



# CIGNA MEDICAL COVERAGE POLICY

The following Coverage Policy applies to all plans administered by CIGNA Companies including plans administered by Great-West Healthcare, which is now a part of CIGNA.

**Subject Intracranial  
Electroencephalography  
(IEEG)**

**Effective Date ..... 11/15/2009**  
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**Coverage Policy Number ..... 0237**

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## Hyperlink to Related Coverage Policies

Magnetoencephalography (MEG)  
 Quantitative Electroencephalography (QEEG)  
 Vagus Nerve Stimulation (VNS)  
 Video Electroencephalography (V-EEG) Monitoring

### INSTRUCTIONS FOR USE

Coverage Policies are intended to provide guidance in interpreting certain **standard** CIGNA HealthCare benefit plans as well as benefit plans formerly administered by Great-West Healthcare. Please note, the terms of a participant's particular benefit plan document [Group Service Agreement (GSA), Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a participant's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a participant's benefit plan document **always supercedes** the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable group benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. Proprietary information of CIGNA. Copyright ©2009 CIGNA

## Coverage Policy

**CIGNA covers intracranial electroencephalography (IEEG) monitoring as medically necessary for the identification and localization of intractable seizure foci when ALL of the following criteria are met:**

- Other possible causes of seizure-like activity (i.e., migraines, syncope, transient ischemic attacks [TIAs], tumors and organic brain syndromes) have been eliminated.
- Optimal medical management has failed to control the seizure disorder.
- Surface, video, and/or quantitative electroencephalography and neurological imaging studies have not conclusively located a focal area of seizure activity.
- Surgery is planned.

## General Background

Epilepsy is a general term that includes various types of seizures. In general, individuals with diagnosed epilepsy have experienced more than one seizure, and they may have had more than one type of seizure. A seizure happens when abnormal electrical activity in the brain causes an involuntary change in body movement or function, sensation, awareness, or behavior. Despite advances in the treatment of epilepsy, many patients experience seizure activity that is refractory to optimal medical management. The underlying cause of this seizure activity may be determined through the use of the following diagnostic tests:

- surface EEG
- video EEG
- quantitative EEG
- brain magnetic resonance imaging (MRI)
- positron emission tomography (PET) or single photon emission computed tomography (SPECT) scan of the brain
- neuropsychological exam
- neurofunctional exam (e.g., Wada test [children > 5 years old])
- possible lumbar puncture to rule out encephalitis or meningitis
- routine blood work, including a drug screening
- detailed history and physical (Bazil, 2005; Spencer, 2003; Engel, 2003; Shneker, 2003)

Patients who are considered strong surgical candidates may be referred for an intracranial electroencephalography (IEEG) when all noninvasive diagnostic studies have failed to determine the specific focal location of the seizure activity.

### **Intracranial electroencephalography (IEEG)**

IEEG recording is used for accurate detection of the specific epileptogenic area of the brain responsible for initiating seizure activity. The precise localization of this area is vital to the successful outcome of seizure surgery in carefully selected patients. An IEEG is obtained by placing a strip or grid of electrodes in the subdural space via a craniotomy (for grids) or under fluoroscopy through burr holes (for strips). EEG recording (i.e., electrocorticography [ECoG]) and electrical stimulation (i.e., functional mapping) can be performed by way of these electrodes. Functional mapping plays an important role in neocortical resections. Defining the relationship between the eloquent cortex and the epileptogenic zone is necessary for understanding the risks and potential benefits of surgical resection.

An IEEG can be performed via a one-stage or two-stage approach. During a one-stage approach, mapping is obtained in the operating room. Once the epileptogenic area of the brain is identified, surgical resection can begin. One of the major advantages of this approach is the ability to interact with the adult patient in a nonsedated state while mapping the eloquent cortex. During the two-stage approach, subdural electrodes are placed during the initial operation; the patient is then moved to a monitoring unit. Seizure activity is monitored, recorded and analyzed to determine specifically where to perform surgical resection of the ictal onset zone. This approach is advantageous when the epileptogenic zone is discrete, lesions are not clear on imaging films, or the zone that needs resection is adjacent to the eloquent cortex (Cossu, 2006; Bazil, 2005; Hoff, 1999).

