Cohere Medical Policy - Magnetic Resonance Angiography (MRA), Lower Extremity

Clinical Guidelines for Medical Necessity Review

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Important Notices

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Guideline Information:

Specialty Area: Diagnostic Imaging
Guideline Name: Cohere Medical Policy - Magnetic Resonance Angiography (MRA), Lower Extremity

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

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Medical Necessity Criteria

Service: Magnetic Resonance Angiography (MRA), Lower Extremity

Recommended Clinical Approach

Magnetic resonance angiography (MRA) is a noninvasive alternative to catheter angiography for evaluating vascular structures in the lower extremities. Magnetic resonance venography (MRV) images veins instead of arteries. MRA and MRV are less invasive than conventional X-ray digital subtraction angiography.[1]

Medical Necessity Criteria

Indications

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

- MRA-preferred indications including **ANY** of the following:
  - Arterial entrapment syndrome, when ultrasound is indeterminate or for pre-treatment planning; **OR**
  - Adventitial cystic disease[1]; **OR**
- Ultrasound and CT/CTA are contraindicated or inconclusive (e.g., body habitus for ultrasound, anaphylactic reaction due to IV contrast reaction, pregnancy, pediatric) with **ANY** of the following:
  - Neoplastic conditions (including masses or mass-like conditions) when the arterial blood supply needs to be evaluated (e.g., for treatment planning, treatment response, or prognostication); **OR**
  - Neoplastic invasion of arteries or veins; **OR**
  - Trauma-related conditions as indicated by **ANY** of the following[2]:
    - Expanding hematoma[3]; **OR**
    - Major blunt trauma and the patient is hemodynamically stable[4]; **OR**
    - Neurologic deficit of lower extremity in association with trauma[5]; **OR**
    - Known or suspected knee dislocation*[6]; **OR**
    - Vascular trauma to a lower extremity[7]; **OR**

- Vascular conditions, known or suspected, including **ANY** of the following:
    - Aneurysm, seen on ultrasound or where ultrasound is nondiagnostic; **OR**
    - Intramural hematoma; **OR**
    - Dissection; **OR**
    - Critical limb ischemia strongly suspected (e.g., sudden onset of a cold leg with pain, gangrene, rest pain)[8]; **OR**
    - Lower extremity ischemic symptoms when **ALL** of the following is **TRUE**:
        - **ANY** of the following:
            - Leg pain worsens with activity and is relieved with rest (claudication); **OR**
            - Non-healing lower extremity ulcers; **AND**
        - **ALL** of the following:
            - Limitation of performance of daily activities; **AND**
            - Expected mobility after treatment warrants revascularization; **AND**
            - Revascularization is planned[9]; **AND**
            - Abnormal ankle-brachial index (ABI) as evidenced by **ANY** of the following:
                - ABI is inconclusive or nondiagnostic; **OR**
                - ABI less than 0.9 or greater than 1.4 on at least one leg; **OR**
                - ABI less than 1.1 in patients with risk factors for atherosclerosis (e.g., personal history of diabetes or known cardiac disease)[10]; **AND**
            - Either low concern for aortic and iliac artery disease or aorta and iliac arteries previously imaged; **OR**
    - Determination of hemorrhage source (including non-surgical, spontaneous)[10]; **OR**
    - Localization and characterization of vascular malformation or fistula (e.g., assessing treatment

response, treatment planning) with **ANY** of the following:
    - Duplex ultrasound indeterminate or nondiagnostic; **OR**
    - High flow lesion suspected clinically or by imaging; **OR**
    - Preoperative planning; **OR**
  - Vasculitis, initial evaluation, when **ANY** of the following is **TRUE**[7]:
    - Biopsy proven; **OR**
    - Rheumatologic panel work-up including but not limited to erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) is suggestive of vasculitis; **OR**
    - The requesting clinician specializes in rheumatology and the outcome of the imaging is expected to change management and/or treatment plan; **OR**
- Pre and post-intervention evaluation when **ANY** of the following is **TRUE**:
  - Postoperative evaluation of the effectiveness of arterial or venous reconstruction or bypass; **OR**
  - Characterization of normal and variant vascular anatomy; **OR**
  - Determination of the patency, location, or integrity of grafts and other vascular devices (e.g., stents); **OR**
  - Planning autografts for musculoskeletal reconstruction; **OR**
  - Treatment of popliteal entrapment syndrome; **OR**
- Hemodialysis access evaluation, when duplex ultrasound inconclusive and fistulogram cannot be performed, for **ANY** of the following conditions:
  - Arteriovenous fistula (AVF) stenosis; **OR**
  - Occlusion; **OR**
  - Pseudoaneurysm; **OR**
  - Steal syndrome (cool and painful extremity); **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.

