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Polysomnography for Non-Respiratory Sleep Disorders

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Related Policies (if applicable)
MED204.005: Diagnosis and Medical Management of Sleep Related Breathing Disorders

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Coverage

Polysomnography (PSG) and a multiple sleep latency test (MSLT) performed on the day after the PSG **may be considered medically necessary** in the evaluation of suspected narcolepsy or idiopathic hypersomnia.

PSG **may be considered medically necessary** when evaluating individuals with parasomnias when there is a history of sleep-related injurious or potentially injurious disruptive behaviors.

PSG **may be considered medically necessary** when a diagnosis of periodic limb movement disorder is considered when there is:

- A complaint of repetitive limb movement during sleep by the individual or an observer; and
- Obstructive sleep apnea (OSA) has been excluded, or OSA has been adequately treated; and
- At least **one** of the following is present:
  1. Frequent awakenings; or
  2. Fragmented sleep; or
  3. Difficulty maintaining sleep; or
  4. Excessive daytime sleepiness.

PSG for the diagnosis of periodic limb movement disorder **is considered not medically necessary** when there is concurrent untreated obstructive sleep apnea, restless legs syndrome, narcolepsy, or rapid eye movement sleep behavior disorder.

PSG **is considered experimental, investigational and/or unproven** for the diagnosis of non-respiratory sleep disorders not meeting the criteria above, including but not limited to nightmare disorder, depression, sleep-related bruxism, or noninjurious disorders of arousal.

NOTE 1: For information on PSG for obstructive sleep apnea, see Medical Policy MED204.005.

Policy Guidelines

None

Description

Polysomnography (PSG) records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as rapid eye movement (REM) sleep behavior disorder.

Hypersomnias
The hypersomnias include such disorders as narcolepsy, Klein-Levine syndrome, and idiopathic hypersomnolence. Narcolepsy is a neurologic disorder characterized predominantly by abnormalities of REM sleep, some abnormalities of non-REM (NREM) sleep, and the presence of excessive daytime sleepiness that cannot be fully relieved by any amount of sleep. The classic symptoms include hypersomnolence, cataplexy, sleep paralysis, and hypnagogic (onset of sleep) hallucinations. Cataplexy refers to the total or partial loss of muscle tone in response to sudden emotion. Most patients with cataplexy have abnormally low levels of hypocretin-1 (orexin-A) in the cerebrospinal fluid. (1) Narcolepsy type 1 (narcolepsy with cataplexy) is defined as excessive daytime sleepiness and at least one of the following criteria: a) hypocretin deficiency or b) cataplexy and a positive multiple sleep latency test (MSLT). During the MSLT, the patient lies down in a dark, quiet room to assess the time to enter the different stages of sleep. The test is repeated every 2 hours throughout the day, and the maximum time allowed to fall sleep is typically set at 20 minutes. Patients with narcolepsy often have a mean sleep latency of fewer than 5 minutes and 2 or more early-onset REM periods during the MSLT naps. People with idiopathic hypersomnia fall asleep easily but typically do not reach REM sleep during the MSLT. Narcolepsy type 2 (narcolepsy without cataplexy) is defined by chronic sleepiness plus a positive MSLT; hypocretin-1 levels are in the normal range in most patients.

Parasomnias
Parasomnias are abnormal behavioral, experiential, or physiologic events that occur during entry into sleep, within sleep, or during arousals from sleep. Parasomnias can result in a serious

disruption of sleep-wake schedules. Some, particularly sleepwalking, sleep terrors, and REM sleep behavior disorder (RBD), can cause injury to the patient and others. Parasomnias are classified into parasomnias associated with REM sleep, parasomnias associated with NREM sleep, and other parasomnias.

Parasomnias Associated with REM Sleep

Normally, REM sleep is accompanied by muscle atonia, in which there is an almost complete paralysis of the body through inhibition of motor neurons. In patients with RBD, muscle tone is maintained during REM sleep. This can lead to abnormal or disruptive behaviors associated with vivid dreams such as talking, laughing, shouting, gesturing, grabbing, flailing arms, punching, kicking, sitting up or leaping from bed, and running. (2) Violent episodes that carry a risk of harm to the patient or bed partner may occur up to several times nightly. Idiopathic RBD is associated with the development of degenerative synucleinopathies (Parkinson disease, dementia with Lewy bodies, multiple systems atrophy) in about half of patients. Guidelines recommend maintaining a safe sleeping environment for both the patient and bed partner along with medical therapy. Other parasomnias associated with REM sleep are recurrent isolated sleep paralysis and nightmare disorder.

