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2024 Magnetic Resonance Angiography/ Magnetic Resonance Venography (MRA/ MRV) Upper Extremities

Diagnostic Imaging

MRA-UpperExt-HH

Last Review Date: 10/28/2024
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Magnetic Resonance Angiography/Venography (MRA/MRV) Upper Extremities

MRA Contraindications

An MRA may be contraindicated for **ANY** of the following:

- Safety, related to clinical status (eg, body mass index exceeds MR capability, intravascular stents within recent 6 weeks)
  References: [7] [21] [16] [11] [3]
- Safety, related to contrast (eg, allergy, renal impairment)
  References: [7] [21] [16] [11] [3]
- Safety, related to implanted devices (aneurysm clip, cochlear implant, insulin pump, spinal cord stimulator)
  References: [7] [21] [16] [11] [3]

IMPORTANT
Some implanted devices that were once absolute contraindications to a MRI, may now be accepted. Considerations include if the MRI is able to accommodate the device, or the device is deemed safe for MRI.

NCD 220.2
See also, **NCD 220.2**: Magnetic Resonance Imaging at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

Preamble: Pediatric Diagnostic Imaging

HealthHelp's clinical guidelines for the Diagnostic Imaging program, are intended to apply to both adults and pediatrics (21 years of age or younger), unless otherwise specified within the criteria.

MRA/MRV Upper Extremities Guideline

Magnetic resonance angiography or magnetic resonance venography (MRA/MRV) of the upper extremities is considered medically appropriate when the documentation demonstrates **ANY** of the following:

1. Deep venous thrombosis (DVT) or embolism is suspected or known and **ANY** of the following:
    a. Arterial emboli in the upper extremity is suspected.
    b. Central veins evaluation
    c. Ultrasound of arm veins is abnormal, non-diagnostic or indeterminate and treatment planning depends on results.

    References: [20] [14] [8]

2. Hand ischemia is suspected or known and **ANY** of the following:
    a. Acute symptoms to evaluate for **ANY** of the following: (*__NOTE__: *Arterial ultrasound is not needed for acute symptoms*)
        i. Digit loss is imminent.
        ii. Ischemic ulceration and **NO** segmental temperature change
        iii. Ischemic ulceration with painful ischemia
        iv. Perfusion loss is acute **AND** sustained when acral ulceration is present or **ABSENT**.
    b. Post revascularization procedure with recurrent symptoms **OR** ultrasound is non-diagnostic or indeterminate.
    c. Ulcers are known and vascular cause is suspected when ultrasound is abnormal, non-diagnostic or indeterminate.
    d. Vasculopathy (including Buerger disease and Raynaud's phenomenon) is suspected or known **AND** symptomatic (eg, cold, painful extremities, numbness) when vascular ultrasound is abnormal and treatment planning depends on results.

    References: [20] [12] [5]

3. Hemodialysis graft dysfunction and ultrasound is non-diagnostic or indeterminate, for treatment planning.
    References: [20] [13] [10]

4. Peri-procedural care to guide pre-procedure, invasive procedure planning or post-procedural follow-up.
    Reference: [20]

5. Prior MRA upper extremity imaging is non-diagnostic or indeterminate. (*__NOTE__: *One follow-up is appropriate to evaluate for changes since preceding imaging finding[s]. Further surveillance is appropriate when lesion is specified as "highly suspicious" or there is a change since last exam.*)

Reference: [20]

6. Traumatic injury is known and arterial injury is suspected, based on clinical finding.
   Reference: [20]
7. Vascular disease and **EITHER** of the following:
   a. Vascular disease is suspected, prior imaging (eg, ultrasound) is abnormal, non-diagnostic or indeterminate for **ANY** of the following:
      i. Aneurysm
      ii. Stenosis/occlusions
      iii. Trauma
      iv. Tumor invasion
      v. Vasculitis
   b. Vascular disease is known, for evaluation.

   References: [20] [9] [19] [15] [1]
8. Vascular malformation evaluation when an ultrasound is non-diagnostic or indeterminate.
   References: [20] [17] [18] [2]

MRA/MRV Extremities Considerations for Contrast

Magnetic resonance angiography/magnetic resonance venography (MRA/MRV) of the extremities considerations for using contrast for **ANY** of the following special circumstances:

1. Arterial obstruction, acute, is suspected. (*__NOTE__: *Arteriography is preferred [gold standard].*)
   References: [4] [6]
2. Bypass graft evaluation when ultrasound is non-diagnostic or indeterminate.
   References: [10] [13]
3. Renal impairment is known and the individual is **NOT** on dialysis, and **ANY** of the following: (*__NOTE__: *Individuals on dialysis should have a CTA with contrast.*)
   a. Impairment is mild to moderate (glomerular filtration rate [GFR] of 30 ml/min to 45 ml/min) (*__NOTE__: *MRA should be ordered*.)
   b. Impairment is severe (GFR is less than 30 ml/min). (*__NOTE__: *MRA **WITHOUT** contrast should be ordered*.)

