Clinical Policy Bulletin:
Open Air, Low Field Strength, and Positional Magnetic Resonance Imaging (MRI) Units

Number: 0093

Policy

*Please see amendment for Pennsylvania Medicaid at the end of this CPB.*

Aetna considers magnetic resonance imaging (MRI) medically necessary for appropriate indications without regard to the field strength or configuration of the MRI unit. Aetna considers intermediate and low field strength MRI units to be an acceptable alternative to standard full strength MRI units.

Aetna considers "open" MRI units of any configuration, including MRI units that allow imaging when standing (Stand-Up MRI) or when sitting, to be an acceptable alternative to standard "closed" MRI units.

Aetna considers repeat MRI scans in different positions (such as flexion, extension, rotation and lateral bending) and when done with and without weight-bearing to be experimental and investigational for all indications (including evaluation of Ehlers-Danlos syndrome, suspected craniovertebral or cervical spine abnormalities) because of insufficient evidence of this approach.

See also: CPB 0094 - Magnetic Resonance Angiography (MRA) and Magnetic Resonance Venography (MRV); CPB 0105 - Magnetic Resonance Imaging (MRI) of the Breast; CPB 0171- Magnetic Resonance Imaging (MRI) of the Extremities; CPB 0236 - Magnetic Resonance Imaging (MRI) and Computed Tomography (CT) of the Spine; CPB 0384 - Magnetic Resonance Cholangiopancreatography; CPB 0387 - Magnetic Resonance Neurography; CPB 0520 - Magnetic Resonance Imaging of the Cardiovascular System - Cardiac MRI.

Background

Dynamic (kinematic) or upright magnetic resonance imaging (MRI) purportedly provides images of the spine under daily living or weight-bearing conditions. A vertically open configuration MRI enables sitting or standing during image capture. Position changes, such as flexion and extension of the neck or back can also be viewed.

Standing MRIs (e.g., The Stand-Up™ MRI, FONAR, Melville, NY) allows patients to walk in and be scanned while standing.

Standing MRIs are equipped with a system that positions the patient in the magnet and places the anatomy of interest at the center of the magnet gap. The standing MRI can also rotate a patient from the vertical to the horizontal position so the patient can be scanned lying down. MRIs have also been
developed that can scan patients in a sitting position [Position MRI™ (pMRI™)].

The standing MRI and sitting MRI may be an alternative to open MRI for imaging someone with claustrophobia.

Standing MRIs allows the spine, joints and other parts of the body to be imaged in the weight bearing state. In theory, if one can scan the patient in a load-bearing position, one can more accurately identify the precise source of pain. The standing MRI can also image someone in various positions (e.g., flexion, extension, rotation, and lateral bending) (e.g., "flexion-extension MRI"). Currently, standing radiographs are used to examine patients in the standing position or other positions.

The clinical value of standing MRI or position MRI imaging in various positions (e.g., flexion, extension, rotation and lateral bending) has not been systematically evaluated in clinical studies. It has not been demonstrated in published prospective clinical studies that performing MRIs in these various positions can consistently detect problems that cannot be detected with a standard MRI.

An assessment of standing, weight-bearing, positional, and upright MRIs by the Washington State Department of Labor and Industries (2006) concluded: "There is limited scientific data available on the accuracy and diagnostic utility of standing, upright, weight-bearing or positional MRI. Well-designed clinical trials are necessary to effectively determine the potential benefits and value of this diagnostic imaging method. . . . Due to the lack of evidence addressing diagnostic accuracy or diagnostic utility, standing, weight-bearing, positional magnetic resonance imaging is considered investigational and experimental".

Supported by findings of a technology assessment of upright, positional and weight-bearing MRIs (Skelly et al, 2007), the Washington State Health Care Authority found that "there was insufficient scientific evidence to make any conclusions about uMRI’s effectiveness, including whether uMRI accurately identifies an appropriate diagnosis; can safely and effectively replace other tests; or results in equivalent or better diagnostic or therapeutic outcomes”.

Diefenbach et al (2013) examined if an upright positional MRI protocol could produce reliable spinal curvature images and measurements compared with traditional radiograph. A total of 25 consecutive patients (16 females; 9 males; average age of 14.6 yrs; range of 12 to 18) with a diagnosis of adolescent idiopathic scoliosis (AIS) were enrolled in this study. Average major curve magnitude was 30° (range of 6 to 70). Subjects received anterior-posterior as well as lateral plain radiographical scoliosis imaging followed within 1 week by uMRI; MRI data acquisition was performed in less than 7 mins. Two independent observers performed all Cobb angle, T5-T12 kyphosis, and vertebral rotation measurements for comparison. The Pearson correlation method was performed to compare radiograph to uMRI measurements, while inter-rater and intra-rater correlations were performed to assess reliability. These investigators found outstanding correlation between all plain film radiography and uMRI measurements (p = 0.01); major Cobb angles (R = 0.901), minor Cobb angles (R = 0.838), and kyphosis (R = 0.943). Inter-rater reliability for both radiographical and MRI measurements of major Cobb angles (R = 0.959, 0.896, respectively), minor Cobb angles (R = 0.951, 0.857, respectively), and vertebral rotation (R = 0.945) were outstanding. Intra-rater reliability for both radiographical and MRI measurements of major Cobb angles (R = 0.966, 0.966, respectively) and minor Cobb angles (R = 0.945, 0.943, respectively) were also outstanding. The authors concluded that these results showed that uMRI is capable of producing coronal and sagittal plane measurements that highly correlate with traditional plain film radiographical measurements. This, in addition to reliable vertebral rotation measurements, makes uMRI a valuable, radiation-free alternative/substitute for diagnostic evaluation in AIS.

