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Reviewed: 07/23/26

Revised: 08/15/26

Subject: Magnetoencephalography/Magnetic Source Imaging

THIS MEDICAL COVERAGE GUIDELINE IS NOT AN AUTHORIZATION, CERTIFICATION, EXPLANATION OF BENEFITS, OR A GUARANTEE OF PAYMENT, NOR DOES IT SUBSTITUTE FOR OR CONSTITUTE MEDICAL ADVICE. ALL MEDICAL DECISIONS ARE SOLELY THE RESPONSIBILITY OF THE PATIENT AND PHYSICIAN. BENEFITS ARE DETERMINED BY THE GROUP CONTRACT, MEMBER BENEFIT BOOKLET, AND/OR INDIVIDUAL SUBSCRIBER CERTIFICATE IN EFFECT AT THE TIME SERVICES WERE RENDERED. THIS MEDICAL COVERAGE GUIDELINE APPLIES TO ALL LINES OF BUSINESS UNLESS OTHERWISE NOTED IN THE PROGRAM EXCEPTIONS SECTION.

Position Statement	Billing/Coding	Reimbursement	Program Exceptions	Definitions	Related Guidelines
Other	References	Updates			

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. The recorded data are 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 (MSI). This technique has been studied for identifying “eloquent” areas of the brain for neurosurgical planning and for use in localization of epileptic foci.

Using mathematical modeling, the recorded data from MEG are analyzed to provide an estimated location of the electrical activity. The primary advantage of MSI is that while the conductivity and thus the measurement of electrical activity as recorded by the electroencephalogram (EEG) is altered by surrounding brain structures, the magnetic fields are not. Therefore, MSI permits a high-resolution image.

Summary and Analysis of Evidence: According to the American Academy of Neurology Magnetoencephalography (MEG) (2009) Magnetoencephalography (MEG), also known as Magnetic Source Imaging (MSI) is the noninvasive measurement of the magnetic fields generated by brain activity. Typical MEG recordings are made within a magnetically shielded room using a device that has 100 to 300 magnetometers or gradiometers (sensors). They are arranged in a helmet-shaped container called a Dewar. The Dewar is filled with liquid helium needed to produce superconductivity. The brain sources producing the magnetic field maps can be easily mapped and displayed on a coregistered MRI. This results in a visual display of normal brain activity such as the location of eloquent cortex for vision, touch, movement, or language. It displays equally well abnormal brain activity such as epileptic discharges. Such depictions are useful in pre-surgical brain mapping in patients with epilepsy, brain tumors, and vascular malformations. Indications: Epilepsy – Pre-surgical evaluation in patients with intractable focal epilepsy to identify and localize area(s) of epileptiform activity. MEG can be valuable when discordance or continuing questions arise from amongst other techniques designed. Tumors and AVM Surgeries – Pre-surgical evaluation of brain tumors and vascular malformations. The aim is to identify, localize and preserve eloquent cortex during resective surgery.

POSITION STATEMENT:

Magnetoencephalography/magnetic source imaging **meets the definition of medical necessity** for the purpose of determining the laterality of language function, as a substitute for the Wada test, in members undergoing diagnostic workup for evaluation of surgery for epilepsy, brain tumors, and other indications requiring brain resection.

Magnetoencephalography/magnetic source imaging as part of the preoperative evaluation of members with drug-resistant epilepsy **meets the definition of medically necessary** when standard techniques, such as magnetic resonance imaging (MRI) and electroencephalography (EEG), do not provide satisfactory localization of epileptic lesion(s).

Magnetoencephalography/magnetic source imaging is considered **experimental or investigational** for all other indications. The evidence is insufficient to determine magnetoencephalography/magnetic source imaging on health outcomes.

BILLING/CODING INFORMATION:

CPT Coding:

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 Coding:

S8035	Magnetic source imaging

REIMBURSEMENT INFORMATION:

Refer to section entitled **POSITION STATEMENT**.

