04-70540-15

Original Effective Date: 07/01/07

Reviewed: 04/24/25

Revised: 05/15/25

Subject: Magnetic Resonance Imaging (MRI) Upper Extremity

DESCRIPTION:

Magnetic resonance imaging (MRI) is a radiation-free, noninvasive, technique used to produce high quality sectional images of the inside of the body in multiple planes. MRI uses natural magnetic properties of the hydrogen atoms in the body that emit radiofrequency signals when exposed to radio waves within a strong magnetic field. These signals are processed and converted by a computer into high-resolution, three-dimensional, tomographic images. Images and resolution produced by MRI is quite detailed. For some MRI, contrast materials (e.g., gadolinium, gadoteridol, non-ionic and low osmolar contrast media, ionic and high osmolar contrast media) are used to enable visualization of a body system or body structure.

The U.S. Food and Drug Administration's (FDA) cleared MRI systems for marketing through the 510(k) process. The Fonar Stand-Up MRI system received FDA marketing clearance in October 2000.

Summary and Analysis of Evidence: Magnetic resonance imaging (MRI) is a multiplanar imaging method based on an interaction between radiofrequency electromagnetic fields and certain nuclei in the body (usually hydrogen nuclei) after the body has been placed in a strong magnetic field. MRI differentiates between normal and abnormal tissues, providing a sensitive examination to detect disease. This sensitivity is based on the high degree of inherent contrast due to variations in the magnetic relaxation properties of different tissues, both normal and diseased, and the dependence of the MRI signal on these tissue properties. MRI is a proven, established imaging modality for the detection, evaluation, assessment, staging, and follow-up of tumors of the musculoskeletal (MSK) system. MRI is useful in the initial diagnosis and identification of local recurrence and useful to guide biopsy, inform treatment planning, and assess response to therapy. MRI is a useful in the evaluation of MSK infections, detecting bone marrow abnormalities and characterization of soft-tissue abnormalities. In the extremities, MRI is usually the study to confirm or exclude clinically suspected infections, to stage the local extent of disease, and to follow-up after treatment. MRI is useful for the detection, evaluation, staging, and

follow-up of disorders of the wrist, elbow and shoulder. MRI serves as a guide to treatment planning and prognosis (ACR 2020, 2021, 2022).

POSITION STATEMENT:

Magnetic resonance imaging (MRI) upper extremity **meets the definition of medical necessity** for the following:

Joint or muscle pain without positive findings on an orthopedic exam as listed below (after x-ray completed)

- Persistent joint or musculotendinous pain unresponsive to conservative therapy, within the last 6 months which includes active medical therapy (physical therapy, chiropractic treatments, and/or physician supervised exercise) of at least four (4) weeks; **OR**
- With progression or worsening of symptoms during the course of conservative treatment (see above statement).

Joint specific orthopedic examination

- Shoulder
  - Any of the following positive test:
    - Rotator cuff weakness
    - Bear hug test
    - Drop arm test
    - Full can test
    - Hornblower's sign
    - Internal rotation lag sign
    - Supraspinatus test
- Elbow
  - Any of the following positive test:
    - Valgus stress
    - Varus stress
    - Posterolateral rotatory drawer test
    - Milking maneuver
    - Push-up test
- Wrist
  - Any of the following positive test:
    - Watson test (scaphoid shift test)
    - Scapholunate ballottement test

- Reagan test (lunotriquetral ballottement test)

Evaluation of other shoulder conditions (after active conservative therapy)

- Shoulder impingement
- Non-traumatic shoulder instability
- Glenoid labral tear (i.e., SLAP lesion).

Shoulder dislocations

- Recurrent
- First time in any of the following situations that increase the risk of repeated dislocation
  - Glenoid or humeral bone loss on x-ray
  - 14-35 year-old competitive contact sport athlete.

Extremity mass

- Mass or lesion after non-diagnostic imaging.

Known cancer of the extremity

- Cancer staging
- Cancer restaging
- Signs or symptoms of recurrence.

Infection of bone or joint

- Abnormal Imaging.
- Negative imaging but with a clinical suspicion of infection.
- Ulcer with signs of infection that is not improving despite treatment and bone or deep infection is suspected.

Osteonecrosis (avascular necrosis (AVN))

- Abnormal x-ray.
- Normal X-rays, but symptomatic and high risk.

Evaluation of known or suspected autoimmune disease (e.g. rheumatoid arthritis)

- Further evaluation of an abnormality or non-diagnostic findings on prior imaging.
- Initial imaging of a single joint for diagnosis or response to therapy after plain films and appropriate tests (e.g., rheumatoid factor (RF), antinuclear antibody (ANA), C-reactive protein (CRP), erythrocyte sedimentation rate (ESR)).

