

## 2011 Imaging Criteria

Magnetic Resonance Imaging (MRI), Extremity<sup>(1\*RIN, 2)</sup>

ICD-9-CM: 88.94

CPT: 73218, 73219, 73220, 73718, 73719, 73720

I/O Setting: Outpatient

## INDICATION(S)

- 100 Preoperative evaluation of osteomyelitis
- 200 Suspected osteomyelitis
- 300 Suspected bone tumor
- 400 Follow-up single bone metastasis after Rx
- 500 Follow-up primary bone tumor
- 600 Palpable mass of extremity

100 Preoperative evaluation of osteomyelitis<sup>(3)</sup>200 Suspected osteomyelitis **[Both]**210 Findings **[One]**<sup>(4)</sup>

211 ESR &gt; 30 mm/hr

212 Temperature &gt; 100.4 F(38.0 C)

213 WBC > 10,000/cu.mm( $10 \times 10^9/L$ )

214 Blood culture positive

215 C-reactive protein &gt; 10 mg/L

220 X-ray nondiagnostic for osteomyelitis

300 Suspected bone tumor **[Both]**<sup>(5\*RIN)</sup>310 Sx/findings **[One]**

311 Pain at site

312 Bone lesion at site by imaging

320 Bone scan **[One]**

321 Negative

322 Single positive site

400 Follow-up single bone metastasis after Rx **[Both]**<sup>(6)</sup>

410 Initial MRI positive at site

420 After chemotherapy/radiation Rx completed<sup>(7)</sup>500 Follow-up primary bone tumor **[Both]**<sup>(6)</sup>

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- 510 Initial MRI positive at site
- 520 Periodic assessment [**One**]
  - 521 During chemotherapy<sup>(8)</sup>
  - 522 After chemotherapy/radiation Rx/surgery completed<sup>(7, 9)</sup>
  - 523 New/worsening Sx/findings at site [**One**]
    - 1 Pain
    - 2 Swelling/mass
- 600 Palpable mass of extremity [**All**]<sup>(10)</sup>
  - 610 No evidence of infection by PE
  - 620 No recent trauma by Hx
  - 630 X-ray nondiagnostic for etiology of mass

## Notes

**(1)-RIN:**

These criteria apply to MRI of the extremities, not the joints. For pathology of a specific joint, see the MRI criteria subset for that joint (e.g., "Magnetic Resonance Imaging (MRI), Knee").

**(2)**

The following are examples of relative and absolute contraindications to the use of magnetic resonance imaging:

- Implanted devices that are electrically or magnetically activated (e.g., cardiac pacemakers, automatic cardioverter defibrillators, drug infusion pumps, cochlear implants)
- Ferromagnetic metal objects (e.g., cerebral aneurysm clips, intraocular metallic foreign body, prostheses, screws)
- Pregnancy, first trimester
- Renal insufficiency in cases when magnetic resonance imaging is performed with gadolinium-based contrast

**(3)**

CT and MRI can both be used to image osteomyelitis. CT is used to reveal the location and amount of bone destruction, but it is less sensitive for detecting early marrow changes not associated with cortical bone abnormalities (Tay et al., J Am Acad Orthop Surg 2002; 10(3): 188-197). MRI is superior for assessment of bone marrow involvement, vertebral end plate destruction, and the spread of infection into the spinal canal, nerve roots, and soft tissue (Nikkanen et al., J Emerg Med 2002; 22(3): 279-283; Stabler and Reiser, Radiol Clin North Am 2001; 39(1): 115-135).

**(4)**

If the patient is immunocompromised, fever may not be present and the WBC may be unchanged or low.

**(5)-RIN:**

This indication addresses the initial diagnosis of a bone tumor, not the assessment of response to therapy. For suspected metastatic disease (pain at multiple sites, cancer by history) a bone scan provides information about occult metastases at other sites and is the appropriate initial study. For suspected metastatic disease, see the "Bone Scan" criteria subset.

**(6)**

In many cases, x-ray may provide enough information to follow these lesions. X-ray should be considered as an alternative to CT or MRI.

**(7)**

The assessment is generally performed about 6 weeks after radiation is completed or after chemotherapy is completed.

**(8)**

The assessment is generally not necessary more frequently than every two cycles of chemotherapy.

**(9)**

These patients may be followed as frequently as every 3 months for the first 2 years after therapy and may receive continued periodic assessment as long as 5 years after initial treatment.

**(10)**

MRI is the study of choice to characterize soft tissue masses, and is capable of defining the extent of involvement (American College of Radiology. ACR Appropriateness Criteria for Soft Tissue Masses 2005 [cited 2009 April 6]).