Name of Policy: 
Polysomnography/Sleep Disorders Testing

Policy #: 305  Latest Review Date: June 2014
Category: Medicine  Policy Grade: C

Background/Definitions:
As a general rule, benefits are payable under Blue Cross and Blue Shield of Alabama health plans only in cases of medical necessity and only if services or supplies are not investigational, provided the customer group contracts have such coverage.

The following Association Technology Evaluation Criteria must be met for a service/supply to be considered for coverage:

1. The technology must have final approval from the appropriate government regulatory bodies;
2. The scientific evidence must permit conclusions concerning the effect of the technology on health outcomes;
3. The technology must improve the net health outcome;
4. The technology must be as beneficial as any established alternatives;
5. The improvement must be attainable outside the investigational setting.

Medical Necessity means that health care services (e.g., procedures, treatments, supplies, devices, equipment, facilities or drugs) that a physician, exercising prudent clinical judgment, would provide to a patient for the purpose of preventing, evaluating, diagnosing or treating an illness, injury or disease or its symptoms, and that are:

1. In accordance with generally accepted standards of medical practice; and
2. Clinically appropriate in terms of type, frequency, extent, site and duration and considered effective for the patient’s illness, injury or disease; and
3. Not primarily for the convenience of the patient, physician or other health care provider; and
4. Not more costly than an alternative service or sequence of services at least as likely to produce equivalent therapeutic or diagnostic results as to the diagnosis or treatment of that patient’s illness, injury or disease.
**Description of Procedure or Service:**
The present reference or “gold” standard for evaluation of sleep and sleep related breathing disorders (SRBDS) is the polysomnogram. Polysomnography requires an overnight stay in a sleep related breathing disorder laboratory or sleep disorder center and is the optimum test for diagnosing sleep apnea. It is distinguished from other sleep studies by the inclusions of an EEG, EOG, and submental EMG for the determination of sleep stage. It may also monitor the ventilation and respiratory effort, airflow, extremity muscle activity, motor-activity movement arterial oxygen saturation, and ECG or heart rate. Additional parameters which may be measured based on individual patient symptoms include such things as but not limited to esophageal reflux measurements, penile tumescence, continuous blood pressure, body positions, etc.

The testing facility may be either a sleep disorder center or a laboratory for sleep-related breathing disorders. A sleep disorders center is a medical facility providing clinical diagnostic services and treatment to patients who present with symptoms or features that suggest the presence of a sleep disorder. A sleep related breathing disorder laboratory provides diagnostic and treatment services limited to sleep-related breathing disorders, such as obstructive sleep apnea. The American Academy of Sleep Medicine provides standards and accreditation for sleep disorders centers and sleep related breathing disorder laboratories.

Abnormal breathing events commonly encountered in sleep include snoring, apneas, hypopneas, and respiratory effort related arousals. Sleep related breathing disorders are syndromes where the frequency of the breathing events is pathophysiologically linked to symptoms or adverse health outcomes. Some of the sleep related breathing disorders include obstructive sleep apnea (OSA), central sleep apnea, hypopnea, and upper airway resistance syndrome (UARS). Of these disorders, OSA is the most common.

Obstructive sleep apnea syndrome (OSA) is characterized by repetitive episodes of upper airway obstruction due to the collapse and obstruction of the upper airway during sleep. Obstruction anywhere along the upper airway can result in apnea, including the nasal cavity (nose), oropharynx (palate), and hypopharynx (tongue base). In patients with OSA, the normal pharyngeal narrowing is accentuated by anatomic factors, such as a short, fat “bull” neck, or large tonsillar pillars with redundant lateral pharyngeal wall mucosa. Furthermore, OSA may be associated with a wide variety of craniofacial abnormalities, including micrognathia, retrognathia, or maxillary hypoplasia. In addition, OSA is associated with obesity.

The hallmark clinical symptom of OSA is excessive snoring. The snoring abruptly ceases during the apneic episodes and during the brief period of patient arousal and then resumes when the patient again falls asleep. Sleep fragmentation associated with repeated arousal during sleep causes excessive daytime sleepiness that can lead to impairment of almost any daytime activity. For example, patients with OSA associated daytime somnolence are thought to be at a higher risk for accidents involving motorized vehicles, i.e., cars, trucks, or heavy equipment. In addition, excessive daytime sleepiness indirectly affects the cardiovascular and pulmonary systems. For example, apnea leads to periods of hypoxia, alveolar hypoventilation, hypercapnia, and acidosis. This in turn can cause systemic hypertension, cardiac arrhythmias, and cor pulmonale. Systemic hypertension is common in patients with OSA. Severe OSA is also associated with decreased
survival, presumably related to severe hypoxemia, hypertension, or an increase in automobile accidents related to daytime sleepiness.