Parasomnias Associated with NREM Sleep

Disorders of arousal from NREM sleep result from the intrusion of wake into NREM sleep. These include confusional arousals, sleepwalking, and sleep terrors. In these parasomnias, the patient has an incomplete awakening from NREM sleep, usually appears awake with eyes open, is unresponsive to external stimuli, and is amnestic to the event. Sleepwalking can range from calm behaviors such as walking through a house to violent and/or injurious behaviors such as jumping out of a second story window. Patients with sleep terrors (also called night terrors) typically awaken with a loud scream and feeling of intense fear, jump out of bed, and occasionally may commit a violent act.

Other Parasomnias

The category of “other parasomnias” has no specific relation to sleep stage and includes sleep-related dissociative disorders, sleep-related enuresis, sleep-related groaning, exploding head syndrome, sleep-related hallucinations, and a sleep-related eating disorder. Diagnosis of these disorders is primarily clinical, although PSG may be used for differential diagnosis.

- In sleep-related dissociative disorders, behaviors occur during an awakening, but the patient is amnestic to them.
- Sleep-related enuresis (bedwetting) is characterized by recurrent involuntary voiding in patients greater than 5 years of age.
- Sleep-related groaning is a prolonged vocalization that can occur during either NREM or REM sleep.
- Exploding head syndrome is a sensation of a sudden loud noise or explosive feeling within the head on falling asleep or during an awakening from sleep.
- Sleep-related hallucinations are hallucinations that occur on falling asleep or on awakening.

- Sleep-related eating disorder is characterized by recurrent episodes of arousals from sleep with involuntary eating or drinking. Patients may have several episodes during the night, typically eat foods that they would not eat during the day and may injure themselves by cooking during sleep.

Sleep-Related Movement Disorders
Sleep-related movement disorders include restless legs syndrome (RLS) and periodic limb movement disorder (PLMD).

Restless Legs Syndrome
RLS is a neurologic disorder characterized by uncomfortable or odd sensations in the leg that usually occur during periods of relaxation, such as while watching television, reading, or attempting to fall asleep. Symptoms occur primarily in the evening. The sensations are typically described as creeping, crawling, itchy, burning, or tingling. There is an urge to move in an effort to relieve these feelings, which may be partially relieved by activities such as rubbing or slapping the leg, bouncing the feet, or walking around the room.

Periodic Limb Movement Disorder
Periodic limb movements are involuntary, stereotypic, repetitive limb movements during sleep, which most often occur in the lower extremities, including the toes, ankles, knees, and hips, and occasionally in the upper extremities. The repetitive movements can cause fragmented sleep architecture, with frequent awakenings, a reduction in slow-wave sleep and decreased sleep efficiency, leading to excessive daytime sleepiness. PLMD alone is thought to be rare because periodic limb movements are typically associated with RLS, RBD, or narcolepsy and represent a distinct diagnosis from PLMD. (3)

Diagnosis
PSG is a recording of multiple physiologic parameters relevant to sleep. The standard full polysomnogram includes:
- Electroencephalography to differentiate the various stages of sleep and wake.
- Chin electromyography and electrooculography to assess muscle tone and detect REM sleep.
- Respiratory effort, airflow, blood oxygen saturation (oximetry), and electrocardiography to assess apneic events.
- Anterior tibialis electromyogram to assess periodic limb movements during sleep, and
- Video recording to detect any unusual behavior.

This policy addresses PSG for non-respiratory sleep disorders, which include the hypersomnias (e.g., narcolepsy), parasomnias, and movement disorders (e.g., RLS, PLMD).

Regulatory Status
A large number of PSG devices have been approved since 1986. U.S. Food and Drug Administration product code: OLV.

Rationale

Medical policies assess whether a medical test is clinically useful. A useful test provides information to make a clinical management decision that improves the net health outcome. That is, the balance of benefits and harms is better when the test is used to manage the condition than when another test or no test is used to manage the condition.

The first step in assessing a medical test is to formulate the clinical context and purpose of the test. The test must be technically reliable, clinically valid, and clinically useful for that purpose. Medical policies assess the evidence on whether a test is clinically valid and clinically useful. Technical reliability is outside the scope of these reviews, and credible information on technical reliability is available from other sources.

Hypersomnia

Clinical Context and Therapy Purpose

The purpose of polysomnography (PSG) is to provide a diagnostic option that is an alternative to or an improvement on existing tests in individuals with suspected hypersomnia.

The following PICO was used to select literature to inform this policy.