PROGRAM EXCEPTIONS:

Federal Employee Program (FEP): Follow FEP guidelines.

State Account Organization (SAO): Follow SAO guidelines.

Medicare Advantage products: No National Coverage Determination (NCD) and/or Local Coverage Determination (LCD) were found at the time of the last guideline reviewed date.

If this Medical Coverage Guideline contains a step therapy requirement, in compliance with Florida law 627.42393, members or providers may request a step therapy protocol exemption to this requirement if based on medical necessity. The process for requesting a protocol exemption can be found at Coverage Protocol Exemption Request.

DEFINITIONS:

No guideline specific definitions apply.

RELATED GUIDELINES:

None applicable.

OTHER:

None applicable.

REFERENCES:

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3. Blue Cross Blue Shield Association Tec Special Report: MEG and MSI for the Purpose of Presurgical Localization of Epileptic Lesions-A Challenge for Technology Evaluation, Volume 23, No. 8 January 2008.
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8. Knowlton RC, Elgavish RA, Bartolucci A, Ojha B, Limdi N, Blount J, Burneo JG, Ver Hoef L, Paige L, Faught E, Kankirawatana P, Riley K, Kuzniecky R. Functional imaging: II. Prediction of epilepsy surgery outcome. Ann Neurol. 2008 Jul; 64(1): 35-41.
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10. Schneider F, Irene Wang Z, Alexopoulos AV et al. Magnetic source imaging and ictal SPECT in MRI-negative neocortical epilepsies: additional value and comparison with intracranial EEG. Epilepsia. 2013 Feb;54(2):359-369.
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13. Tarapore PE, Tate MC, Findlay AM et al. Preoperative multimodal motor mapping: a comparison of magnetoencephalography imaging, navigated transcranial magnetic stimulation, and direct cortical stimulation. Journal of Neurosurgery. 2012 Aug;117(2):354-362.
14. Vates GE, Lawton MT, Wilson CB et al. Magnetic source imaging demonstrates altered cortical distribution of function in patients with arteriovenous malformations. Neurosurgery 2002; 51(3): 614-623; discussion 623-627.
15. Verrotti A, Pizzella V, Trotta D et al. Magnetoencephalography in pediatric neurology and in epileptic syndromes. Pediatric Neurology 2003 Apr; 28(4): 253-261.
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COMMITTEE APPROVAL:

This Medical Coverage Guideline (MCG) was approved by the Florida Blue Medical Policy and Coverage Committee on 07/23/26.

GUIDELINE UPDATE INFORMATION:

09/01/01	Medical Coverage Guideline Reformatted.
01/01/02	HCPCS update with coding changes.
03/15/02	Revision of guideline added Program Exception for Medicare and More.
04/15/03	Review of guideline; no change in coverage statement.
04/15/04	Review and revision of guideline; consisting of updated references and no change in investigational statement.
04/15/05	Review and revision of guideline consisting of updated references.
04/15/06	Review and revision of guideline consisting of updated references.
04/15/07	Review and revision of guideline consisting of updated references.
06/15/07	Reformatted guideline.
03/15/08	Review and revision of guideline consisting of updated references.
03/15/09	Review and revision of guideline consisting of updated references.
03/15/10	Scheduled review. No change in position statement (experimental or investigational). Updated description and references. Deleted related Internet links.
12/15/11	Updated description and position statement; add medical necessity statement for intractable epilepsy. Revised experimental or investigational position statement. Updated references.
05/11/14	Revision: Program Exceptions section updated.
08/15/18	Review; revised position statement. Updated references.
06/15/20	Review; no change to position statement. Updated references.
08/15/22	Review; no change to position statement.
05/22/23	Update to Program Exceptions section.
08/15/24	Review; no change to position statement.
08/15/25	Review; no change to position statement.
08/15/26	Review; no change to position statement.