In central sleep apnea, the message that is normally sent from the brain to the chest muscles to initiate breathing does not reliably occur during sleep. Upper airway resistance syndrome (UARS) is a variant of OSA that is characterized by a partial collapse of the airway, resulting in increased resistance to airflow. This increased respiratory effort required results in multiple sleep fragmentations as measured by very short alpha-electroencephalographic (EEG) arousals. Snoring may not be a feature of UARS. The resistance to airflow is typically subtle and does not result in apneic or hypopneic events. However, it does result in increasingly negative intrathoracic pressure during inspiration, which can be measured using an esophageal manometer as an adjunct to a polysomnogram. Therefore, this diagnosis rests on polysomnographic documentation of > 10 EEG arousals per hour of sleep correlated with episodes of reduced intrathoracic pressures.

OSA is often suspected on the basis of clinical history and physical and patient symptoms. The gold standard diagnostic test is considered a polysomnogram performed in a sleep laboratory. Polysomnography consists of monitoring and recording physiologic data during sleep. A standard polysomnogram, supervised by a lab technician, typically includes an EEG (to stage sleep, detect arousal); submental EMG (electromyogram); and EOG (electro-oculogram) (to detect arousal, rapid eye movement [REM] sleep). Additional parameters of sleep that may be measured include respiratory airflow and effort (to detect apnea), oxygen desaturation, ECG (electrocardiogram). In order to evaluate a patient for breathing related sleep disorders, it is important to identify the presence of apneas and hypopneas. Apnea is defined as the cessation of respiration for at least 10 seconds. The apnea index consists of the total number of apneic events per hour of sleep. Hypopnea in adult patients is defined as an abnormal respiratory event lasting at least 10 seconds with at least a 30% reduction in thoracoabdominal movement or airflow as compared to baseline and with at least a 4% oxygen desaturation or 3% desaturation from pre-event baseline or with an arousal. The total number of apneas and hypopneas per hour of sleep is referred to as the apnea-hypopnea index (AHI) or respiratory disturbance index (RDI). Levels of oxygen saturation are typically reported as the amount of time spent with oxygen saturation below a criterion level (such as 90%), the number of times oxygen drops below a certain level, or the mean and minimum levels of oxygen saturation or the number of times the O₂ saturation drops at least four percentage points.

The final diagnosis of OSA rests on a combination of objective and subjective criteria that seek to identify those levels of obstruction that are clinically significant. Mild sleep apnea is defined as an RDI between five (considered normal) and 14; moderate OSA is an RDI between 15 and 30; while severe OSA is an RDI > 30.

Excessive daytime sleepiness is predominantly a subjective symptom. The Epworth Sleepiness Scale (ESS) is a popular, quick, and easy self-administered questionnaire that asks patients their likelihood of falling asleep in eight situations ranked from 0 (would never doze) to three (high chance of dozing). The numbers are then added together to give a global score between 0 and 24. A value of 10 or below is considered normal. The eight situations are as follows:
1. Sitting and reading
2. Watching TV
3. As a passenger in a car for one hour without a break
4. Sitting inactive in a public place, i.e., theater
5. Lying down to rest in the afternoon when circumstances permit
6. Sitting and talking with someone
7. Sitting quietly after lunch without alcohol
8. In a car, while stopped for a few minutes in traffic

Medical management of OSA includes lifestyle modification, such as weight loss; avoidance of alcohol, sedatives and caffeine consumption, especially before bedtime; allowing adequate sleep time; body position during sleep (side vs. back); oral appliances; and positive airway pressure devices. There are various types of positive airway pressure devices, including CPAP, or continuous positive airway pressure, BiPAP, or bilevel positive airway pressure, DPAP, or demand positive airway pressure, and APAP, or auto-adjusting CPAP. On average, a 10% weight loss produces an improvement of 50% in the apnea-hypopnea index. Oral appliances act by holding the mandible and tongue forward during sleep. While this does not result in a cure, it can reduce the AHI. Some studies show a reduction rate of 50% in the AHI; however, compliance is a problem with these devices.

The need for diagnostic sleep studies should be confirmed by medical evidence. Trained medical professionals should be present whenever testing is performed. An attended or supervised study requires the constant presence of a trained individual who can monitor for technical adequacy, patient compliance, and relevant patient behavior. Home sleep studies should not be a duplication of previous testing performed by the attending physician to the extent that the results are still pertinent.

Narcolepsy is characterized by excessive daytime sleepiness with an increased propensity to fall asleep throughout the day. It manifests as an irresistible or uncontrollable urge to sleep, described as “sleep attacks”, with ESS scores of 15 or greater in untreated patients. Patients often present with other symptoms including cataplexy, hypnagogic hallucinations, or sleep paralysis and 90% of patients complain of disrupted nocturnal sleep. A primary diagnostic tool used when narcolepsy is suspected is the MSLT.