Populations

The relevant population of interest is individuals with suspected hypersomnia.

Interventions

The test being considered is PSG. PSG records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as rapid eye movement (REM) sleep behavior disorder (RBD).

Comparators

Comparators of interest include clinical diagnosis alone.

Outcomes

The general outcomes of interest are test accuracy, symptoms, functional outcomes, and quality of life (QOL). The classic symptoms include hypersomnolence, cataplexy, sleep paralysis, and hypnagogic (onset of sleep) hallucinations as well as related findings on PSG.

Study Selection Criteria

Below are selection criteria for studies to assess whether a test is clinically valid.

- The study population represents the population of interest. Eligibility and selection are described.
- The test is compared with a credible reference standard.

- If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (e.g., receiver operating characteristic, area under receiver operating characteristic, c-statistic, likelihood ratios) may be included but are less informative.
- Studies should also report reclassification of diagnostic or risk category.

Clinically Valid

A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Systematic Reviews

Evidence reviewed by Chesson et al. (1997) for the American Academy of Sleep Medicine (AASM) included data on 1602 patients, of whom 176 patients had narcolepsy, and 1426 had other sleep disorders. (4) However, 7% of obstructive sleep apnea patients and 5% of other sleep disorders patients had 2 sleep-onset REMs on a multiple sleep latency test (MSLT), leading to a low predictive value for narcolepsy. No data were found that validated the maintenance of wakefulness test (which measures a patient's ability to stay awake in a quiet sleep-inducing environment), limited or partial PSG, portable recording, isolated MSLT, or separately performed PSG and MSLT as an alternative to the criterion standard of nocturnal PSG with an on the day following the diagnosis of narcolepsy. An evidence review by Kushida et al. (2005), also for AASM, found that the presence of 2 or more early sleep-onset latency episodes was associated with a sensitivity of 78% and specificity of 93% for the diagnosis of narcolepsy. (1)

Clinically Useful

A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from randomized controlled trials (RCTs).

Chain of Evidence

Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

Based on the evidence reviewed, the updated AASM (2005) guidelines indicated that PSG should be used to rule out other potential causes of sleepiness followed by an MSLT to confirm the clinical impression of narcolepsy. These tests assume greater significance if cataplexy is

lacking. In the absence of cataplexy and when there are one or more of the other symptoms, the laboratory criteria are required to establish the diagnosis of narcolepsy.

Section Summary: Hypersomnia

Evidence from a systematic review has indicated that, in patients suspected of having hypersomnia, nocturnal PSG should be used to rule out other sleep disorders that may cause daytime sleepiness. After excluding other sleep disorders with nocturnal PSG or a portable sleep study, short sleep latency in an MSLT has high specificity for the diagnosis of hypersomnia.

Typical or Benign Parasomnia

Clinical Context and Test Purpose

The purpose of PSG is to provide a diagnostic option that is an alternative to or an improvement on existing tests in individuals with typical or benign parasomnia.

The following PICO was used to select literature to inform this policy.

Populations

The population of interest is individuals with typical or benign parasomnias.

Interventions

The test being considered is PSG. PSG records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as RBD.

Comparators

Comparators of interest include clinical diagnosis alone.

Outcomes

The general outcomes of interest are test accuracy, symptoms, functional outcomes, and QOL as well as related findings on PSG.

Study Selection Criteria

Below are selection criteria for studies to assess whether a test is clinically valid.

- The study population represents the population of interest. Eligibility and selection are described.
- The test is compared with a credible reference standard.
- If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (e.g., receiver operating characteristic, area under receiver operating characteristic, c-statistic, likelihood ratios) may be included but are less informative.
- Studies should also report reclassification of diagnostic or risk category.

Clinically Valid

A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Systematic Reviews

Evidence reviewed by Chesson et al. (1997) for AASM indicated that typical sleepwalking or sleep terrors, with onset in childhood, a positive family history, occurrence during the first third of the night, amnesia for the events, prompt return to sleep following the events, and relatively benign automatistic behaviors, may be diagnosed on the basis of their historical clinical features. (4) This conclusion was based on very consistent descriptive literature (case series and cohort studies).

Clinically Useful

A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from RCTs.

Chain of Evidence

Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

Section Summary: Typical or Benign Parasomnia

The evidence on the diagnosis of typical or benign parasomnias includes a systematic review of case series and cohort studies. This evidence has shown that PSG does not provide additional diagnostic information beyond what can be obtained from historical clinical features.