➔ **Magnetic resonance venography (MRV), lower extremity** is considered appropriate if **ANY** of the following are **TRUE**:

- ◆ MRA-preferred indications including venous entrapment syndrome, when ultrasound is indeterminate or for pre-treatment planning; **OR**
- ◆ Ultrasound and CT/CTV are contraindicated or inconclusive (e.g., body habitus for ultrasound, anaphylactic reaction due to IV contrast reaction, pregnancy, pediatric) with **ANY** of the following:
  - Neoplastic conditions (including masses or mass-like conditions) when the arterial blood supply needs to be evaluated (e.g., for treatment planning, treatment-response, or prognostication); **OR**
  - Neoplastic invasion of arteries or veins; **OR**
  - Initial evaluation for a known venous leg ulcer, when ultrasound is indeterminate or non-diagnostic[11]; **OR**
  - Known or suspected acute or chronic deep venous thrombosis, when results would change management and ultrasound has been completed; **OR**
  - Known severe post-thrombotic changes incompletely evaluated by ultrasound[11]; **OR**
  - Evidence of severe venous reflux disease and **ALL** of the following[11]:
    - ○ Duplex ultrasound evaluation indeterminate, incomplete, or non-diagnostic; **AND**
    - ○ Surgical or endovascular intervention planned; **OR**
- ◆ Pre and post-intervention evaluation when **ANY** of the following is **TRUE**:
  - Postoperative evaluation of the effectiveness of arterial or venous reconstruction or bypass; **OR**

- Characterization of normal and variant vascular anatomy; **OR**
- Determination of the patency, location, or integrity of grafts and other vascular devices (e.g., stents); **OR**
- Planning autografts for musculoskeletal reconstruction; **OR**
- Treatment of popliteal entrapment syndrome; **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), lower extremity** 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[16]; **OR**

◆ 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 metallic clips on vascular aneurysms; **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; **OR**

◆ Evaluation of lower extremity arterial perfusion, such as for claudication, when there may be a concern for aorta or iliac disease and aorta and iliac have not been imaged.

*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

Inpatient or Outpatient

Procedure Codes (CPT/HCPCS)

CPT/HCPCS Code	Code Description
73725	Magnetic resonance angiography (MRA), lower extremity, with or without contrast material(s)
C8912	Magnetic resonance angiography (MRA) with contrast, lower extremity
C8913	Magnetic resonance angiography (MRA) without contrast, lower extremity
C8914	Magnetic resonance angiography (MRA) without contrast followed by with contrast, lower extremity

Medical Evidence

Nassar et al. (2022) reviewed imaging modalities for preoperative planning. Computed tomography angiography (CTA) and magnetic resonance angiography (MRA) can generate detailed 3D images of vascular structures and surrounding anatomy, with applications in preoperative planning for breast, head, neck, and extremity reconstructions. While MRA eliminates the need for radiation exposure, it is less precise than CTA in detecting perforators smaller than 1 mm and contraindicated in specific patient groups. For assessing venous anatomy, the most effective modalities include duplex ultrasound, MRV, and the outflow phase of conventional angiography. While MR scanners and software continue to advance, the general preference is for strength 1.5-T scanners in reconstructive applications. Lower-strength scanners allow enhanced fat suppression, contributing to more precise imaging of vascular structures.[12]

Tamura and Nakahara (2014) conducted a retrospective study to assess pelvic and deep vein thrombosis (DVT) in the lower extremities with magnetic resonance venography (MRV) before surgical intervention for varicose veins. Time-of-flight MRV evaluated the 72 patients enrolled in the study before stripping varicose veins of the lower extremities. A total of 63.9% were female, with a mean age of 65.2 plus or minus 10.2 years; 55.6% of patients had bilateral varicose leg veins; 2.8% of patients had DVT; and 4.2% were diagnosed with iliac vein thrombosis. The remaining patients could undergo the stripping procedure in the saphenous veins. The study concluded that non-contrast MRV helps evaluate the lower extremity venous system.[13]

Koelemay et al. (2001) conducted a meta-analysis of 34 studies (1090 patients) that reports a high accuracy for assessing arteries in the lower extremities using MRA. Three-dimensional (3D) gadolinium-enhanced MRA demonstrated enhanced diagnostic accuracy compared to 2D MRA. The estimated thresholds for equal sensitivity and specificity were 94% and 90% for 3D gadolinium-enhanced MRA and 2D MRA, respectively. Recent investigations specifically examined the diagnostic capabilities of lower extremity 3D gadolinium-enhanced MRA compared to digital subtraction angiography.[14]

Ersoy et al. (2008) report on the precision of 3D MRA in assessing bypass grafts and detecting recurrent issues within the graft lumen is comparable to its accuracy in native arteries. Foot and calf MRA exhibit sensitivity and specificity exceeding 80% and 90%, respectively. In contrast to digital subtraction angiography, gadolinium-enhanced MRA generates a 3D dataset

that can create displays reminiscent of multilane digital subtraction angiography after reformatting. These displays emphasize pertinent information for prognosis and treatment planning, such as arterial wall inflammation, plaque composition, and mural and intramural thrombus formation.[15]

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Clinical Guideline Revision History/Information

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Version 2	8/13/2024	Annual review and policy restructure.
Version 3	10/30/2024	Edited repeat imaging criteria language.