Video Electroencephalographic (vEEG) Monitoring and Recording

Policy Number: CS158.O
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Instructions for Use

Table of Contents **Page**

Commercial Policy

- Video Electroencephalographic (vEEG) Monitoring and Recording

Application

This Medical Policy does not apply to the states listed below; refer to the state-specific policy/guideline, if noted:

State	Policy/Guideline
Idaho	Video Electroencephalographic (vEEG) Monitoring and Recording (for Idaho Only)
Indiana	None
Kansas	Video Electroencephalographic (vEEG) Monitoring and Recording (for Kansas Only)
Kentucky	Video Electroencephalographic (vEEG) Monitoring and Recording (for Kentucky Only)
Louisiana	None
New Jersey	Video Electroencephalographic (vEEG) Monitoring and Recording (for New Jersey Only)
New Mexico	Video Electroencephalographic (vEEG) Monitoring and Recording (for New Mexico Only)
Ohio	Video Electroencephalographic (vEEG) Monitoring and Recording (for Ohio Only)
Pennsylvania	Video Electroencephalographic (vEEG) Monitoring and Recording (for Pennsylvania Only)
Tennessee	Video Electroencephalographic (vEEG) Monitoring and Recording (for Tennessee Only)

Coverage Rationale

Video electroencephalographic (vEEG) monitoring and recording is proven and medically necessary in certain circumstances. For medical necessity clinical coverage criteria, refer to the InterQual® CP: Procedures:

- Video Electroencephalographic (EEG) Monitoring
- Video Electroencephalographic (EEG) Monitoring (Pediatric)

Click here to view the InterQual® criteria.

If the InterQual® criteria for video EEG monitoring referred to above are met, then inpatient admission is proven and medically necessary for any of the following circumstances:

- Individual is not expected to have a seizure or seizure-like diagnostic event within a timeframe that is reasonable for an ambulatory vEEG recording; or
- Individual is undergoing preoperative evaluation for epilepsy surgery; or

- Seizure provocation maneuvers are required that warrant direct observation in an inpatient setting; or
- Seizure medication is being adjusted in such a way as to risk provoking an event that would require inpatient management; or
- Seizure medication discontinuation is required to provoke seizure for diagnostic purposes

Medical Records Documentation Used for Reviews

Benefit coverage for health services is determined by the federal, state, or contractual requirements, and applicable laws that may require coverage for a specific service. Medical records documentation may be required to assess whether the member meets the clinical criteria for coverage but does not guarantee coverage of the service requested; refer to the protocol titled Medical Records Documentation Used for Reviews.

Applicable Codes

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by federal, state, or contractual requirements and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Policies and Guidelines may apply.

CPT Code	Description
95700	Electroencephalogram (EEG) continuous recording, with video when performed, setup, patient education, and takedown when performed, administered in person by EEG technologist, minimum of 8 channels
95711	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; unmonitored
95712	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; with intermittent monitoring and maintenance
95713	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, 2-12 hours; with continuous, real-time monitoring and maintenance
95714	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, each increment of 12-26 hours; unmonitored
95715	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, each increment of 12-26 hours; with intermittent monitoring and maintenance
95716	Electroencephalogram with video (VEEG), review of data, technical description by EEG technologist, each increment of 12-26 hours; with continuous, real-time monitoring and maintenance
95718	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation and report, 2-12 hours of EEG recording; with video (VEEG)
95720	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, each increment of greater than 12 hours, up to 26 hours of EEG recording, interpretation and report after each 24-hour period; with video (VEEG)
95722	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation, and summary report, complete study; greater than 36 hours, up to 60 hours of EEG recording, with video (VEEG)
95724	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation, and summary report, complete study; greater than 60 hours, up to 84 hours of EEG recording, with video (VEEG)
95726	Electroencephalogram (EEG), continuous recording, physician or other qualified health care professional review of recorded events, analysis of spike and seizure detection, interpretation, and summary report, complete study; greater than 84 hours of EEG recording, with video (VEEG)

Description of Services

Video electroencephalographic (vEEG) monitoring is electroencephalographic (EEG) monitoring that is enhanced by the addition of video recording. Video EEG monitoring may be used to distinguish between epileptic and non-epileptic seizures, to differentiate epileptic events from psychogenic seizures, to classify seizure type, and to assist in surgical planning. Video EEG first became available in specialized centers, but improvements in digital technology have made equipment far more accessible, and vEEG units are now available in a variety of clinical settings, including tertiary hospitals, general hospitals, outpatient centers, and doctor's offices.