Violent or Potentially Injurious Parasomnia

Clinical Context and Test Purpose

The purpose of PSG is to provide a diagnostic option that is an alternative to or an improvement on existing tests in individuals with violent or potentially injurious parasomnia.

The following PICO was used to select literature to inform this policy.

Populations

The population of interest are individuals with violent or potentially injurious parasomnia.

Interventions

The test being considered is PSG. PSG records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as RBD.

Comparators
Comparators of interest include clinical diagnosis alone.

Outcomes
The general outcomes of interest are test accuracy, symptoms, functional outcomes, and QOL as well as related findings on PSG.

Study Selection Criteria
Below are selection criteria for studies to assess whether a test is clinically valid.

- The study population represents the population of interest. Eligibility and selection are described.
- The test is compared with a credible reference standard.
- If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (e.g., receiver operating characteristic, area under receiver operating characteristic, c-statistic, likelihood ratios) may be included but are less informative.
- Studies should also report reclassification of diagnostic or risk category.

Clinically Valid
A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Systematic Reviews
When events are not typical of benign partial arousals and where other diagnoses, prognoses, and interventions should be considered, PSG was recommended by Chesson et al. (1997) and supported by AASM. This review included only 3 articles on disorders of arousal and 2 articles for RBD that included comparison data for normal controls. (4) Most articles supporting the utility of PSG were limited by biases inherent in uncontrolled clinical reports. Evidence reviewed by Aurora et al. (2010) for an AASM best practice guideline indicated that sleep-related injuries are a significant portion of the morbidity in RBD, with a prevalence in diagnosed RBD patients ranging from 30% to 81%. (2) Types of injuries ranged from ecchymoses and lacerations to fractures and subdural hematomas, with ecchymoses and lacerations being significantly more common than fractures. In a series of 92 patients, 64% of the bed partners sustained punches, kicks, attempted strangulation, and assault with objects. Minimal diagnostic criteria for RBD requires the presence of REM sleep without atonia, defined as sustained or intermittent elevation of submental electromyogram tone or excessive phasic muscle activity in the limb electromyogram. (2) Two clinical series with over 100 patients each with various parasomnias found that PSG had an overall diagnostic yield in 65% and 91% of cases. Results from a more recent retrospective observational study of video PSG (vPSG) were similar, finding that among a

cohort of 516 patients with suspected non-REM parasomnias, 65% had vPSG findings consistent with a clinical diagnosis of parasomnia. (5) In a systematic review assessing the diagnosis of RBD, Neikrug and Ancoli-Israel (2012) reported that diagnostic accuracy increases when combining the use of clinical history and video PSG to document the intermittent or sustained loss of muscle tone or the actual observation of RBD occurrences. (6)

Clinically Useful

A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from RCTs.

Chain of Evidence

Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

The need for PSG was also indicated in a review of parasomnias by Goldstein (2011), who concluded that, although RBD is the only parasomnia requiring PSG for diagnosis, PSG may be needed to rule out another sleep pathology, such as sleep-disordered breathing or periodic limb movements of sleep, that might cause a parasomnia. (7)

Section Summary: Violent or Potentially Injurious Parasomnia

The evidence on the use of PSG for diagnosing violent or potentially injurious parasomnia includes many case series and a systematic review of nonrandomized comparative studies. The large series showed a high diagnostic yield for video PSG in cases with a violent or potentially injurious parasomnia based on clinical history. Clinical utility is based on the importance of excluding other sleep disorders and appropriate interventions in patients who exhibit REM sleep without atonia.

Restless Legs Syndrome

Clinical Context and Test Purpose

The purpose of PSG is to provide a diagnostic option that is an alternative to or an improvement on existing tests in individuals with restless legs syndrome (RLS).

The following PICO was used to select literature to inform this policy.

Populations

The population of interest is individuals with RLS.

Interventions
The test being considered is PSG. PSG records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as RBD.

Comparators
Comparators of interest include clinical diagnosis alone.

Outcomes
The general outcomes of interest are test accuracy, symptoms, functional outcomes, and QOL, as well as the results of the PSG.

Study Selection Criteria
Below are selection criteria for studies to assess whether a test is clinically valid.

- The study population represents the population of interest. Eligibility and selection are described.
- The test is compared with a credible reference standard.
- If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (e.g., receiver operating characteristic, area under receiver operating characteristic, c-statistic, likelihood ratios) may be included but are less informative.
- Studies should also report reclassification of diagnostic or risk category.

