-syndromic hereditary thoracic aneurysm disease (e.g., Ehlers-Danlos syndrome, Loeys-Dietz syndrome, Marfan syndrome, coarctation of the aorta) defined as **ANY** of the following:

    - Known predisposition as defined by the presence of genetic markers; **OR**
    - Surveillance MRA at baseline, then follow-up at 6 months, then annually if stable or more frequently if growth is noted)[41]; **OR**
    - Symptoms suggestive of aneurysmal growth/dissection[40,42]; **OR**

- **ANY** of the following:
  - Transcatheter aortic valve replacement (TAVR) pre-intervention planning with an assessment of **ANY** of the following[43]:
    - 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 (pre- or post-repair)[20,44-45]; **OR**
  - Chronic dissection, annually[1]; **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**
    - Non-invasive clinical staging of a tumor to define vascular invasion; **OR**
  - Post-treatment of acute aortic dissection (e.g., 1 month, 6 months, annually)[1]; **OR**
  - Ongoing monitoring for possible TAA in patients at high-risk (e.g., Loeys-Dietz syndrome, Turner syndrome, Marfan syndrome, bicuspid aortic valve); **OR**
  - Initial screening MRA for a first-degree relative (parent, sibling, or child) of a patient with thoracic aortic disease with **ANY** of the following:
    - Family history of Marfan syndrome, Loeys-Dietz syndrome, or vascular Ehlers-Danlos; **OR**
    - Family history of TAA due to **ANY** of the following:
      - ACTA2, MYH11, PRKG1, MYLK; **OR**
      - TAA without identified pathogenic variants in a known gene for HTAD; **OR**

- TAA and bicuspid aortic valve; **OR**
- Family history of intracranial or peripheral aneurysm; **OR**
- Turner syndrome; **OR**
- Coarctation of the aorta; **OR**
- Congenital heart defects such as tetralogy of Fallot, transposition of the great vessels, truncus arteriosus; **OR**

- Repeat imaging (defined as repeat request following recent imaging of the same anatomic region with the same modality), in the absence of established guidelines, will be considered reasonable and necessary if **ANY** of the following is **TRUE**:
  - New or worsening symptoms, such that repeat imaging would influence treatment; **OR**
  - 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**:
- If contrast is used, history of anaphylactic allergic reaction to gadolinium contrast media with detailed guidelines for use in patients with renal insufficiency; **OR**
- The patient has incompatible metallic clips on vascular aneurysms[1]; **OR**
- Incompatible implantable devices (e.g., pacemakers, defibrillators, cardiac valves); **OR**
- Metallic foreign body in orbits/other critical area(s) or within the field of view and obscuring area of concern.

*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: G, S, I, and N Codes are non-covered per CMS guidelines due to their experimental or investigational nature.

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.[46]

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 MR angiography or pulmonary angiography, reperfusion rates following coil embolization for pulmonary arteriovenous malformations (PAVMs) were notably elevated, especially in cases of repeat embolization.[47]

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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