- To determine change in treatment or when diagnosis is uncertain prior to start of treatment.
- Follow-up to determine treatment efficacy of early rheumatoid arthritis.
- Follow-up to determine treatment efficacy of advanced rheumatoid arthritis if x-ray and ultrasound are equivocal or noncontributory.

Bone fracture

- Suspected stress or insufficiency fracture with a negative initial x-ray.
- Intra articular fractures or carpal bone fractures or instability that may require surgery.
- Suspected scaphoid fracture with negative x-ray.
- Other upper extremity fractures that may require surgery.
- Nonunion or delayed union as demonstrated by no healing between two sets of x-rays.

Note: If a fracture has not healed by 4-6 months, there is delayed union. Incomplete healing by 6-8 months is nonunion.

Occult wrist ganglion, after indeterminate or negative ultrasound

- Clinical suspicion and failed 4 weeks conservative treatment including for **ALL** of the following:
  - Activity modification;
  - Rice, ice or heat;
  - Splinting or orthotics**; AND**
  - Medication.

Osteochondral lesions

- Clinical suspicion based on mechanism of injury and physical findings and imaging.
- Loose bodies or synovial chondromatosis seen on imaging.

Foreign body

- Indeterminate imaging.

Tendon or muscle rupture

- Clinical suspicion based on mechanism of injury and physical findings (e.g., Popeye, hook, Yergasons sign).

Peripheral nerve entrapment

- Abnormal electromyogram or nerve conduction study.
- Abnormal imaging.

- Clinical suspicion and failed 4 weeks conservative treatment including at least two of the following:
    - Activity modification
    - Rest, ice or heat
    - Splinting or orthotics
    - Medication.

Brachial plexopathy

- If mechanism of injury or electromyogram (EMG)/nerve conduction velocity (NCV) studies are suggestive

Pre-operative/procedural evaluation

- Pre-operative evaluation for planned surgery or procedure.
- Pre-operative evaluation for lipedema and lymphedema.

Post-operative/procedural evaluation

- When imaging, physical or laboratory findings indicate joint infection, delayed or non-healing or other surgical/procedural complications.
- Joint prosthesis loosening or dysfunction, x-rays non-diagnostic.

BILLING/CODING INFORMATION:

CPT Coding:

73218	Magnetic resonance (e.g., proton) imaging, upper extremity, other than joint; without contrast material(s)
73219	Magnetic resonance (e.g., proton) imaging, upper extremity, other than joint; with contrast material(s)
73220	Magnetic resonance (e.g., proton) imaging, upper extremity, other than joint; without contrast material(s), followed by contrast material(s) and further sequences
73221	Magnetic resonance (e.g., proton) imaging, any joint of upper extremity; without contrast material(s)
73222	Magnetic resonance (e.g., proton) imaging, any joint of upper extremity; with contrast material(s)
73223	Magnetic resonance (e.g., proton) imaging, any joint of upper extremity; without contrast material(s), followed by contrast material(s) and further sequences

HCPCS Coding:

S8042	Magnetic resonance imaging (MRI), low-field

REIMBURSEMENT INFORMATION:

Reimbursement for MRI imaging (73218-73223) performed on the same anatomical area is limited to one (1) MRI imaging within a 6-month period. MRI imaging (73218-73223) in excess of one (1) within a 6-month period is subject to medical review for medical necessity. Documentation should include radiology reason for study, radiology comparison study-date and time, radiology comparison study observation, radiology impression, and radiology study recommendation.

Additional MRI imaging of the same anatomical area may be appropriate for the following, including, but not limited to: diagnosis, staging or follow-up of cancer, follow-up assessment during or after therapy for known metastases, follow-up of member who have had an operative, interventional or therapeutic procedure (e.g., surgery, embolization), reevaluation due to change in clinical status (e.g., deterioration), new or worsening clinical findings, (e.g., neurologic signs, symptoms), medical intervention which warrants reassessment, reevaluation for treatment planning, follow-up during and after completion of therapy or treatment to assess effectiveness, and evaluation after intervention or surgery.

Reimbursement for MRI imaging (73218-73223) for an oncologic condition undergoing active treatment or active treatment completed within the previous 12 months on the same anatomical area is limited to four (4) MRI imaging (73218-73223) within a 12-month period. MRI imaging (73218-73223) for an oncologic condition in excess of four (4) within a 12-month period are subject to medical review of documentation to support medical necessity. Documentation should include radiology reason for study, radiology comparison study-date and time, radiology comparison study observation, radiology impression, and radiology study recommendation.