Clinically Valid
A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Systematic Reviews
The 4 cardinal diagnostic features of RLS include 1) an urge to move the limbs (this is usually associated with paresthesias or dysesthesias), 2) symptoms that start or worsen with rest, 3) at least partial relief of symptoms with physical activity, and 4) worsening of symptoms in the evening or at night. (3) Evidence reviewed by AASM included a case-control study that found RLS patients, when compared with controls, had reduced total sleep time, reduced sleep efficiency, prolonged sleep latencies, decreased slow-wave sleep, and increased nocturnal awakening.

Clinically Useful
A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from RCTs. No relevant TRCs were identified.

Chain of Evidence
Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

Because the principal symptoms of RLS occur during wake, RLS does not require PSG for diagnosis, except where uncertainty exists in the diagnosis. (1, 4) RLS frequently also has a primary motor symptom that is characterized by the occurrence of periodic limb movements during sleep. Periodic limb movements occur in 80% to 90% of patients who have RLS and support the diagnosis of RLS.

Section Summary: Restless Legs Syndrome
A case-control study has shown that RLS impairs PSG measures of sleep; however, the principal symptoms of RLS occur during wake and, therefore, the disorder does not require PSG for diagnosis.

Periodic Limb Movement Disorder
Clinical Context and Test Purpose
The purpose of PSG is to provide a diagnostic option that is an alternative to or an improvement on existing tests in individuals with periodic limb movement disorder (PLMD).

The following PICO was used to select literature to inform this policy.

Populations
The population of interest is individuals with PLMD.

Interventions
The test being considered is PSG. PSG records multiple physiologic parameters relevant to sleep. Video recording may also be performed during PSG to assess parasomnias such as RBD.

Comparators
Comparators of interest include clinical diagnosis alone.

Outcomes
The general outcomes of interest are test accuracy, symptoms, functional outcomes, and QOL as well as results of PSG.

Study Selection Criteria
Below are selection criteria for studies to assess whether a test is clinically valid.
- The study population represents the population of interest. Eligibility and selection are described.

- The test is compared with a credible reference standard.
- If the test is intended to replace or be an adjunct to an existing test; it should also be compared with that test.
- Studies should report sensitivity, specificity, and predictive values. Studies that completely report true- and false-positive results are ideal. Studies reporting other measures (e.g., receiver operating characteristic, area under receiver operating characteristic, c-statistic, likelihood ratios) may be included but are less informative.
- Studies should also report reclassification of diagnostic or risk category.

Clinically Valid

A test must detect the presence or absence of a condition, the risk of developing a condition in the future, or treatment response (beneficial or adverse).

Systematic Reviews

The evidence reviewed by Chesson et al. (1997) for AASM suggested difficulty in diagnosing PLMD without PSG. (4) In a series of 123 patients evaluated for chronic insomnia, a PLMD diagnosis was confirmed in 5 patients and discovered with PSG in another 10 patients. The PLMD scale from a sleep questionnaire had low sensitivity and specificity. Actigraphy, evoked potentials, and blink reflexes have been found to have little diagnostic specificity or utility. PSG-based diagnosis of PLMD correlated best with frequent awakening at night. In a series of 1171 patients who had PSG at 1 sleep disorders center, 67 (6%) patients had PLMD as the primary and sole sleep diagnosis. The mean sleep efficiency was 53%, and daytime sleepiness was reported by 60% of the cohort. The PLMD patients reported disturbed sleep during a mean of 4 nights per week for a mean of 7 years.

Clinically Useful

A test is clinically useful if the use of the results informs management decisions that improve the net health outcome of care. The net health outcome can be improved if patients receive correct therapy, or more effective therapy, or avoid unnecessary therapy, or avoid unnecessary testing.

Direct Evidence

Direct evidence of clinical utility is provided by studies that have compared health outcomes for patients managed with and without the test. Because these are intervention studies, the preferred evidence would be from RCTs. No relevant RCTs were identified.

Chain of Evidence

Indirect evidence on clinical utility rests on clinical validity. If the evidence is insufficient to demonstrate test performance, no inferences can be made about clinical utility.

PLMD can be diagnosed in the following cases: during PSG; during a subjective perception of poor sleep in the absence of RLS; or during a sleep-related breathing disorder. (3)

Section Summary: Periodic Limb Movement Disorder

The evidence for use of PSG for diagnosing PLMD includes a systematic review that concluded the diagnosis of PLMD is difficult without PSG. The review found low diagnostic accuracy of a sleep questionnaire or actigraphy, while a PSG-based diagnosis of PLMD correlated best with awakening at night.

