Effective for dates of service on or after April 1, 2013, refer to:
www.bcbsal.com/providers/policies/index.cfm

Name of Policy:
Magnetic Resonance Imaging for Bone Marrow Blood Supply

Policy #: 297
Category: Radiology
Latest Review Date: February 2013
Policy Grade: B

Background/Definitions:
As a general rule, benefits are payable under Blue Cross and Blue Shield of Alabama health plans only in cases of medical necessity and only if services or supplies are not investigational, provided the customer group contracts have such coverage.

The following Association Technology Evaluation Criteria must be met for a service/supply to be considered for coverage:

1. The technology must have final approval from the appropriate government regulatory bodies;
2. The scientific evidence must permit conclusions concerning the effect of the technology on health outcomes;
3. The technology must improve the net health outcome;
4. The technology must be as beneficial as any established alternatives;
5. The improvement must be attainable outside the investigational setting.

Medical Necessity means that health care services (e.g., procedures, treatments, supplies, devices, equipment, facilities or drugs) that a physician, exercising prudent clinical judgment, would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury or disease or its symptoms, and that are:

1. In accordance with generally accepted standards of medical practice; and
2. Clinically appropriate in terms of type, frequency, extent, site and duration and considered effective for the patient’s illness, injury or disease; and
3. Not primarily for the convenience of the patient, physician or other health care provider; and
4. Not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient’s illness, injury or disease.
**Description of Procedure or Service:**
MRI is the imaging modality of choice in the investigation of bone marrow disorders. The bone marrow can be affected by a wide variety of pathologic processes, such as myeloproliferative diseases, osteomyelitis, and hemochromatosis, but metastatic disease and multiple myeloma are the most common causes of bone marrow disease. Bone marrow disease conditions can be grouped according to common pathophysiologic patterns. Marrow reconversion includes disease where there is an increased need for hematopoietic marrow, such as thalassemia. Marrow infiltration or replacement is most commonly due to neoplastic disease, including leukemia, lymphoma, metastatic disease, and multiple myeloma. Myeloid depletion disorders are characterized by replacement of the hematopoietic elements by fat cells. These processes include aplastic anemia, radiation therapy, and chemotherapy. Bone marrow ischemia encompasses both avascular necrosis of subchondral bone and medullary bone infarcts. This may be due to trauma, sickle cell anemia, corticosteroid excess, dysbaric osteonecrosis, alcoholism, or Gaucher’s disease.

There are some potential problems that may be encountered in the interpretation of bone marrow MR imaging, such as the recognition of normal variants. These include residual islands of hematopoietic marrow, especially in the proximal femur and humerus; residual red marrow in the proximal humeral epiphysis and femoral capital epiphysis; and focal fatty marrow, especially in the spine. Other problems include technical problems with the spin-echo images, differentiating benign from malignant processes, and differentiating benign osteoporotic compression fracture of the spine from pathologic compression fracture due to malignant processes.

**Policy:**
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Effective for dates of service on or after March 1, 2007 through March 31, 2013, Magnetic resonance imaging (MRI) for bone marrow blood supply meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the following conditions when medically necessary and supported by clinical and laboratory findings:

- Marrow reconversion including but not limited to:
  - Severe anemia, especially thalassemia
- Marrow infiltration or replacement due to cancer or metastasis
- Untreated aplastic anemia
- Bone marrow ischemia including but not limited to:
  - Trauma
  - Sickle cell anemia
  - Endogenous (Cushing’s syndrome) and exogenous corticosteroid excess
  - Dysbaric osteonecrosis (“the bends”)
  - Alcoholism
  - Gaucher’s disease
- Marrow response after radiation therapy
Individual case consideration will be given to patients with conditions not described above. Clinical notes will be required for review.

*Blue Cross and Blue Shield of Alabama does not approve or deny procedures, services, testing, or equipment for our members. Our decisions concern coverage only. The decision of whether or not to have a certain test, treatment or procedure is one made between the physician and his/her patient. Blue Cross and Blue Shield of Alabama administers benefits based on the members' contract and corporate medical policies. Physicians should always exercise their best medical judgment in providing the care they feel is most appropriate for their patients. Needed care should not be delayed or refused because of a coverage determination.*

**Key Points:**
There have been a few published reports looking at the usefulness of MRI in detecting bone marrow infiltration or bone marrow metastases in small groups of patients. Some of these are summarized below.

Tsunoda, et al (1997), evaluated 56 patients with lymphoma (48 non-Hodgkin’s, eight Hodgkin’s) to determine the clinical and prognostic significance of MRI of the femoral marrow. The results showed abnormal “positive” images in 29 of 56 patients (52%). The three-year survival rate in patients with a normal MRI pattern was 89.9% and in patients with a positive MRI was 41%, a statistically significant difference.

Freedman, et al (1999), compared the accuracy of bone marrow MRI to radioisotopic bone scans to detect metastatic disease in 19 men with prostate cancer. The results showed the bone marrow MRI detected metastatic disease in 1/13 patients (7%) with negative bone scans. Of the four patients with indeterminate bone scans, two had true positive MRIs, one had true negative MRI, and one had false positive MRI on the basis of subsequent clinical follow up. The authors concluded that further investigation of the use of bone marrow MRI to stage locally advanced or recurrent disease is justified.

