Ambulatory and Video Electroencephalography (EEG) for Epilepsy

Policy Number: HS-005

Original Effective Date: 12/6/2007


APPLICATION STATEMENT

The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any.

Clinical Coverage Guideline
DISCLAIMER

The Clinical Coverage Guideline is intended to supplement certain standard WellCare benefit plans. The terms of a member’s particular Benefit Plan, Evidence of Coverage, Certificate of Coverage, etc., may differ significantly from this Coverage Position. For example, a member’s benefit plan may contain specific exclusions related to the topic addressed in this Clinical Coverage Guideline. When a conflict exists between the two documents, the Member’s Benefit Plan always supersedes the information contained in the Clinical Coverage Guideline. Additionally, Clinical Coverage Guidelines relate exclusively to the administration of health benefit plans and are NOT recommendations for treatment, nor should they be used as treatment guidelines. The application of the Clinical Coverage Guideline is subject to the benefit determinations set forth by the Centers for Medicare and Medicaid Services (CMS) National and Local Coverage Determinations and state-specific Medicaid mandates, if any. Note: Lines of business (LOB) are subject to change without notice; current LOBs can be found at www.wellcare.com – select the Provider tab, then “Tools” and “Clinical Guidelines”.

BACKGROUND

Video electroencephalography (V-EEG) involves video recording a patient while simultaneously recording their EEG, usually over a period of some days. This allows correlation of a video-recorded seizure with any abnormal electrical discharge in the brain, demonstrating an epileptic or non-epileptic basis for the seizure. V-EEG is most often used to clarify an epileptic diagnosis, to differentiate between epilepsy and non-epileptic seizures, or for detailed pre-surgical evaluation for intractable epilepsy. The technique may be especially useful in children who cannot always adequately describe the subjective symptoms used by the clinician to differentiate seizure types. A member will have scalp electrodes connected to a lightweight box that can be worn while moving around and ultimately this box transmits the EEG recordings to a computer network via either wireless or cable systems. The computer systems can have inbuilt seizure detection software, and staff or family members can also press an event button to indicate a seizure, to facilitate comparison of the video with EEG trace. Various means are often employed to increase the chances of observing a seizure during the V-EEG recording, including withdrawing anticonvulsant medication, sleep deprivation, or saline injections in cases of suspected psychologic (or psychogenic) seizures. Inpatient procedures allow for more data collection and direct medical supervision.

Ambulatory electroencephalography EEG (A-EEG) cassette monitoring was developed as an extension of the routine EEG examination. The member maintains a normal routine, while wearing a monitoring system. A portable cassette recorder is used to continuously record brain wave patterns. This method allows the clinician to observe the member’s EEG activity in multiple states, such as sleeping, waking and normal daily activities. The member or caregiver uses a button to mark the recording in order to indicate when an event occurred. The information provided may allow the clinician to identify the seizure type. This method may also provide reliable data for evaluating patients with suspected non-epileptic events, such as syncope, transient ischemic attacks, pseudoseizures and poorly defined seizure disorders.1

The goal length of stay for V-EEG would be 23 hour observation. However, the event being monitored may not occur in this time frame. Admission may be necessary for further monitoring or for preoperative localization of seizure foci. The length of stay is assigned per day, based on clinical review, up to four days. Inpatient stay beyond four days requires medical review. A-EEG is done on an outpatient basis.

Clinical Evidence: Ambulatory EEG

International League Against Epilepsy (ILAE) guidelines recommend the use of prolonged EEG where the diagnosis of epilepsy or the classification of the seizure syndrome is proving difficult. In a retrospective study, 324 consecutive prolonged outpatient A-EEGs were analyzed, each lasting 72-96 hours (4-5 days), without medication withdrawal. EEG data and the clinical record were reviewed to investigate the utility of the investigation. Of 324 studies: 219 (68%) studies gave positive data, 116 (36%) showed interictal epileptiform discharges (IEDs), 167 (52%) had events. 105 (32%) studies were normal. Overall 51% of studies changed management of which 22% of studies changed the diagnosis and 29% of studies refined the diagnosis by classifying the epilepsy into focal or generalized. The study confirms the diagnostic utility of outpatient A-EEG in the diagnosis of paroxysmal events.3