Antiepileptic drugs (AEDs) may be reduced during the inpatient stay to prompt a seizure. In addition, other provocation maneuvers such as sleep deprivation, fatigue, hyperventilation, photic stimulation, or exercise may be used to elicit a seizure.

Clinical Evidence

Timpte et al. (2023) performed a retrospective, monocentric observational study of inpatient video-electro-encephalography (VEM) to assess whether 48 hour or 72-hour VEM is more effective than 24-hour VEM. The study included 111 participants, and the authors indicated that 69.4% (77/111) of patients displayed epileptic abnormalities (EAs) during VEM. In this group, the first occurrence of EAs was observed within 24 h in 92.2% (71/77) of patients and within 24-72 h in 7.8% (6/77). They observed that extended VEM could be beneficial in cases with a high likelihood of epilepsy or where other methods like sleep-EEG or ambulatory EGG yield inconclusive results. Additionally, they reported that VEM monitoring for up to 72 hours enhances the likelihood of detecting EA in individuals with focal epilepsy and undetermined epilepsy types, as well as increases the chance of capturing spontaneous seizures.

Cho et al. (2019) evaluated the diagnostic yield and clinical utility of video electroencephalographic (vEEG) performed in a comprehensive epilepsy center. The authors retrospectively reviewed all cases of vEEG performed from May 2003 to April 2018, and analyzed the data to determine its clinical utility and diagnostic yield. A total of 1,025 cases of vEEG were included. The mean duration of vEEG was 2.3 ±1.6 days. A total of 763 vEEGs documented epileptic seizures or interictal epileptiform discharges (IEDs) to confirm the diagnosis of epilepsy. There were 99 psychogenic non-epileptic seizure, 36 status epilepticus, and 34 vEEGs which revealed generalized or focal slow activities without any clinical seizures or IEDs. Video EEG was normal in 170 cases. The diagnostic yield of vEEG varied from 83.4 to 88.4% depending on its definition. The proportion of epilepsy in total cases of vEEG continued to decrease from 77.2 to 61.4%. In contrast, the proportion of normal vEEG steadily increased from 4.1 to 24.1% during the same time period. According to the authors, this study shows the utility of vEEG in clinical circumstances beyond epilepsy. Video EEG can play a pivotal role in the diagnostic approach to epilepsy and its differential diagnoses.

Friedman and Hirsch (2009) reported on patients requiring prolonged monitoring with video-electroencephalography to make an accurate diagnosis and quantified how often this occurs. The authors performed a retrospective review of 248 consecutive adult patients admitted to the epilepsy monitoring unit during 12 months for event characterization or presurgical evaluation. For the diagnosis of definite epilepsy, at least one epileptic seizure must have been recorded with video-electroencephalography. The median time to first diagnostic event, whether epileptic seizure or nonepileptic event, was 2 days; 35% required three or more days and 7% > 1 week. Twelve percent of those with definite epilepsy never had interictal epileptiform discharges and 17% of those with nonepileptic events had interictal epileptiform discharges. Six percent of patients with definite epilepsy had neither epileptic seizures nor interictal epileptiform discharges until day three or after. Based on these results, the authors indicated that it is common to require three or more days in an epilepsy monitoring unit to record and diagnose the nature of paroxysmal episodes and not rare to require more than a week.

Noe and Drazkowski (2009) determined the rate of medical complications from long-term video-electroencephalographic (EEG) monitoring for epilepsy. The authors reviewed the medical records of 428 consecutive adult patients with epilepsy who were admitted for diagnostic scalp video-EEG monitoring; 149 met inclusion criteria for the study. Seizure number and type as well as timing and presence of seizure-related adverse outcomes were noted. Of the 149 adult patients included in the study, seizure clusters occurred in 35 (23%); 752 seizures were recorded. The mean time to first seizure was 2 days, with a mean length of stay of 5 days. Among these patients, there was one episode of status epilepticus, three potentially serious electrocardiographic abnormalities, two cases of postictal psychosis, and four vertebral compression fractures during a generalized convulsion, representing 11% of patients with a recorded generalized tonic-clonic seizure. No deaths, transfers to the intensive care unit, falls, dental injuries, or pulmonary complications were recorded. An adverse event requiring intervention or interfering with normal activity occurred in 21% of these patients. Length of stay was not affected by occurrence of adverse events. The authors concluded that prolonged video-EEG monitoring is an acceptably safe procedure. According to the authors, procedures that increase the likelihood of recording

seizures include sleep deprivation and medication withdrawal. Although good outcomes were observed in this series, the frequency of noted adverse events underscores the importance of appropriate close monitoring for seizures and potential injury.