Summary of Evidence

For individuals who have suspected hypersomnia who receive polysomnography (PSG), the evidence includes a systematic review on diagnostic accuracy. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. The evidence has suggested that PSG followed by the multiple sleep latency test is associated with moderate sensitivity and high specificity in support of the diagnosis of narcolepsy. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have typical or benign parasomnia who receive PSG, the evidence includes systematic reviews of studies on diagnostic accuracy and controlled cohort studies. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. The evidence has suggested that typical and benign parasomnias (e.g., sleepwalking, sleep terrors) may be diagnosed based on their clinical features and do not require PSG. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have violent or potentially injurious parasomnia who receive PSG, the evidence includes systematic reviews of studies on diagnostic accuracy and controlled cohort studies. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. For the diagnosis of rapid eye movement (REM) sleep behavior disorder, the combined use of clinical history and PSG to document the loss of muscle tone during REM sleep increases diagnostic accuracy and is considered the criterion standard for diagnosis. Diagnostic accuracy is increased with video recording during PSG to assess parasomnias such as REM sleep behavior disorder. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have restless legs syndrome who receive PSG, the evidence includes systematic reviews of studies on diagnostic accuracy and controlled cohort studies. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. Restless legs syndrome does not require PSG because the syndrome is a sensorimotor disorder, the symptoms of which occur predominantly when awake; therefore, PSG results are generally not useful. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals who have periodic limb movement disorder who receive PSG, the evidence includes a systematic review. Relevant outcomes are test accuracy, symptoms, functional outcomes, and quality of life. PSG with electromyography of the anterior tibialis is the only method available to diagnose periodic limb movement disorder, but this sleep-related movement disorder is rare and should only be evaluated using PSG in the absence of symptoms

of other disorders. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

Practice Guidelines and Position Statements

American Academy of Sleep Medicine

The American Academy of Sleep Medicine (AASM; 2005) published practice parameters for polysomnography (PSG) and related procedures. (1) AASM made the following recommendations on the use of PSG for non-respiratory indications (see Table 1).

Table 1. Practice Parameters on PSG for Non-Respiratory Indications

Recommendation	Grade
Polysomnography and a multiple sleep latency test performed on the day after the polysomnographic evaluation are routinely indicated in the evaluation of suspected narcolepsy.	Standard
Common, uncomplicated, noninjurious parasomnias, such as typical disorders of arousal, nightmares, enuresis, sleeptalking, and bruxism, can usually be diagnosed by clinical evaluation alone.	Standard
Polysomnography is not routinely indicated in cases of typical, uncomplicated, and noninjurious parasomnias when the diagnosis is clearly delineated.	Option
A clinical history, neurologic examination, and a routine EEG obtained while the patient is awake and asleep are often sufficient to establish the diagnosis and permit the appropriate treatment of a sleep-related seizure disorder. The need for a routine EEG should be based on clinical judgment and the likelihood that the patient has a sleep-related seizure disorder.	Option
Polysomnography is not routinely indicated for patients with a seizure disorder who have no specific complaints consistent with a sleep disorder.	Option
Polysomnography is indicated when evaluating patients with sleep behaviors suggestive of parasomnias that are unusual or atypical because of the patient's age at onset; the time, duration or frequency of occurrence of the behavior; or the specifics of the particular motor patterns in question.	Guideline
Polysomnography … is indicated in evaluating sleep-related behaviors that are violent or otherwise potentially injurious to the patient or others.	Option
Polysomnography may be indicated in situations with forensic considerations (e.g., if onset follows trauma or if the events themselves have been associated with personal injury).	Option
Polysomnography may be indicated when the presumed parasomnia or sleep-related seizure disorder does not respond to conventional therapy.	Option
Polysomnography is indicated when a diagnosis of periodic limb movement disorder is considered because of complaints by the patient or an observer of repetitive limb movement during sleep and frequent awakenings, fragmented sleep, difficulty maintaining sleep, or excessive daytime sleepiness.	Standard

Intra-individual night-to-night variability exists in patients with periodic limb movement sleep disorder, and a single study might not be adequate to establish this diagnosis.	Option
Polysomnography is not routinely indicated to diagnose or treat restless legs syndrome, except where uncertainty exists in the diagnosis.	Standard
Polysomnography is not routinely indicated for the diagnosis of circadian rhythm sleep disorders.	Standard

EEG: electroencephalography; PSG: polysomnography.

The AASM (2012) published practice parameters on non-respiratory indications for PSG and multiple sleep latency testing in children. (8) Table 2 lists recommendations for PSG and multiple sleep latency testing.

