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

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

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Service: Magnetic Resonance Angiography (MRA), Upper Extremity

Recommended Clinical Approach

Magnetic resonance angiography (MRA) of the upper extremity is typically performed without and with gadolinium contrast. Although contrast-enhanced MRA (CE-MRA) is generally preferred, non-contrast-enhanced techniques are increasingly available. These may be a good option for patients with impaired renal function or who cannot tolerate gadolinium-based contrast agents. A broad spectrum of upper extremity vascular disorders can be assessed accurately using MRA of the upper extremity.[1]

Medical Necessity Criteria

Indications

- ➔ **Magnetic resonance angiography (MRA), upper extremity** is considered appropriate if **ALL** of the following are **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; **OR**
    - Intimal hyperplasia evaluation within vascular devices such as stents; **AND**
  - ◆ 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:
    - Clinical suspicion of acute or chronic limb ischemia, when ultrasound is inconclusive or nondiagnostic, with **ANY** of the following:
      - ○ Acute absence of radial or ulnar pulses; **OR**
      - ○ Acute changes in motor or sensory function; **OR**
      - ○ Symptoms with exercise attributable to vascular; **OR** etiologies such as muscle pain that resolves with rest, coolness, pallor, or fatigue; **OR**
    - 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; **OR**
    - Major blunt trauma and the patient is hemodynamically stable[3]; **OR**
    - Neurologic deficit of upper extremity in association with trauma[4]; **OR**
    - Vascular trauma to an upper extremity[5]; **OR**
- Vascular conditions, known or suspected, including **ANY** of the following:
    - Aneurysm, seen on ultrasound or when ultrasound is nondiagnostic; **OR**
    - Intramural hematoma; **OR**
    - Dissection; **OR**
    - Non-healing upper extremity ulcers with abnormal or inconclusive ultrasound results (e.g. arterial Doppler); **OR**
    - Determination of hemorrhage source (including non-surgical, spontaneous); **OR**
    - Localization and characterization of vascular malformation (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**[6]:
        - 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**
    - Non-inflammatory vasculopathies that are symptomatic such as Raynaud's, Buerger's disease, fibromuscular dysplasia, or scleroderma; **OR**
    - Vascular steal syndrome of the upper extremity, is suspected, and initial imaging is needed to guide therapy[6]; **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**
- Hemodialysis access evaluation, when duplex ultrasound is 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 of a specific area or structure using the same imaging modality (in the absence of an existing follow-up guideline) is considered appropriate when **ALL** of the following are **TRUE**:
    - There is documented clinical necessity; **AND**
    - Prior imaging results of the specific area or structure, obtained using the same imaging modality, must be documented and available for comparison; **AND**
    - **ANY** of the following is **TRUE**:
        - A change in clinical status, such as worsening symptoms or the emergence of new symptoms, that

may influence the treatment approach; **OR**
    - The requirement for interval reassessment, which may alter the treatment plan; **OR**
    - One-time follow-up of a prior indeterminate finding to assess for interval change; **OR**
    - The need for re-imaging either before or after performing an invasive procedure.

➔ **Magnetic resonance venography (MRV), upper extremity** is considered appropriate if **ANY** of the following is **TRUE**[1]:
- 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 known venous upper extremity ulcer, when ultrasound is indeterminate or non-diagnostic; **OR**
    - Known or suspected acute or chronic deep venous thrombosis, when results would change, or management and ultrasound have been completed[6]; **OR**
    - Known severe post-thrombotic changes incompletely evaluated by ultrasound; **OR**
    - Subclavian or central venous obstruction such as subclavian vein thrombosis, Paget-Schroetter syndrome, thoracic outlet syndrome, either known or suspected clinically (e.g., edema aggravated by exercise/arm position); **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**
    - Repeat imaging of a specific area or structure using the same imaging modality (in the absence of an existing follow-up guideline) is considered appropriate when **ALL** of the following are **TRUE**:
        - There is documented clinical necessity; **AND**
        - Prior imaging results of the specific area or structure, obtained using the same imaging modality, must be documented and available for comparison; **AND**
        - **ANY** of the following is **TRUE**:
            - A change in clinical status, such as worsening symptoms or the emergence of new symptoms, that may influence the treatment approach; **OR**
            - The requirement for interval reassessment, which may alter the treatment plan; **OR**
            - One-time follow-up of a prior indeterminate finding to assess for interval change; **OR**
            - The need for re-imaging either before or after performing an invasive procedure.

Non-Indications

- ➔ **Magnetic resonance angiography (MRA), upper 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; **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.

*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
73225	Magnetic resonance angiography (MRA), upper extremity, with or without contrast material(s)
C8934	Magnetic resonance angiography (MRA), with contrast, upper extremity
C8935	Magnetic resonance angiography (MRA), without contrast, upper extremity
C8936	Magnetic resonance angiography (MRA), without contrast followed by with contrast, upper extremity

Medical Evidence

Nassar et al. (2022) reviewed imaging modalities for preoperative planning. CTA and 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. 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 1.5-T scanners in reconstructive applications. Lower-strength scanners allow enhanced fat suppression, contributing to clearer imaging of vascular structures.[8]

Ghouri et al. (2019) review the successes and failures of CTA and MRA of the upper extremities. These modalities are preferred over Doppler or digital subtraction angiography (DSA), especially in patients without contraindications to MRI. Soft tissue characterization is improved with MRA and does not expose the patient to radiation. Venous and neurological compression is also successfully evaluated with MRA. As imaging modalities, particularly CTA and MRA, continue to advance, the authors stress the importance of identifying the strengths and weaknesses of different techniques to obtain the most effective imaging test.[6]

The American College of Radiology, the North American Society for Cardiovascular Imaging (NASCI), and the Society for Pediatric Radiology (SPR) developed a 2020 updated practice parameter for the performance of body magnetic resonance angiography (MRA). They state that contrast-enhanced MRA is as effective as standard angiography in the evaluation of diseases related to the vascular system as well as the planning of treatment. MRA is less invasive than catheter-based angiography, reducing the risk of injury to the vascular system being examined. Noncontrast MRA is available to

patients in whom contrast media is contraindicated. Specific extremity MRA evaluations include arterial occlusions, congenital anomalies, and aneurysms, as well as venous malformations, causes of peripheral edema, and varicose veins. MRA is effective in planning for dialysis access placement.[1]

References

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Clinical Guideline Revision History/Information

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Version 2	8/13/2024	Annual review and policy restructure.