Alving and Beniczky (2009) assessed the diagnostic usefulness and the necessary duration of inpatient long-term video-EEG monitoring (LTM) for the referral groups, in patients extensively investigated before the monitoring. The main referral categories are diagnosis (epileptic versus non-epileptic disorder), seizure classification and presurgical evaluation. An LTM was considered diagnostically useful when it provided previously not reported, clinically relevant information on the paroxysmal event. For the presurgical group, reaching a decision concerning surgery was an additional requirement. The authors reviewed data from 234 consecutive LTM-sessions (221 patients) over a 2-year period. In 44% of the cases the LTM was diagnostically useful. There were no significant differences concerning diagnostic usefulness among the main referral groups: diagnostic (41%), classification (41%) and presurgical (55%). Diagnostic usefulness did not differ among the age groups. The duration of the successful LTM-sessions was significantly longer in the presurgical group (mean: 3.5 days) than in the diagnostic and classification groups (2.4 and 2.3 days, respectively). The authors concluded that LTM is a valuable diagnostic tool even in patients extensively investigated before the monitoring and is equally effective in the referral and age groups.

Yogarajah et al. (2009) evaluated guideline recommendations that long term EEG monitoring (LTM) be done in patients for whom seizure or syndrome type is unclear, and in patients for whom it is proving difficult to differentiate between epilepsy and non-epileptic attack disorder (NEAD). The study reviewed the case notes of all admissions to the Sir William Gowers Unit at the National Society for Epilepsy in the years 2004 and 2005. A record was made of the type, duration, and result of all LTM performed both prior to and during the admission. Pre- and post-admission diagnoses were compared, and patients were divided according to whether LTM had resulted in a change in diagnosis, refinement in diagnosis or no change in diagnosis. The distinction between change and a refinement in the diagnosis was made on the basis of whether or not this alteration resulted in a change in management. A total of 612 patients were admitted during 2004 and 2005, 230 of whom were referred for diagnostic clarification. Of these, LTM was primarily responsible for a change in diagnosis in 133 (58%) and a refinement of diagnosis in 29 (13%). In 65 (29%) patients the diagnosis remained the same after LTM. In those patients in whom there was a change in diagnosis, the most common change was in distinguishing epilepsy from NEAD in 73 (55%) and in distinguishing between focal and generalized epilepsy in 47 (35%). LTM was particularly helpful in differentiating frontal lobe seizures from generalized seizures and non-epileptic attacks. Inpatient ambulatory EEG proved as effective as video telemetry in helping to distinguish between NEAD, focal and generalized epilepsy. According to the authors, this study showed that LTM led to an alteration in the diagnosis of 71% of patients referred to a tertiary center for diagnostic clarification of possible epilepsy. The authors concluded that this service evaluation supports the use of performing LTM (either video or ambulatory) in a specialist setting in patients who present diagnostic difficulty.

Clinical Practice Guidelines

American Clinical Neurophysiology Society (ACNS)

The ACNS released “Guidelines for Long-Term Monitoring for Epilepsy” in 2008. In the guidelines, long-term monitoring was defined as the simultaneous recording of EEG and clinical behavior over extended periods of time to evaluate patients with paroxysmal disturbances of cerebral function. Long-term monitoring may or may not include video recordings for the documentation of clinical behavior (observational techniques could also be used). The guidelines noted that vEEG was the most effective means of behavior monitoring in an inpatient setting. Advantages for vEEG were noted to include: (1) an objective record of behavior, available for replay and associated direct EEG correlation; (2) temporal correlations accurate when synchronization is achieved with time code generators or same tape recording; (3) usefulness in seizures of all types, even if minimal behavioral manifestations are initially unrecognized since the permanent record allows subsequent review of behavior associated with EEG changes. The interaction between monitoring personnel and the patient, when properly structured, defines the events more explicitly than other mechanisms. Disadvantages included the need for specialized equipment, the time commitment, and the limitation of movement due to the requirement for the patient to stay in view of the camera (ACNS, 2008).

International Federation of Clinical Neurophysiology (IFCN)

The International Federation of Clinical Neurophysiology (Tatum et al. 2018) summarized the scientific evidence for the utility of EEG when diagnosing and monitoring individuals with epilepsy. The IFCN summary statements/recommendations includes the following:

- Video-EEG monitoring can provide a definitive diagnosis in most individuals with epilepsy when seizures are recorded.
- Video-EEG monitoring is useful in an epilepsy surgery evaluation.