**Positional MRI for Ehlers-Danlos Syndrome / Suspected Cranio-Vertebral or Cervical Spine Abnormalities:**

Health Quality Ontario’s evidence-based analysis on “Positional magnetic resonance imaging for people with Ehlers-Danlos syndrome or suspected craniovertebral or cervical spine abnormalities”
Ehlers-Danlos syndrome (EDS) is an inherited disorder affecting the connective tissue. Ehlers-Danlos syndrome can manifest with symptoms attributable to the spine or cranio-vertebral junction (CVJ). In addition to EDS, numerous congenital, developmental, or acquired disorders can increase ligamentous laxity in the CVJ and cervical spine. Resulting abnormalities can lead to morbidity and serious neurologic complications. Appropriate imaging and diagnosis is needed to determine patient management and need for complex surgery. Some spinal abnormalities cause symptoms or are more pronounced while patients sit, stand, or perform specific movements. Positional MRI (pMRI) allows imaging of the spine or CVJ with patients in upright, weight-bearing positions and can be combined with dynamic maneuvers, such as flexion, extension, or rotation. Imaging in these positions could allow diagnosticians to better detect spinal or CVJ abnormalities than recumbent MRI or even a combination of other available imaging modalities might allow. These investigators determined the diagnostic impact and clinical utility of pMRI for the assessment of (i) cranio-vertebral or spinal abnormalities among individuals with EDS and (ii) major cranio-vertebral or cervical spine abnormalities among symptomatic persons. A literature search was performed using Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid Embase, and EBM Reviews, for studies published from January 1, 1998, to September 28, 2014. Studies comparing pMRI to recumbent MRI or other available imaging modalities for diagnosis and management of spinal or CVJ abnormalities were reviewed. All studies of spinal or CVJ imaging in persons with EDS were included as well as studies among individuals with suspected major CVJ or cervical spine abnormalities (cervical or cranio-vertebral spine instability, basilar invagination, cranial settling, cervical stenosis, spinal cord compression, Chiari malformation). No studies were identified that met the inclusion criteria. The authors did not identify any evidence that assessed the diagnostic impact or clinical utility of pMRI for (i) cranio-vertebral or spinal abnormalities among individuals with EDS, or (ii) major cranio-vertebral or cervical spine abnormalities among symptomatic persons relative to currently available diagnostic modalities.

CPT Codes / HCPCS Codes / ICD-10 Codes

Information in the [brackets] below has been added for clarification purposes. Codes requiring a 7th character are represented by "+".

CPT codes covered if selection criteria are met:

- 70551 - 70553: Magnetic resonance (e.g., proton) imaging, brain (including brain stem); without contrast material, with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences
- 70554 - 70555: Magnetic resonance imaging, brain, functional MRI
- 72141 - 72142, 72156: Magnetic resonance (eg, proton) imaging, spinal canal and contents, cervical; without contrast material(s), with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences [Not covered for repeat MRI scans in different positions]
- 72195 - 72197: Magnetic resonance (e.g., proton) imaging, pelvis; without contrast material(s), with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences
- 73218 - 73223: Magnetic resonance (e.g., proton) imaging, upper extremity, other than joint; without contrast material(s), with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences
- 73718 - 73723: Magnetic resonance (e.g., proton) imaging, lower extremity other than joint; without contrast material(s), with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences
material(s), followed by contrast material(s) and further sequences

74181 - 74183 Magnetic resonance (e.g., proton) imaging, abdomen; without contrast material(s), with contrast material(s), or without contrast material(s), followed by contrast material(s) and further sequences

**HCPCS code covered if selection criteria are met:**

S8042 Magnetic resonance imaging (MRI), low-field

**ICD-10 codes covered if selection criteria are met:**

Too many to list

**ICD-10 codes not covered for indications listed in the CPB:**

M48.02 Spinal stenosis, cervical region
M50.00 - M50.03 Cervical disc disorder with myelopathy
M50.10 - M50.13 Cervical disc disorder with radiculopathy
M50.20 - M50.23 Other cervical disc displacement
M50.30 - M50.33 Other cervical disc degeneration
M50.80 - M50.83 Other cervical disc disorders
M50.90 - M50.93 Cervical disc disorder, unspecified
Q79.6 Ehlers-Danlos syndrome

**The above policy is based on the following references:**


26. Hailey D. Open magnetic resonance imaging (MRI) scanners. Issues in Emerging Health Technologies. Issue 92. Ottawa, ON; Canadian Agency for Drugs and Technologies in Health (CADTH); 2006.


Amendment to
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There are no amendments for Medicaid.