

Table of Contents

1.0	Description of the Procedure, Product, or Service.....	1
1.1	Medical Term Definitions.....	2
2.0	Eligible Recipients.....	2
2.1	General Provisions.....	2
3.0	When the Procedure, Product, or Service Is Covered.....	2
3.1	General Criteria.....	2
3.2	Specific Criteria.....	2
3.3	Policy Guidelines.....	2
4.0	When the Procedure, Product, or Service Is Not Covered.....	3
4.1	General Criteria.....	3
4.2	Specific Criteria.....	3
5.0	Requirements for and Limitations on Coverage.....	3
5.1	Prior Approval.....	3
6.0	Providers Eligible to Bill for the Procedure, Product, or Service.....	3
7.0	Additional Requirements.....	4
7.1	Compliance.....	4
8.0	Policy Implementation/Revision Information.....	4
	Attachment A: Claims-Related Information.....	5
A.	Claim Type.....	5
B.	Diagnosis Codes.....	5
C.	Procedure Code(s).....	5
D.	Modifiers.....	5
E.	Billing Units.....	5
F.	Place of Service.....	5
G.	Co-payments.....	5
H.	Reimbursement.....	5

1.0 Description of the Procedure, Product, or Service

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 on the scalp. 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 (MSI). The primary advantage of MSI is that while the conductivity and thus 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.

This technique is sophisticated. Detection of the weak magnetic fields depends on gradiometer detection coils coupled to a superconducting quantum interference device (SQUID) which requires a specialized room shielded from other magnetic sources. Mathematical modeling programs based on idealized assumptions are then used to translate the detected signals into functional images.

One clinical application is localization of the pre- and postcentral gyri as a guide to surgical planning in recipients 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 recipients. Therefore, localization of the eloquent cortex often requires such intraoperative invasive functional techniques as cortical stimulation with the recipient under local anesthesia or somatosensory-evoked responses on electrocorticography. 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. Alternate techniques include MRI, PET or SPECT scanning. Anatomic imaging 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, recipients may undergo a PET scan. In a small subset of recipients, extended electrocorticography or stereotactic magnetoencephalography 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.

1.1 Medical Term Definitions

Wada test: Unilateral internal carotid injection of amobarbital to determine the laterality of speech; injection on the dominant side causes transient aphasia or mutism; used prior to surgical treatment of epilepsy.

2.0 Eligible Recipients

2.1 General Provisions

To be eligible, NCHC recipients must be enrolled on the date of service.

3.0 When the Procedure, Product, or Service Is Covered

3.1 General Criteria

NCHC covers procedures, products, and services related to this policy when they are medically necessary and

- a. the procedure, product, or service is individualized, specific, and consistent with symptoms or confirmed diagnosis of the illness or injury under treatment, and not in excess of the recipient's needs;
- b. the procedure, product, or service can be safely furnished, and no equally effective and more conservative or less costly treatment is available; **AND**
- c. the procedure, product, or service is furnished in a manner not primarily intended for the convenience of the recipient, the recipient's caretaker, or the provider.

3.2 Specific Criteria

Magnetoencephalography and magnetic source imaging are covered under the NC Health Choice Program when they are determined to be medically necessary:

- a. for the purpose of determining the laterality of language function;
- b. as a substitute for the Wada test; or
- c. in recipients undergoing diagnostic workup for evaluation of surgery for epilepsy, brain tumors, and other indications requiring brain resection.

3.3 Policy Guidelines

a. Localization of Seizure Focus

Based on a 2008 review, MEG for the purpose of seizure localization is considered investigational. Numerous studies have shown associations between MEG findings and other noninvasive and invasive diagnostic tests and between MEG findings and surgical outcomes, however, such studies do not allow any conclusions regarding whether MEG added incremental information to aid the management of such patients, and whether patients' outcomes were improved as a result of the additional diagnostic information. Deficiencies in the literature, primarily due to the fact that

studies have ascertainment and selection biases because MEG findings were used to select and deselect patients in the diagnostic pathway, make it difficult to determine whether use of MEG or the purpose of seizure localization improved recipient outcomes.

b. Localization of Eloquent and Sensorimotor Areas

Several studies have shown high concordance between the Wada test and MEG. Preoperative mapping by MEG might aid in determining the suitability of the patient for surgery, or for assisting in the planning of other invasive testing. Similar to the situation for localization of epilepsy focus, the literature is problematic in terms of evaluating the comprehensive outcomes of patients due to ascertainment and selection biases. Studies tend to be limited to correlations between MEG and intraoperative mapping. Several of the studies evaluated in 2003 showed a good to high concordance between MEG findings and intraoperative mapping.

4.0 When the Procedure, Product, or Service Is Not Covered

4.1 General Criteria

Procedures, products, and services related to this policy are not covered when

- a. the recipient does not meet the eligibility requirements listed in **Section 2.0**;
- b. the recipient does not meet the medical necessity criteria listed in **Section 3.0**;
- c. the procedure, product, or service unnecessarily duplicates another provider's procedure, product, or service; or
- d. the procedure, product, or service is experimental or investigational.

4.2 Specific Criteria

Magnetoencephalography and magnetic source imaging are considered investigational for all other indications, including localization of seizure focus for recipients undergoing evaluation for surgical treatment of intractable seizures

5.0 Requirements for and Limitations on Coverage

5.1 Prior Approval

Prior approval is not required for Magnetoencephalography and magnetic source imaging.

6.0 Providers Eligible to Bill for the Procedure, Product, or Service

To be eligible to bill for procedures, products, and services related to this policy, providers shall

- a. meet NCHC qualifications for participation;
- b. be currently enrolled with NCHC; **AND**

- c. bill only for procedures, products, and services that are within the scope of their clinical practice, as defined by the appropriate licensing entity.

7.0 Additional Requirements

7.1 Compliance

Providers must comply with all applicable federal, state, and local laws and regulations, including the Health Insurance Portability and Accountability Act (HIPAA) and record retention requirements.

8.0 Policy Implementation/Revision Information

Original Effective Date: July 1, 2010

Revision Information:

Date	Section Revised	Change
July 1, 2010		Policy Conversion: Implementation of Session Law 2009-451, Section 10.32 "NC HEALTH CHOICE/PROCEDURES FOR CHANGING MEDICAL POLICY."
September 30, 2011	Throughout	Policy Date of Termination

Attachment A: Claims-Related Information

Reimbursement requires compliance with all NCHC guidelines.

A. Claim Type

Professional (CMS-1500/837P transaction)

Institutional (UB-04/837I transaction)

B. Diagnosis Codes

Providers must bill the ICD-9-CM diagnosis codes(s) to the highest level of specificity that supports medical necessity.

C. Procedure Code(s)

CPT Codes
95965
95966
+95967

HCPCS Codes
S8035

D. Modifiers

Providers are required to follow applicable modifier guidelines.

E. Billing Units

The appropriate procedure code(s) used determines the billing unit(s).

F. Place of Service

Inpatient Hospital, Outpatient Hospital and Office

G. Co-payments

Co-payment(s) may apply to covered prescriptions and services.

H. Reimbursement

Providers must bill their usual and customary charges.