International League Against Epilepsy (ILAE)

A 2007 position paper from the ILAE (Velis et al., 2007) contains recommendations regarding the requirements and applications for long-term recordings in epilepsy. Specifically, the paper's purpose was to update the state of knowledge based on existing national and international guidelines on the application of long-term monitoring (LTM) (approximately 5.5 to 7.6 days) and to provide a selective review of the literature on controversies and issues such as techniques to increase the yield of clinically relevant seizures such as vEEG. The ILAE recommends the use of LTM in epilepsy for the following indications:

- Detection, characterization, and quantification on video/EEG of ictal events, including the appropriate activation procedures to elicit them in individual patients in whom the diagnosis of an underlying epilepsy has already been made, and when the type of seizure or syndrome is not clear.
- Documentation of the electroclinical manifestations of habitual seizures including noninvasive and invasive video/EEG LTM during presurgical evaluations.
- Differential diagnosis between epileptic and non-epileptic conditions, characterized by frequently and intermittently occurring behavioral changes including psychogenic nonepileptic events and sleep disorders, particularly those involving paroxysmal movement disorders.
- Documentation of diurnal or circadian variation in occurrence of epileptiform paroxysms, in conjunction with pharmacological interventions and/or of the effect of these interventions on diurnal or circadian behavioral changes.
- Documentation of specific patterns in the occurrence of epileptiform paroxysms during sleep and/or of disruption of sleep architecture in so-called "cognitive epilepsy" cases in the pediatric population.
- Monitoring in the intensive care unit (ICU) for the effectiveness of treatment of status epilepticus and for the identification of subclinical seizures and subclinical status epilepticus, conditions that have been shown to be more frequent than usually thought in the ICU.

In 2022, The Working Group of the International Federation of Clinical Neurophysiology (IFCN) and ILAE (Tatum et al. 2022) reviewed the published evidence to develop indications (and minimum standards) for conducting inpatient long-term video-electroencephalographic monitoring (LTVEM). The following were recommended:

- To differentiate between epileptic and non-epileptic events, in patients where the diagnosis is in question (strong recommendation).
- To classify patients with epilepsy in whom the seizure type or epilepsy syndrome is undetermined (strong recommendation).
- For the presurgical evaluation of patients with drug resistant epilepsies (strong recommendation).

U.S. Food and Drug Administration (FDA)

This section is to be used for informational purposes only. FDA approval alone is not a basis for coverage.

Electroencephalographic (EEG) monitoring and video recording is a procedure and therefore is not regulated by the FDA.

There are many EEG devices used for monitoring and video recording. For information on classification of EEG devices, refer to the following website: https://www.fda.gov/medical-devices/resources-you-medical-devices.
(Accessed August 19, 2024)

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Policy History/Revision Information

Date	Summary of Changes
07/01/2025	**Template Update** • Removed content/language pertaining to the state of Mississippi
06/01/2025	**Application** ***Idaho*** and ***Kansas*** • Added language to indicate this Medical Policy does not apply to the states of Idaho and Kansas; refer to the state-specific policy versions **Medical Records Documentation Used for Reviews** • Updated reference link to the guidelines titled *Medical Records Documentation Used for Reviews*

12/01/2024	**Medical Records Documentation Used for Reviews**
	• Added language to indicate:
	  ○ Benefit coverage for health services is determined by federal, state, or contractual requirements, and applicable laws that may require coverage for a specific service
	  ○ Medical records documentation may be required to assess whether the member meets the clinical criteria for coverage but does not guarantee coverage of the service requested; refer to the protocol titled Medical Records Documentation Used for Reviews
	Supporting Information
	• Updated *Clinical Evidence* and *References* sections to reflect the most current information
	• Archived previous policy version CS158.N

Instructions for Use

This Medical Policy provides assistance in interpreting UnitedHealthcare standard benefit plans. When deciding coverage, the federal, state, or contractual requirements for benefit plan coverage must be referenced as the terms of the federal, state, or contractual requirements for benefit plan coverage may differ from the standard benefit plan. In the event of a conflict, the federal, state, or contractual requirements for benefit plan coverage govern. Before using this policy, please check the federal, state, or contractual requirements for benefit plan coverage. UnitedHealthcare reserves the right to modify its Policies and Guidelines as necessary. This Medical Policy is provided for informational purposes. It does not constitute medical advice.

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