Table 2. Practice Parameters on PSG for Non-Respiratory Indications in Children

Recommendation	Grade
PSG is indicated for children suspected of having PLMD for diagnosing PLMD.	Standard
The MSLT, preceded by nocturnal PSG, is indicated in children as part of the evaluation for suspected narcolepsy.	Standard
Children with frequent NREM parasomnias, epilepsy, or nocturnal enuresis should be clinically screened for the presence of comorbid sleep disorders, and polysomnography should be performed if there is a suspicion for sleep-disordered breathing or periodic limb movement disorder.	Guideline
The MSLT, preceded by nocturnal PSG, is indicated in children suspected of having hypersomnia from causes other than narcolepsy to assess excessive sleepiness and to aid in differentiation from narcolepsy.	Option
The polysomnogram using an expanded EEG montage is indicated in children to confirm the diagnosis of an atypical or potentially injurious parasomnia or differentiate a parasomnia from sleep-related epilepsy when the initial clinical evaluation and standard EEG are inconclusive.	Option
Polysomnography is indicated in children suspected of having RLS who require supportive data for diagnosing RLS.	Option
Polysomnography is not routinely indicated for evaluation of children with sleep-related bruxism.	Standard

EEG: electroencephalography; MSLT: multiple sleep latency test; NREM: non–rapid eye movement; PLMD: periodic limb movement disorder; PSG: polysomnography; RLS: restless legs syndrome.

The AASM (2012) issued a practice parameter on the treatment of RLS and periodic limb movement disorder in adults. (3) The practice parameter noted different treatment efficacy measures are used to assess RLS due to its multifaceted nature. Measures included a number of subjective scales; the only objective measurements were sleep-related parameters by PSG or actigraphy.

The AASM (2010) issued a position paper on the treatment of nightmare disorders in adults (classified as a parasomnia). (9) The AASM stated that overnight PSG is not routinely used to assess nightmare disorder but may be used to exclude other parasomnias or sleep-disordered breathing. PSG may underestimate the incidence and frequency of posttraumatic stress disorder-associated nightmares. In 2018, the AASM updated its position paper, however there was no mention of PSG. (10)

The AASM (2023) issued best practice guidelines on the treatment of rapid eye movement (REM) sleep behavior disorder (RBD). (11) All forms of RBD (primary, secondary, and drug-induced) are defined in the guideline as emergence of dream enactment with a documented elevation in REM sleep motor tone on PSG. In patients with secondary RBD, these findings occur in the context of an underlying disorder, and in patients with drug-induced RBD, they occur after starting or increasing the dose of a serotonergic medication. PSG was mentioned in the context of treatment selection, since pramipexole was noted to be most effective among patients with periodic limb movements seen on PSG.

International RBD Study Group

The Neurophysiology Working Group of the International RBD Study Group (IRBDSG) (2022) issued guidelines on video PSG (v-PSG) procedures for the diagnosis of RBD. (12) The working group states that video PSG "is mandatory to diagnose RBD, following technical requirements for sleep recording described in Technical Requirements for v-PSG Recording section and scoring REM sleep as described in REM Sleep Scoring section and in the AASM manual." The group also states that video PSG is mandatory to identify prodromal RBD.

Ongoing and Unpublished Clinical Trials

A search of clinicaltrials.gov in May 2024 did not identify any ongoing or unpublished trials that would likely influence this policy.

Coding

Procedure codes on Medical Policy documents are included **only** as a general reference tool for each policy. **They may not be all-inclusive.**

The presence or absence of procedure, service, supply, or device codes in a Medical Policy document has no relevance for determination of benefit coverage for members or reimbursement for providers. **Only the written coverage position in a Medical Policy should be used for such determinations.**

Benefit coverage determinations based on written Medical Policy coverage positions must include review of the member's benefit contract or Summary Plan Description (SPD) for defined coverage vs. non-coverage, benefit exclusions, and benefit limitations such as dollar or duration caps.

CPT Codes	95805, 95808, 95810, 95811, 95782, 95783
HCPCS Codes	None

*Current Procedural Terminology (CPT®) ©2023 American Medical Association: Chicago, IL.