Re-imaging or additional imaging due to poor contrast enhanced exam or technically limited exam is the responsibility of the imaging provider.

Stand-Up MRI/Sitting MRI

Stand-up MRI and sitting MRI may be reported like a standard MRI. No additional payment will be made for stand-up MRI or sitting MRI.

LOINC Codes:

The following information may be required documentation to support medical necessity: physician history and physical, physician progress notes, plan of treatment and reason for magnetic resonance imaging (MRI) upper extremity.

Documentation Table	LOINC Codes	LOINC Time Frame Modifier Code	LOINC Time Frame Modifier Codes Narrative
Physician history and physical	28626-0	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Attending physician progress note	18741-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim

Plan of treatment	18776-5	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology reason for study	18785-6	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study-date and time	18779-9	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology comparison study observation	18834-2	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology-study observation	18782-3	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology-impression	19005-8	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim
Radiology study-recommendation (narrative)	18783-1	18805-2	Include all data of the selected type that represents observations made six months or fewer before starting date of service for the claim

PROGRAM EXCEPTIONS:

Federal Employee Plan (FEP): Follow FEP guidelines.

Medicare Advantage products:

No Local Coverage Determination (LCD) was found at the time of the last guideline reviewed date.

The following National Coverage Determination (NCD) was reviewed on the last guideline reviewed date: Magnetic Resonance Imaging, (220.2) located at cms.gov.

DEFINITIONS:

None

RELATED GUIDELINES:

Magnetic Resonance Spectroscopy (MRS), 04-70540-07

Magnetic Resonance Imaging (MRI) of the Breast, 04-70540-09

Magnetic Resonance Imaging (MRI) Brain and Head, 04-70540-11

Magnetic Resonance Imaging (MRI) Orbit, Face, Temporomandibular Joint (TMJ) and Neck, 04-70540-12

Magnetic Resonance Imaging (MRI) Chest & Cardiac, 04-70540-13

Magnetic Resonance Imaging (MRI) Abdomen and Pelvis, 04-70540-14

Magnetic Resonance Imaging (MRI) Lower Extremity, 04-70540-16

Magnetic Resonance Imaging (MRI) Spine (Cervical, Thoracic, Lumbar), 04-70540-17

OTHER:

Other names used to report MRI:
Nuclear Magnetic Resonance (NMR)
Open MRI

Other names used to report Positional MRI:
Position MRI (pMRI)
Sitting MRI
Stand-Up MRI
Standing MRI
Weight-bearing MRI

REFERENCES:

1. ACR–SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging (MRI) of Bone and Soft Tissue Tumors, Revised 2020.
2. ACR–SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging (MRI) of Bone, Joint, and Soft Tissue Infections in the Extremities, Revised 2021.
3. ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging (MRI) of the Elbow, Revised 2021.
4. ACR-SPR-SSR Practice Parameter for the Performance and Interpretation of Magnetic Resonance Imaging (MRI) of the Shoulder, Revised 2020.
5. ACR–SCBT-MR-SPR-SSR Practice Parameter for the Performance of Magnetic Resonance Imaging (MRI) of the Wrist,Revised 2022.
6. American College of Radiology ACR Appropriateness Criteria® Suspected Osteomyelitis, Septic Arthritis, or Soft Tissue Infection (Excluding Spine and Diabetic Foot), Revised 2022.
7. Colebatch AN, Edwards CJ, Ostergaard M et al. EULAR recommendations for the use of imaging of the joints in the clinical management of rheumatoid arthritis. Ann Rheum Dis. 2013 Jun;72(6):804-814.
8. Dong Q, Jacobson JA, Jamadar DA et al. Entrapment neuropathies in the upper and lower limbs: anatomy and MRI features. Radiol Res Pract. 2012;2012:230679.
9. Expert Panel on Musculoskeletal Imaging: Kransdorf MJ, Murphey MD, Wessell DE, et al. ACR Appropriateness Criteria® Soft-Tissue Masses. J Am Coll Radiol. 2018 May;15(5S):S189-S197.
10. Expert Panel on Musculoskeletal Imaging: Small KM, Adler RS, Shah SH, et al. ACR Appropriateness Criteria® Shoulder Pain-Atraumatic. J Am Coll Radiol. 2018 Nov;15(11S):S388-S402.

