

National Imaging Associates, Inc.*	
Clinical guidelines BONE MARROW MRI	Original Date: July 2008
CPT Codes: 77084	Last Revised Date: June 2021
Guideline Number: NIA_CG_059	Implementation Date: January 2022

INDICATIONS FOR BONE MARROW MRI (images entire body)

- For the diagnosis, staging and follow-up of patients with multiple myeloma, as well as leukemia and other related hematological malignancies ([NCCN, 2021](#); Angtuaco, 2004; Dutoit, 2016; [NCCN, 2021](#))
- Suspected progression of smoldering multiple myeloma (SMM) to multiple myeloma (MM) or high risk SMM patients (Caers, 2016; IMWG, 2015; [NCCN 2021](#))-
- Diagnosis and assessment of treatment response in diffuse or multifocal marrow disorders (e.g., Chronic Recurrent Multifocal Osteomyelitis; marrow involvement in storage diseases, such as Gaucher's, or hematologic malignancies/[processes \(e.g., Waldenström macroglobulinaemia\)](#) -when the diagnosis is in doubt) (Laudermann, 2016; Simpson, 2014; Voit, 2015)-
- A follow-up study may be needed to help evaluate a patient's progress after treatment, procedure, intervention, or surgery. Documentation requires a medical reason that clearly indicates why additional imaging is needed for the type and area(s) requested.

BACKGROUND

Magnetic Resonance Imaging (MRI) is currently used for the detection of metastatic disease to the bone marrow. Bone marrow MRI, using moving tables and special coils to survey the whole body, is used for screening to search for primary tumors and metastases. The unique soft-tissue contrast of MRI enables precise assessment of bone marrow infiltration and adjacent soft tissues allowing detection of alterations within the bone marrow earlier than with other imaging modalities. MRI results in a high detection rate for both focal and diffuse disease, mainly due to its high sensitivity in directly assessing the bone marrow components: fat- and ~~water-water~~-bound protons.

When bone marrow MRI is indicated, it is a single CPT code study with large field of view images covering the osseous structures, usually in two planes. The study covers from the vertex

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to the heels. Individual CPT codes corresponding to multiple separate studies of portions of the axial and appendicular skeleton are not necessary for bone marrow MRI.

Some conditions with diffuse marrow infiltration are not confined to the musculoskeletal system. Additional dedicated organ MRI exams may also be required for these patients.

OVERVIEW

MRI allows bone marrow components to be visualized and is the most sensitive technique for the detection of bone marrow pathologies. The soft-tissue contrast of MRI enables detection of alterations within the bone marrow before osseous destruction becomes apparent on CT. Whole body bone marrow MRI has been applied for bone marrow screening of metastasis, as well as for systemic primary bone malignancies, such as multiple myeloma (MM). Sensitive detection is mandatory ~~in order to~~ estimate prognosis and to determine adequate therapy.

Multiple myeloma and related conditions include: “1. Multiple myeloma- monoclonal proliferation of plasma cells with myeloma-defining CRAB (Calcium level elevation, Renal failure, Anemia, or Bone lesions) findings; 2. MGUS (monoclonal gammopathy of undetermined significance) - monoclonal proliferation of plasma cells without myeloma-defining CRAB; 3. Solitary plasmacytoma – monoclonal plasma cells manifesting as a single tumor; and 4. Smoldering myeloma - monoclonal proliferation of plasma cells in bone marrow and/or serum/urine with abnormal levels of monoclonal protein” (Navarro, 2017).

MRI findings are included as one of the International Myeloma Working Group (IMWG) diagnostic criteria of active myeloma (Dutoit, 2016). Although MRI is not the only imaging tool for diagnosis, when “more than one focal lesion on MRI that is at least 5mm or greater in size” in addition to >10% clonal bone marrow plasma cells, the diagnosis of active myeloma can be made. For smoldering multiple myeloma (SMM), defined as asymptomatic patients with increased levels of M protein and increased bone marrow plasma cells, “The IMWG now recommends that one of following: PET-CT, Low dose whole body CT (LDWBCT), or MRI of the whole body or spine (Bone marrow MRI) be done in all patients with suspected smoldering myeloma, with the exact imaging modality determined by availability and resources” (IMWG, 2015; Kumar, 2020). The importance of imaging in the diagnosis of active myeloma is highlighted as “The IMWG consensus statement now recommends that SMM patients with more than one unequivocal focal lesion (diameter > 5 mm) should be considered to have symptomatic myeloma that requires treatment” (Dutoit, 2016). Recent advances have allowed the identification of a subset of SMM patients with a greater than 80% risk of progression to MM in 2 years based on biomarkers (Caers, 2016).

POLICY HISTORY

Date	Summary
June 2021	<ul style="list-style-type: none"> ● <u>Clarified hematologic malignancies/ processes (e.g., Waldenström macroglobulinaemia)</u> ● <u>Updated references</u>
<u>May 2020</u>	<ul style="list-style-type: none"> ● <u>Added description of Whole body bone marrow MRI in background section</u> ● <u>Added Low dose CT in evaluation of myeloma, in background section</u> ● <u>Updated references</u>
<u>April 2019</u>	<ul style="list-style-type: none"> ● <u>Removed indication “vertebral fractures with suspected bone metastasis’</u> ● <u>Added indication: “Diagnosis and assessment of treatment response in diffuse or multifocal marrow disorders (e.g. Chronic Recurrent Multifocal Osteomyelitis; marrow involvement in storage diseases such as Gaucher’s; or hematologic malignancies when the diagnosis is in doubt)”</u> ● <u>Added Background info to clarify when this study is indicated</u> ● <u>Added Overview section to explain multiple myeloma and related conditions</u> ● <u>Updated references</u>

April 2019

- ~~Removed indication “vertebral fractures with suspected bone metastasis’~~
- ~~Added indication: “Diagnosis and assessment of treatment response in diffuse or multifocal marrow disorders (e.g. Chronic Recurrent Multifocal Osteomyelitis; marrow involvement in storage diseases such as Gaucher’s; or hematologic malignancies when the diagnosis is in doubt)”~~
- ~~Added Background info to clarify when this study is indicated~~
- ~~Added Overview section to explain multiple myeloma and related conditions~~
- ~~Updated references~~

May 2020

- ~~Added description of Whole body bone marrow MRI in background section~~
- ~~Added Low dose CT in evaluation of myeloma, in background section~~
- ~~Updated references~~

June 2021

- ~~Clarified hematologic malignancies/ processes (e.g. Waldenström macroglobulinaemia)~~
- ~~Updated references~~

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Reviewed / Approved by NIA Clinical Guideline Committee

GENERAL INFORMATION

It is an expectation that all patients receive care/services from a licensed clinician. All appropriate supporting documentation, including recent pertinent office visit notes, laboratory data, and results of any special testing must be provided. If applicable: All prior relevant imaging results and the reason that alternative imaging cannot be performed must be included in the documentation submitted.

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