Steinborn, et al (1999), compared the use of whole body bone marrow MRI with bone scintigraphy to detect bone metastases. The results showed MRI detected 96/105 (91.4%) of the confirmed lesions, and bone scintigraphy detected 89/105 (84.4%). The authors concluded that in this study, whole body bone marrow MRI was an effective method for evaluating the skeletal system in patients with suspected metastatic disease.

Al-Mulhim (2005) reported on the advantage of femoral marrow MRI as a non-invasive technique over bilateral iliac crest BM biopsies to detect BM infiltration before treatment and residual disease after completion of treatment in 30 NHL patients. The results showed the following: Before treatment, MRI showed BM infiltration in 17 cases (56.7%) and positive biopsy results were found in nine cases (30%). After treatment, MRI showed residual BM infiltration in six of 17 cases that had a previously positive MRI and only one case had a positive BM biopsy and all of them relapsed within six months.
January 2009 Update
No new information was located that would alter the coverage statement of this policy.

Key Words:
Magnetic resonance imaging (MRI), bone marrow blood supply, marrow reconversion, marrow infiltration or replacement, myeloid depletion, bone marrow ischemia, marrow response

Approved by Governing Bodies:
FDA approved
In 2006, the Food and Drug Administration (FDA) issued a Public Health Advisory to healthcare professionals regarding Nephrogenic Systemic Fibrosis or Nephrogenic Fibrosing Dermopathy (NSF/NFD) which may occur in patients with moderate to end-stage kidney disease after they have a MRI or Magnetic resonance angiography (MRA) with a gadolinium-based contrast agent.

First identified in 1997, NSF/NFD is almost exclusively found in patients with renal failure and acidosis. Patients with this condition develop fibrosis of the skin and connective tissues throughout the body. The skin thickening may inhibit flexion and extension of joints, resulting in contractures. In addition, patients may develop widespread fibrosis in other organs. A skin biopsy is necessary to make a definitive diagnosis. The disease is progressive and may be fatal. Its cause is unknown.

Patients who receive gadolinium-containing contrast agents should be aware of the following possible signs and symptoms of NSF/NFD and advised to seek medical attention if these occur: swelling and tightening of the skin; difficulty extending the joints of arms, hands, legs, and feet; weakness, reddened or darkened areas on the skin; burning or itching of the skin; and deep bone pain in the hips and ribs.

Physicians should be cautious regarding the use of gadolinium-containing contrast imaging agents, especially at high doses, in patients with moderate to end-stage renal failure.

Benefit Application:
Coverage is subject to member’s specific benefits. Group specific policy will supersede this policy when applicable.

ITS: Home Policy provisions apply
BellSouth/AT&T contracts: No special consideration
FEP contracts: Special benefit consideration may apply. Refer to member’s benefit plan.
Wal-Mart: Special benefit consideration may apply. Refer to member’s benefit plan.

Pre-certification requirements: Effective for dates of service on or after November 1, 2007, required when ordered by a provider in a Blue Cross and Blue Shield of Alabama’s Preferred or Participating Network for a patient covered by Blue Cross and Blue Shield of Alabama who will
receive outpatient imaging services(s) from a Preferred Medical Doctor (PMD) or Preferred Radiology Participating (PRP) provider.

**Exceptions to the Alabama PMD and PRP pre-certification requirement:** NASCO, Wal-Mart, Blue Advantage, Flowers Foods, Inc., FEP.

In addition to the above Blue Cross and Blue Shield of Alabama PMD/PRP Network requirement, some self-insured national account groups may require pre-certification for all MRIs effective for dates of service on or after January 1, 2009. Please confirm during your benefit verification process if a pre-certification is required.

Reviews to verify accuracy of pre-certification information will be conducted.

**Coding:**
CPT Codes: 77084 Magnetic resonance (e.g., proton) imaging, bone marrow blood supply

**References:**

**Policy History:**
Medical Policy Group, January 2007 (2)
Medical Policy Administration Committee, January 2007
Available for comment January 30-March 8, 2007
Medical Policy Group, December 2008 (2)  
Medical Policy Group, January 2009 (1)  
Medical Policy Group, February 2013 (2) Updated policy with link to CareCore National©  
medical policies effective April 1, 2013  
Medical Policy Administration Committee, March 2013  
Available for comment February 15 through March 31, 2013

This medical policy is not an authorization, certification, explanation of benefits, or a contract. Eligibility and benefits are determined on a case-by-case basis according to the terms of the member’s plan in effect as of the date services are rendered. All medical policies are based on (i) research of current medical literature and (ii) review of common medical practices in the treatment and diagnosis of disease as of the date hereof. Physicians and other providers are solely responsible for all aspects of medical care and treatment, including the type, quality, and levels of care and treatment.

This policy is intended to be used for adjudication of claims (including pre-admission certification, pre-determinations, and pre-procedure review) in Blue Cross and Blue Shield’s administration of plans contracts.