11. Gismervik SØ, Drogset JO, Granviken F, et al. Physical examination tests of the shoulder: a systematic review and meta-analysis of diagnostic test performance. BMC Musculoskelet Disord. 2017 Jan 25;18(1):41.
12. Glaudemans AWJM, Jutte PC, Cataldo MA, et al. Consensus document for the diagnosis of peripheral bone infection in adults: a joint paper by the EANM, EBJIS, and ESR (with ESCMID endorsement). Eur J Nucl Med Mol Imaging. 2019 Apr;46(4): 957-970.
13. Laya BF, Restrepo R, Lee EY. Practical Imaging Evaluation of Foreign Bodies in Children: An Update. Radiol Clin North Am. 2017 Jul;55(4):845-867. [Abstract]
14. Magee T. Utility of pre- and post-MR arthrogram imaging of the shoulder: effect on patient care. Br J Radiol. 2016 Jun;89(1062):20160028.
15. Pandey T, Slaughter AJ, Reynolds KA, et al. Clinical orthopedic examination findings in the upper extremity: correlation with imaging studies and diagnostic efficacy. Radiographics. 2014 Mar-Apr;34(2): e24-40.

COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 04/24/25.

GUIDELINE UPDATE INFORMATION:

07/01/07	New Medical Coverage Guideline.
01/21/08	Updated the Program Exceptions.
07/15/08	Scheduled review. No change in position statement. Updated references and related Internet links.
05/21/09	Removed Federal Employee Plan (FEP) from BCBSF Radiology Management program exception statement. Added FEP program exception statement: FEP is excluded from the National Imaging Associates (NIA) review; follow FEP guidelines.
07/01/09	Updated BCBSF Radiology Management program exception; added BlueSelect.
01/01/10	Revised BCBSF Radiology Management program exception section.
07/15/10	Annual review: format changes, added indications for bone marrow MRI, added program exception for Medicare Advantage products, and updated references.
10/15/10	Revision related 2010 ICD-9 code added; added 237.73, 237.79, and 447.70 – 447.73 for 73218, 73219, 73220, 73221, 73222, and 73223 to Medicare Advantage products program exception.
10/01/11	Revision; formatting changes.
11/15/12	Annual review; Added indications for the following: evaluation of suspicious mass/tumor, evaluation of known cancer, evaluation of known or suspected infection or inflammatory disease, evaluation of suspected avascular necrosis, evaluation of suspected or known auto immune disease, evaluation of known or suspected fracture and/or injury, evaluation of persistent pain and initial imaging (e.g., x-ray) has been performed, post-operative/procedural evaluation and other indications for an upper extremity MRI (hand, wrist, arm, elbow, or shoulder). Added criteria for imaging which exceed limit. Added statement for re-imaging or additional imaging. Added Medicare

	Advantage program exception (nationally non-covered indications); MRI of cortical bone and calcifications and procedures involving spatial resolution of bone and calcifications. Deleted Medicare Advantage products ICD-9 codes. Updated references.
01/01/14	Review/revision. Updated program exception.
01/15/15	Scheduled review; added pre-operative/pre-procedural evaluation. Added limitation statement for an oncologic condition; limited to four (4) computed tomography within a 12-month period. Updated references.
07/15/18	Revision; revised position statement. Updated references.
02/15/20	Review and revision. Added indication and criteria for: extremity mass, known cancer, infection of bone or joint, osteonecrosis (avascular necrosis), known or suspected autoimmune disease, bone fracture or ligament injury, joint or muscle pain, occult wrist ganglion, osteochondral lesions, foreign body, tendon or muscle rupture after x-ray, peripheral nerve entrapment and joint specific provocative orthopedic examination. Added indication for MRI ordered as MR arthrogram, hemarthrosis and brachial plexopathy. Revised criteria for pre-operative and post-operative procedural evaluation. Updated references.
01/01/22	Revision; added pre-operative/procedural evaluation of lipedema and lymphedema.
05/15/22	Review/revision. Added indication and criteria for: joint or muscle pain, other shoulder conditions, shoulder dislocations, and bone fracture. Revised joint specific provocative orthopedic examination, extremity mass, known cancer, tendon or muscle rupture, and conservative therapy. Revised and expanded criteria for: infection of bone or joint, osteonecrosis, autoimmune disease, occult wrist ganglion, and osteochondral lesions. Added criteria for brachial plexopathy. Updated references.
07/01/22	Revision to Program Exceptions section.
09/30/23	Review: position statements and references updated.
05/15/24	Review; no change in position statement. Updated references
05/15/25	Review; no change in position statement.