Patient selection criteria for IEEG include:

- Patients who have intractable seizures, even after administration of therapeutic levels of anti-epileptic pharmaceuticals.
- Mono- and polytherapeutic trials of medications have been attempted (i.e., a minimum of two at maximum-tolerated doses).
- Diagnostic studies have not been able to determine the specific type of epilepsy (i.e., surface EEG, video EEG, radiological studies).
- Diagnostic studies have not adequately localized or lateralized the origin of seizure activity (i.e., EEGs, radiological studies).
- The medical evaluation shows seizure activity arising from various locations in the brain, including the functional cortex (Bazil, 2005; Chapell, 2003; Sheth, 2002; Goldman, 2000).

This invasive procedure is not without risks. Complications of depth and subdural electrodes include hemorrhage, infection and cerebral edema in 1%–2% of patients. With the advances that have increased the sensitivity of MRI in detecting anatomical lesions that can cause intractable epilepsy, the need for an IEEG has decreased dramatically (Sheth, 2002).

### **Literature Review**

There is some evidence in the form of case series and a randomized controlled trial to support the use of IEEG (Knowlton, et al., 2006; Kelley and Theodore, 2005; Asano, et al., 2004; Spencer, et al., 2003; Wiebe, et al., 2001). Although accuracy data are lacking, IEEG has evolved into the standard of care for a subset of patients

who are candidates for epilepsy surgery. IEEG is the established gold standard for defining epileptogenic zones prior to surgical intervention (Blue Cross Blue Shield Association [BCBSA], Technology Evaluation Center [TEC], 2009; Muzik, et al., 2005). More sensitive than surface EEG, this technique allows for the recording of multiple regions over one or both hemispheres and mapping of the eloquent cortex (Foldvary-Schaefer and Wyllie, 2007).

### Professional Societies/Organizations

The American Academy of Neurology (AAN) has no specific position statement on the use of IEEG.

### Summary

The surgical goal in treating epilepsy is to completely resect the epileptogenic zone, while preserving the functional cortex of the brain. Through intracranial electroencephalography (IEEG) mapping, using grids or strips, the potential for success and risk of acquiring a neurological or functional deficit as a result of surgery may be predicted. When outpatient, long-term monitoring and other diagnostic studies are inconclusive or discordant with the patient's seizure activity, or when the patient is being evaluated for surgical resection of the epileptic zone, IEEG mapping may be necessary.

## Coding/Billing Information

**Note:** This list of codes may not be all-inclusive.

**Covered when medically necessary:**

CPT <sup>®*</sup> Codes	Description
61531	Subdural implantation of strip electrodes through one or more burr or trephine hole(s) for long term seizure monitoring
61533	Craniotomy with elevation of bone flap; for subdural implantation of an electrode array, for long term seizure monitoring
61760	Stereotactic implantation of depth electrodes into the cerebrum for long term seizure monitoring
61850	Twist drill or burr hole(s) for implantation of neurostimulator electrodes, cortical
61860	Craniectomy or craniotomy for implantation of neurostimulator electrodes, cerebral, cortical
61870	Craniectomy for implantation of neurostimulator electrodes, cerebellar; cortical
61875	Craniectomy for implantation of neurostimulator electrodes, cerebellar; subcortical
95961	Functional cortical and subcortical mapping by stimulation and/or recording of electrodes on brain surface, or of depth electrodes, to provoke seizures or identify vital brain structures; initial hour of physician attendance
95962	Functional cortical and subcortical mapping by stimulation and/or recording of electrodes on brain surface, or of depth electrodes, to provoke seizures or identify vital brain structures; each additional hour of physician attendance (List separately in addition to code for primary procedure)

ICD-9-CM Diagnosis Codes	Description
345.01	Generalized nonconvulsive epilepsy with intractable epilepsy
345.11	Generalized convulsive epilepsy with intractable epilepsy
345.41	Localization-related (focal) (partial) epilepsy and epileptic syndromes with complex partial seizures, with intractable epilepsy
345.51	Localization-related (focal) (partial) epilepsy and epileptic syndromes with simple partial seizures, with intractable epilepsy
345.61	Infantile spasms with intractable epilepsy
345.71	Epilepsia partialis continua with intractable epilepsy

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## Policy History

<u>Pre-Merger Organizations</u>	<u>Last Review Date</u>	<u>Policy Number</u>	<u>Title</u>
CIGNA HealthCare	11/15/2007	0237	Intracranial Electroencephalography (IEEG)

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