A prospective cohort study was performed in a Canadian academic center in order to assess the yield and tolerability of A-EEG in the adult population. Over a period of three years, 101 patients were included. The yield of A-EEG was assessed by taking into account the questions asked by the clinician before and after the investigation. One hundred
and one patients undergoing A-EEG were prospectively recruited during a three-year-period. Our population consisted of 45 males (44.6%) and 56 females (55.4%). The mean age of the group was 36.6 ± 16.1 years. Most of the patients had at least one previous routine EEG (93%). The primary reasons for the A-EEGs were subdivided into four categories: a) to differentiate between seizures and non-epileptic events; b) to determine the frequency of seizures and epileptiform discharges; c) to characterize seizure type or localization; and d) to potentially diagnose epilepsy. The mean duration of A-EEG recording was 32 ± 17 hours (15-96 hours). For 73 (72%) patients, the A-EEG provided information that was useful for the management. For 28 (28%) patients, the A-EEG did not provide information on diagnosis because no events or epileptiform activity occurred. In only 1 patient was the A-EEG inconclusive due to non-physiological artefacts. Three patients were referred for epilepsy surgery without the necessity of V-EEG telemetry. In this study, it was found that A-EEG has a high diagnostic yield (72%); careful selection of patients is the most important factor for a high diagnostic yield. The main use of A-EEG is the characterization of patients with non-epileptic events, in patients with a diagnosis of epilepsy that is not clear, and quantification of spikes and seizures to improve the medical management. A-EEG is a cost-effective solution for increasing demands for in-hospital V-EEG monitoring of adult patients.4

Clinical Evidence: Video EEG

For patients with recurrent clinical events, V-EEG recording in an epilepsy monitoring unit is the best, and sometimes the only, way to make a definitive diagnosis. Approximately 20 percent of patients referred for V-EEG monitoring for medically refractory seizures do not have epilepsy. In a retrospective review of 213 admissions (from 196 patients) to an inpatient epilepsy monitoring unit, a definitive diagnosis was reached in 88 percent of patients after a median stay of five day. Epilepsy was diagnosed in 71 percent and excluded in 22 percent of admissions. In patients diagnosed with epilepsy, the median time since the onset of symptoms was 18 years. Perhaps more worrisome was that patients determined not to have epilepsy had been treated with antiepileptic drugs (often multiple medications) for an average of nine years. The National Association of Epilepsy Centers guidelines recommend referral for V-EEG monitoring if spells are uncontrolled after one year, or if the patient has failed treatment with two to three antiepileptic medications. The majority of patients misdiagnosed with epilepsy are eventually found to have either psychogenic non-epileptic seizures (PNES) or (much less frequently) syncope. It is also well known that some patients with presumed PNES are found to have epileptic seizures on V-EEG. V-EEG monitoring can also help with seizure classification, which in turn impacts the most appropriate selection of an antiepileptic drug (AED). The clinical history can be misleading in this regard. As examples, a patient with staring spells may have absence seizures or focal seizures with impairment of consciousness, and a patient with generalized convulsions may have focal or generalized epilepsy. Although the presence of an aura strongly suggests partial-onset seizures, one study reported that symptoms interpreted by the patient as a seizure aura (often brief, nonspecific dizziness) occurred in up to 70 percent of those with primary generalized epilepsy [53].5

**POSITION STATEMENT**

**Applicable To:**
- Medicaid
- Medicare

**Ambulatory Electroencephalography (A-EEG)**

**Exclusions**

A-EEG **is not considered medically necessary** in the following circumstances:

- Study of neonates, or unattended, non-cooperative members; **OR,**
- Localization of seizure focus/foci when the seizure symptomatology and/or other EEG recordings indicate the presence of bilateral foci or rapid generalization; **OR,**
- Final evaluation of members being considered as candidates for resective surgery
Coverage

Ambulatory Electroencephalography (A-EEG) is considered medically necessary in the following circumstances:

- To differentiate between seizures and paroxysmal non-epileptic seizures; OR,
- For members with a clinical history suggestive of seizures and standard EEG testing is non-diagnostic; OR,
- For evaluation of seizures or syncope suspected to be cardiogenic in nature when cardiac evaluation has not been diagnostic; OR,
- When used for quantification of seizures in members who experience frequent seizures, such as petit mal or myoclonic seizures, among others; OR,
- When used in documenting seizures precipitated by naturally occurring, cyclic events or extraneous stimuli which are not reproducible in the hospital or laboratory setting i.e., loud sounds, flashing lights, sudden movements).

The following represent the number of 24-hour segments of recordings for testing:

- For diagnostic testing a maximum of two (2) to three (3) days is authorized.
- For pre-surgical evaluation a maximum of seven (7) to ten (10) days is authorized in order to capture at least three or four seizures in order to be sure of seizure onset location reliability. Members shall have a follow up appointment two / three days following monitoring.

Video Electroencephalography (V-EEG)

Exclusions

V-EEG is not medically necessary as an inpatient procedure when circumstances below are not present.

Coverage

Video Electroencephalography (V-EEG) is considered medically necessary for inpatient setting in the following circumstances:

1. Member presents with a suspected seizure as evidenced by all of the following:
   - Recurrent symptoms not classic for seizures; AND,
   - History and lab results are non-diagnostic for etiology of seizure; AND,
   - Routine EEG findings are non-specific; AND,
   - MRI results are normal or non-diagnostic for etiology of seizure; AND,
   - No sudden cessation of heavy alcohol use within 48 hours of seizure; AND,
   - No intoxication due to drugs of abuse within 48 hours of seizure.