Multiple sleep latency testing (MSLT) involves repeated measurement of sleep latency, which is the time to the onset of sleep. The test is performed in the daytime under standardized and controlled conditions following quantified nocturnal sleep. Usually two to five tests are performed, one testing every two hours, to measure daytime sleep tendency. A mean latency of five minutes or less indicates severe excessive sleepiness. Maintenance of wakefulness test (MWT) is a similar diagnostic test. MWT also measures daytime sleepiness (narcolepsy). During MWT the patient has multiple trials throughout the day or low-demand activity when the instructions are to resist sleep. MSLT and MWT are performed on a day following polysomnography and performed at a specialized facility and are either monitored or observed by a trained technologist. Physiological recordings (similar to nighttime polysomnography), audio, and video recordings are also made during the monitored portion of the day. The data are
scored and analyzed by a trained technologist and the analysis is reviewed by the pulmonary or sleep medicine specialist or neurologist.

A full night polysomnography should last between six to seven hours. A split-night polysomnography can be an alternative for one full night PSG followed by a second night of titration. Split-night PSG entails CPAP titration when upon initial diagnostic PSG is followed by CPAP titration during PSG on the same night.

Restless legs syndrome (RLS) is a neurologic disorder characterized by disagreeable leg sensations that usually occur at rest or before sleep and are temporarily relieved by movement. Period limb movements (PLM) are involuntary, stereotypic, repetitive limb movements that may occur during sleep and usually involve the legs and possibly the arms.

SNAP Testing System is a type of reflective acoustic device home testing system marketed as a screening and analysis system to locate the source of snoring and detect sleep apnea conditions. This system does not require a technician and the data recorded is returned to the SNAP laboratory for analysis. Reports are faxed to the physician’s office along with a mailed hard copy

**Policy:**

**For dates of service on or after June 13, 2013:**

The use of an abbreviated daytime sleep study (PAP-NAP) as a supplement to standard sleep studies does not meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage and is considered investigational.

**Polysomnography or sleep disorders testing meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage when performed in an accredited sleep center or laboratory and interpreted by a board certified or board eligible sleep disorders specialist. The evaluation should include a thorough sleep history and a physical examination that includes the respiratory, cardiovascular, and neurological systems (AASM Practice Standard 4.1.1). This evaluation should take place before any polysomnography or sleep disorders testing is performed.

In addition to above, when performed in the Blue Cross and Blue Shield of Alabama Preferred Medical Doctor (PMD) service area, polysomnography or sleep disorders testing must be interpreted by PMD physician who is board certified or board eligible sleep disorders specialist, and must have an Alabama License in order to meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage.

Sleep studies performed outside of a health care facility, i.e., home sleep studies, whether supervised, attended, or not, are non-covered.

A supervised polysomnography or sleep study meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage as a diagnostic test in patients who present with pronounced snoring or restlessness in association with any one of the following:
1. Witnessed apneic events while sleeping (i.e., sleep apnea);
2. Excessive daytime sleepiness (defined as an Epworth sleepiness scale score of greater than 10);
3. Unexplained hypertension or arrhythmia;
4. Symptoms suggesting narcolepsy (e.g., sleep paralysis, hypnagogic hallucinations, and cataplexy);
5. Children seven years of age and under with one or more of the following:
   a. Observed gross or subtle snoring which may be continuous; cessation or difficulty breathing, and sleep disturbances, or;
   b. Observed symptoms related to cardio-pulmonary, growth and development, and/or behavior problems that may be caused by upper-airway obstruction.
6. Pronounced snoring or disrupted sleep

A supervised polysomnography must include all of the following:

1. Electroencephalography (EEG)
2. Electro-oculography (EOG)
3. Submental (or chin) electromyography (EMG)
4. Extremity muscle activity
5. Respiratory effort
6. Airflow
7. Arterial oxygen saturation
8. Electrocardiography (ECG) or heart rate

A supervised polysomnography or sleep study meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage as a technique to initiate or titrate CPAP in patients with clinically significant OSA defined as those patients who meet any of the following criteria:

1. An AHI ≥ 15; OR
2. An AHI between 5 and 14 with any of the following associated symptoms:
   a. Excessive daytime sleepiness (as evidenced by a pre-testing Epworth score of >10 or other evidence);
   b. Impaired cognition;
   c. Mood disorders;
   d. Insomnia;
   e. Documented hypertension;
   f. Ischemic heart disease;
   g. History of stroke.

Split-night polysomnography meets Blue Cross and Blue Shield of Alabama’s medical criteria for coverage as recommended by the American Academy of Sleep Medicine (AASM) Standards of Practice Committee (see Key Points).