References

1. Kushida CA, Littner MR, Morgenthaler T, et al. Practice parameters for the indications for polysomnography and related procedures: an update for 2005. Sleep. Apr 2005; 28(4):499-521. PMID 16171294
2. Aurora RN, Zak RS, Maganti RK, et al. Best practice guide for the treatment of REM sleep behavior disorder (RBD). J Clin Sleep Med. Feb 15 2010; 6(1):85-95. PMID 20191945
3. Aurora RN, Kristo DA, Bista SR, et al. The treatment of restless legs syndrome and periodic limb movement disorder in adults--an update for 2012: practice parameters with an evidence-based systematic review and meta-analyses: an American Academy of Sleep Medicine Clinical Practice Guideline. Sleep. Aug 01 2012; 35(8):1039-1062. PMID 22851801
4. Chesson AL, Ferber RA, Fry JM, et al. The indications for polysomnography and related procedures. Sleep. Jun 1997; 20(6):423-487. PMID 9302726
5. Drakatos P, Marples L, Muza R, et al. Video polysomnographic findings in non-rapid eye movement parasomnia. J Sleep Res. Apr 2019; 28(2):e12772. PMID 30295353
6. Neikrug AB, Ancoli-Israel S. Diagnostic tools for REM sleep behavior disorder. Sleep Med Rev. Oct 2012; 16(5):415-429. PMID 22169258
7. Goldstein CA. Parasomnias. Dis Mon. Jul 2011; 57(7):364-388. PMID 21807161
8. Aurora RN, Lamm CI, Zak RS, et al. Practice parameters for the non-respiratory indications for polysomnography and multiple sleep latency testing for children. Sleep. Nov 01 2012; 35(11):1467-1473. PMID 23115395
9. Aurora RN, Zak RS, Auerbach SH, et al. Best practice guide for the treatment of nightmare disorder in adults. J Clin Sleep Med. Aug 15 2010; 6(4):389-401. PMID 20726290
10. Morgenthaler TI, Auerbach S, Casey KR, et al. Position paper for the treatment of nightmare disorder in adults: An American Academy of Sleep Medicine Position Paper. J Clin Sleep Med. Jun 15 2018; 14(6):1041-1055. PMID 29852917
11. Howell M, Avidan AY, Foldvary-Schaefer N, et al. Management of REM sleep behavior disorder: an American Academy of Sleep Medicine clinical practice guideline. J Clin Sleep Med. Apr 01 2023; 19(4):759-768. PMID 36515157
12. Cesari M, Heidbreder A, St Louis EK, et al. Video-polysomnography procedures for diagnosis of rapid eye movement sleep behavior disorder (RBD) and the identification of its prodromal stages: guidelines from the International RBD Study Group. Sleep. Mar 14 2022; 45(3). PMID 34694408

Centers for Medicare and Medicaid Services (CMS)

The information contained in this section is for informational purposes only. HCSC makes no representation as to the accuracy of this information. It is not to be used for claims adjudication for HCSC Plans.

The Centers for Medicare and Medicaid Services (CMS) does not have a national Medicare coverage position. Coverage may be subject to local carrier discretion.

A national coverage position for Medicare may have been developed since this medical policy document was written. See Medicare's National Coverage at <https://www.cms.hhs.gov>.

Policy History/Revision	
Date	**Description of Change**
11/15/2024	Document updated with literature review. Coverage unchanged. Reference 11 added.
01/01/2024	Reviewed. No changes.
01/15/2023	Document updated with literature review. The following changes were made to the Coverage section for periodic limb movement: 1) Removed "No other concurrent sleep disorder"; and 2) Replaced with "OSA has been excluded, or OSA has been adequately treated; and". References 10 and 11 were added.
09/15/2021	Reviewed. No changes.
11/15/2020	Document updated with literature review. Coverage unchanged. Reference 6 added.
09/15/2019	Reviewed. No changes.
01/01/2019	New medical document. Polysomnography (PSG) and a multiple sleep latency test performed on the day after the PSG may be considered medically necessary in the evaluation of suspected narcolepsy or idiopathic hypersomnia. PSG may be considered medically necessary when evaluating patients with parasomnias when there is a history of sleep-related injurious or potentially injurious disruptive behaviors. PSG may be considered medically necessary when a diagnosis of periodic limb movement disorder is considered when there is: 1) A complaint of repetitive limb movement during sleep by the patient or an observer; and 2) No other concurrent sleep disorder; and 3) At least one of the following is present: frequent awakenings, fragmented sleep, difficulty maintaining sleep, or excessive daytime sleepiness. PSG for the diagnosis of periodic limb movement disorder is considered not medically necessary when there is concurrent untreated obstructive sleep apnea, restless legs syndrome, narcolepsy, or rapid eye movement sleep behavior disorder. PSG is considered experimental, investigational and/or unproven for the diagnosis of non-respiratory sleep disorders not meeting the criteria above, including but not limited to nightmare disorder, depression, sleep-related bruxism, or noninjurious disorders of arousal.