LCD 33633
See also, **LCD 33633**: Magnetic Resonance Angiography (MRA) at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.

LCD 34424
See also, **LCD 34424**: Magnetic Resonance Angiography at https://www.cms.gov/medicare-coverage-database/search.aspx *if applicable to individual's healthplan membership*.
*__NOTE__: *As of 04/16/2025 there is not criteria in LCD 34424 for magnetic resonance angiography*.

MRA/MRV Upper Extremities Procedure Codes

Table 1. MRA Upper Extremity Associated Procedure Codes

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

MRA/MRV Upper Extremities Summary of Changes

MRA/MRV Upper Extremities guideline had the following version changes from 2023 to 2024:

- Added the following to keep in line with current research:
  - "Hemodialysis graft" indication
  - "Prior MRA upper extremity imaging" indication
  - "Traumatic injury" indication
- Citations updated per the evidence.
- Mid-cycle update: added Pediatric Preamble.
- Mid-cycle update: Added LCD 34424 per CMS website

MRA/MRV Upper Extremities Definitions

Aneurysm refers to weakness in an artery wall, allowing it to abnormally balloon out or widen.
Arteriovenous malformation (AVM) are congenital high-flow vascular malformations characterized by abnormal shunting of blood from high-flow feeding arteries to low-resistance veins via a cluster of aberrant blood vessels termed a central nidus, bypassing the normal capillary bed.
Buerger's disease (also known as thromboangiitis obliterans) affects blood vessels in the body, most commonly in the arms and legs. Blood vessels swell, which can prevent blood flow, causing clots to form. This can lead to pain, tissue damage and even gangrene (the death or decay of body tissues).
Embolism is an obstruction of an artery, typically by a clot of blood or an air bubble, that has traveled from another part of the body.
Indeterminate findings are inconclusive or insufficient for treatment planning.
Ischemia is a deficient supply of blood to a body part (such as the heart or brain) due to obstruction of the inflow of arterial blood.
Magnetic resonance angiogram (MRA) is a test that uses a magnetic field and pulses of radio wave energy to provide images of blood vessels inside the body, allowing for evaluation of blood flow and blood vessel wall condition. MRA is used to look for aneurysms, clots, tears in the aorta, arteriovenous malformations and stenosis caused by plaque in the carotid arteries (neck) or blood vessels leading to the lungs, kidneys or legs.
Magnetic resonance venogram (MRV) is a diagnostic procedure that uses a combination of a large magnet, radiofrequencies, and a computer to produce detailed images of organs and structures within the body. An MRV uses magnetic resonance technology and intravenous (IV) contrast dye to visualize the veins. Contrast dye causes the blood vessels to appear opaque on the X-ray image, allowing the visualization the blood vessels being evaluated. MRV is useful in some cases because it can help detect causes of leg pain other than vein problems.
Non-diagnostic is a result that does not lead to a confirmed diagnosis.
Pediatric approximate ages are defined by the US Department of Health (USDH), the Food and Drug Administration (FDA), and the American Academy of Pediatrics (AAP) as the following:

- Infancy, between birth and 2 years of age
- Childhood, from 2 to 12 years of age
- Adolescence, from 12 to 21 years of age, further defined by the AAP into:
    1. Early (ages 11–14 years)
    2. Middle (ages 15–17 years),
    3. Late (ages 18–21 years)

4. Older ages may be appropriate for children with special healthcare needs.

Raynaud's phenomenon/syndrome is a vascular disorder marked by recurrent spasm of the capillaries especially fingers and toes upon exposure to cold, characterized by pallor, cyanosis and redness in succession; usually accompanied by pain and in severe cases can progress to localized gangrene.
Stenosis is a narrowing or constriction of the diameter of a bodily passage or orifice.
Thrombosis is the formation of a blood clot (partial or complete blockage) within blood vessels, whether venous or arterial, limiting the natural flow of blood and resulting in clinical sequela.
Ulcerated is a break in the skin or mucous membrane with loss of surface tissue, disintegration and necrosis of epithelial tissue and often pus.
Ultrasound is the diagnostic or therapeutic use of ultrasound and especially a noninvasive technique involving the formation of images used for the examination and measurement of internal body structures and the detection of bodily abnormalities.
Vasculitis involves inflammation of the blood vessels. The inflammation can cause the walls of the blood vessels to thicken, which reduces the width of the passageway through the vessel. If blood flow is restricted, it can result in organ and tissue damage.

MRA/MRV Upper Extremities References

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