OR,

2. Authorization for inpatient admission may be issued for inpatient setting when the member has a known seizure as evidenced by all of the following:
   - Refractory to Rx as evidenced by:
     - Rx with > 2 anticonvulsant medications; AND,
     - Anticonvulsant levels are therapeutic; AND,
     - No concurrent seizure-provoking medications; AND,

AND,
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- Routine EEG findings are non-specific; **AND**, 
- MRI results are normal or non-diagnostic for etiology of seizure.

In addition, authorization for inpatient admission should have accompanying documentation specifying why observation is not appropriate OR if the member has failed a 24 hour video EEG under observation.

Requests will be authorized for POS 11 (in office) if the criteria for items no. 1 and 2 are met.

Additional Information

Members may be authorized for inpatient admission to localize the seizure focus in members with documented medically refractory seizures prior to possible resective epilepsy surgery or intracranial electrode implantation and surgery. In addition, the following criteria must be met to authorize an initial 23 - 48 hour observation:

- For members with a diagnosis of known seizure history with increasing symptoms; **OR,**
- For members who are admitted to see if they are seizure-free prior to withdrawal from anti-epileptic medication; **OR,**
- For members with undiagnosed spell; **OR,**
- For members with a clinical history of seizures in whom standard EEG testing, MRI, and neurological examination have been non-diagnostic; **OR,**
- For members with an epilepsy diagnosis, to evaluate additional events that are different from their typical seizures to determine the nature of the event and what changes are needed to the treatment plan; **OR,**
- To establish specific type of epilepsy and localization of seizures in poorly characterized seizure types where such characterization is needed to determine the most appropriate therapeutic regimen; **OR,**
- To distinguish between epileptic seizures and non-epileptic episodes (psychogenic seizures, syncope, hyperventilation episodes)

CODING

Covered CPT® Codes

95950 Monitoring for identification and lateralization of cerebral seizure focus, electroencephalographic (e.g., 8 channel EEG) recording and interpretation, each 24 hours**

95951 Monitoring for localization of cerebral seizure focus by cable or radio, 16 or more channel telemetry, combined electroencephalographic (EEG) and video recording and interpretation (e.g., for pre-surgical localization), each 24 hours**

95953 Monitoring for localization of cerebral seizure focus by computerized portable 16 or more channel EEG, electroencephalographic (EEG) recording and interpretation, each 24 hours**

95956 Monitoring for localization of cerebral seizure focus by cable or radio, 16 or more channel telemetry, electroencephalographic (EEG) recording and interpretation, each 24 hours**

** Modifier Code 52 must be used when recording is less than 12 hours. This should not be reported more than one time per 24 hour period.

Covered ICD-9-CM Procedure Code

89.19 Video and Radio-telemetered electroencephalographic monitoring; EEG Monitoring

Covered DRAFT ICD-10-PCS Codes

4A1034Z Monitoring of Central Nervous Electrical Activity, Percutaneous Approach

4A10X4Z Monitoring of Central Nervous Electrical Activity, External Approach

4A1134Z Monitoring of Peripheral Nervous Electrical Activity, Percutaneous Approach

4A11X4Z Monitoring of Peripheral Nervous Electrical Activity, External Approach

HCPCS Codes - No applicable codes.
Covered ICD-9-CM Diagnosis Codes
345.00 Generalized Nonconvulsive Epilepsy without Intractable Epilepsy
345.01 Generalized Nonconvulsive Epilepsy with Intractable Epilepsy
345.10 Generalized Convulsive Epilepsy without Intractable Epilepsy
345.11 Generalized Convulsive Epilepsy with Intractable Epilepsy
345.2 Petit Mal Status Epileptic
345.3 Grand Mal Status Epileptic
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 Infantile Spasms without Intractable Epilepsy
345.61 Infantile Spasms with Intractable Epilepsy
345.70 Epilepsia Partialis Continua without 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 Epilepsy Unspecified without Intractable Epilepsy
345.91 Epilepsy Unspecified with Intractable Epilepsy
780.39 Other Convulsions

Covered ICD-10-CM Diagnosis Codes
G40.001 - G40.919 Epilepsy and recurrent seizures
R56.9 Unspecified convulsions

REFERENCES

MEDICAL POLICY COMMITTEE HISTORY AND REVISIONS

Date       Action
8/6/2015    Approved by MPC. Included criteria for POS11.
2/5/2015    Approved by MPC. Included information on time limits with respect to monitoring.
12/4/2014   Approved by MPC. No changes.
12/5/2013   Approved by MPC. Expanded criteria.
5/3/2012    Approved by MPC. No changes.
12/1/2011   New template design approved by MPC.
7/18/2011   Approved by MPC.