

Medical and Behavioral Health Policy Manual

Section: Radiology

Policy Number: V-13

Effective Date: 09/28/2011

MAGNETOENCEPHALOGRAPHY / MAGNETIC SOURCE IMAGING

Description: Magnetoencephalography (MEG) is a noninvasive functional imaging technique in which the weak magnetic forces associated with the electrical activity of the brain are recorded externally. Using mathematical modeling, the recorded data are then analyzed to provide an estimated location of the electrical activity. This information can be superimposed on an anatomic image of the brain, typically a magnetic resonance imaging (MRI) scan, to produce a functional / anatomic image of the brain, referred to as magnetic source imaging or MSI. The primary advantage of MSI is that while the conductivity and, therefore, measurement of electrical activity as recorded by the electro-encephalogram (EEG) is altered by surrounding brain structures, the magnetic fields are not. Therefore, MSI permits a high-resolution image.

Several clinical applications have been investigated for the use of MEG / MSI. The first of these is localization of the pre- and postcentral gyri as a guide to surgical planning in patients scheduled to undergo neurosurgery for epilepsy, brain neoplasms, arteriovenous malformations, or other brain disorders. These gyri contain the "eloquent" sensorimotor areas of the brain, the preservation of which is considered critical during any type of brain surgery. In normal situations, these areas can be identified anatomically by MRI, but frequently the anatomy is distorted by underlying disease processes. In addition, the location of the eloquent functions is variable, even among healthy patients. Therefore, localization of the eloquent cortex often requires such intraoperative invasive functional techniques as cortical stimulation with the patient under local anesthesia or somatosensory-evoked responses on electrocorticography (ECoG). While these techniques can be done at the same time as the planned resection, they are cumbersome and can add up to 45 minutes of anesthesia time. Furthermore, sometimes these techniques can be limited by the small surgical field. A preoperative test, which is often used to localize the eloquent hemisphere, is the Wada test. MEG/MSI has been proposed as a substitute for the Wada test.

Another related clinical application is localization of epileptic foci, particularly for screening of surgical candidates and surgical planning. Alternative techniques include MRI, positron emission tomography

(PET), or single photon emission computed tomography (SPECT) scanning. Anatomic imaging (i.e., MRI) is effective when epilepsy is associated with a mass lesion, such as a tumor, vascular malformation, or hippocampal atrophy. If an anatomic abnormality is not detected, patients may undergo a PET scan. In a small subset of patients, extended electrocorticography (EcoG) or stereotactic electroencephalography EEG (SEEG) with implanted electrodes is considered the gold standard for localizing epileptogenic foci. MEG/MSI has principally been investigated as a supplement to or an alternative to invasive monitoring.

- Policy:** Magnetoencephalography / magnetic source imaging (MEG / MSI) may be considered **MEDICALLY NECESSARY** when used for the following indications:
- Mapping of the eloquent cortex (e.g., visual, sensory, language, or motor) in patients being prepared for surgery for epilepsy, brain tumors, arteriovenous malformations, or other indications requiring brain resection; or
 - Localization of the epileptic lesion foci in patients with medically refractory epilepsy who are being considered for surgery.

Magnetoencephalography / magnetic source imaging (MEG / MSI) is considered **INVESTIGATIVE** for all other indications.

Coverage: **Pre-Certification/Pre-Authorization: No.**

However, services with specific coverage criteria may be reviewed retrospectively to determine if criteria are being met. Retrospective denial may result if criteria are not met.

Coding: *The following codes are included below for informational purposes only, and are subject to change without notice. Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement.*

CPT:

95965 Magnetoencephalography (MEG), recording and analysis; for spontaneous brain magnetic activity (e.g., epileptic cerebral cortex localization)

95966 Magnetoencephalography (MEG), recording and analysis; for evoked magnetic fields, single modality (e.g., sensory, motor, language, or visual cortex localization)

95967 Magnetoencephalography (MEG), recording and analysis; for evoked magnetic fields, each additional modality (e.g., sensory, motor, language, or visual cortex localization) (List separately in addition to code for primary procedure)

HCPCS:

S8035 Magnetic source imaging

ICD-9 Diagnosis:

- 191.0 Malignant neoplasm of brain; Cerebrum, except lobes and ventricles
- 191.1 Malignant neoplasm of brain; Frontal lobe
- 191.2 Malignant neoplasm of brain; Temporal lobe
- 191.3 Malignant neoplasm of brain; Parietal lobe
- 191.4 Malignant neoplasm of brain; Occipital lobe
- 191.5 Malignant neoplasm of brain; Ventricles
- 191.6 Malignant neoplasm of brain; Cerebellum NOS
- 191.7 Malignant neoplasm of brain; Brain stem
- 191.8 Malignant neoplasm of brain; Other parts of brain
- 191.9 Brain, unspecified
- 239.6 Neoplasm of unspecified nature of brain
- 345.00 Generalized nonconvulsive epilepsy without mention of intractable epilepsy
- 345.01 Generalized nonconvulsive epilepsy with intractable epilepsy
- 345.10 Generalized convulsive epilepsy without mention of intractable epilepsy
- 345.11 Generalized convulsive epilepsy with intractable epilepsy
- 345.2 Petit mal status
- 345.3 Grand mal status
- 345.40 Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, without mention of intractable epilepsy
- 345.41 Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy
- 345.50 Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, without mention of intractable epilepsy
- 345.51 Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy
- 345.60 Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy
- 345.61 Infantile spasms with intractable epilepsy
- 345.70 Epilepsia partialis continua without mention of intractable epilepsy
- 345.71 Epilepsia partialis continua with intractable epilepsy
- 345.80 Other forms of epilepsy and recurrent seizures, without mention of intractable epilepsy
- 345.81 Other forms of epilepsy and recurrent seizures, with intractable epilepsy
- 345.90 Unspecified epilepsy without mention of intractable epilepsy
- 345.91 Unspecified epilepsy with intractable epilepsy
- 437.3 Cerebral aneurysm, nonruptured

747.81 Anomalies of cerebrovascular system

**Policy
History:**

**Medical and Behavioral Health
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Reviewed September 8, 2010
Reviewed September 14, 2011

Medical Policy

Committee Review:

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Reviewed November 14, 2007

**Cross
Reference:**

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