Two separate full night (six to seven hours) polysomnography studies, one for the diagnosis of sleep disorders and the second to titrate CPAP meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage when circumstances are such that a split-night polysomnography with titration of CPAP performed in the second part of the study is not
possible. For example, significant obstructive sleep apnea is not identified in time to allow for at least three hours of CPAP titration including both REM and non-REM sleep.

**Polysomnography with video recording and additional EEG channels (Video-EEG-NPSG) in an extended bilateral montage meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage to assist with the diagnosis of paroxysmal arousals or sleep disturbances thought to be seizure related when the initial clinical evaluation and results of the standard EEG are inconclusive.

**Polysomnography meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage for the evaluation of sleep disorders for the following indications **when diagnostic questions remain after completion of the standard evaluation**, when treatment decisions will be made based on the results of the study, and when the symptoms are of a severity to place the individual at risk for serious complications or injury:

1. Patients with neuromuscular disorders and sleep-related symptoms;
2. Assist with the diagnosis of paroxysmal arousal or other sleep disturbances thought to be seizure related;
3. Sleep-related epilepsy that does not respond to conventional therapy;
4. Infant or child under the age of seven years who is being considered for removal of a tracheostomy;
5. Infant or child under the age of seven years with suspected Ondine’s Curse (Central Alveolar Hypoventilation Syndrome) in which the patient stops breathing when they sleep;
6. Unexplained hypersomnolence;
7. Complicated/injurious parasomnias;
8. Periodic limb movement disorder; restless leg syndrome;
9. Central nervous system hypoventilation;

**Multiple Sleep Latency Test (MSLT) / Maintenance Wakefulness Test (MWT) meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage as a diagnostic tool to evaluate suspected narcolepsy or idiopathic hypersomnolence. MSLT / MWT are performed after a polysomnography has ruled out significant sleep apnea (as indicated by a RDI < 10). Initial PSG and MSLT occasionally fail to identify narcolepsy. Repeat testing may be necessary when initial results are negative or ambiguous and the clinical history strongly indicates a diagnosis of narcolepsy. Repeat MSLT / MWT may also be performed when the response to treatment needs to be evaluated.

A **repeat supervised polysomnography or sleep study meets** Blue Cross and Blue Shield of Alabama’s medical criteria for coverage in patients who meet the following criteria:

1. After good clinical response to oral appliance treatment in patients with moderate to severe OSA, to ensure therapeutic benefit;
2. After surgical treatment of patients with moderate-to-severe OSA, to ensure satisfactory response;
3. After surgical or dental treatment of patients with SRBDs whose symptoms return despite a good initial response to treatment;
4. After substantial weight loss (e.g., 10% of body weight) has occurred in patients on CPAP for treatment of SRBDS to ascertain whether CPAP is still needed at the previously titrated pressure;
5. After substantial weight gain (e.g., 10% body weight) has occurred in patients previously treated with CPAP successfully, who are again symptomatic despite the continued use of CPAP, to ascertain whether pressure adjustments are needed;
6. When clinical response is insufficient or when symptoms return despite a good initial response to treatment with CPAP. In these circumstances, testing should be devised with consideration that a concurrent sleep disorder may be present (e.g., OSA and narcolepsy). (AASM, 2005).

Diagnostic sleep testing for the following conditions does not meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage as they can be diagnosed through more appropriate means:
1. Bruxism;
2. Drug dependency;
3. Enuresis;
4. Hypersomnia, without other signs/symptoms of OSA;
5. Insomnia;
6. Night terrors or dream anxiety attacks;
7. Nocturnal myoclonus;
8. Routine diagnosis of restless leg syndrome, periodic limb movements;
9. Shift work and schedule disturbances;
10. Somnambulism;
11. Migraine headaches;
12. Snoring without other signs/symptoms of OSA;
13. Chronic obstructive pulmonary disease;
14. Asthma;
15. Neuromuscular disease;
16. Depression;
17. Determining risk of sudden infant death syndrome (SIDS);
18. Circadian rhythm sleep disorders.

The following types of sleep studies or tests related to sleep studies do not meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage:

1. Unattended or unsupervised sleep studies;
2. Home or portable sleep studies; whether attended or unattended have not been conclusively proven to be equivalent to formal sleep studies in a sleep lab;
3. Electrosleep therapy, which uses the passage of weak electric currents to the brain to induce sleep;
4. Topographic electroencephalogram (EEG) mapping for the diagnosis and/or medical management of obstructive sleep apnea syndrome;
5. Multiple sleep latency testing (MSLT) for the diagnosis of obstructive sleep apnea syndrome. This test may be used in the diagnostic work up of narcolepsy;
6. Actigraphy (refer to Blue Cross and Blue Shield of Alabama’s Medical Policy # 164 Wrist Actigraphy Home Monitoring);
7. Acoustic pharyngometers (e.g., Eccovision™ Acoustic Pharyngometer);
8. Reflective acoustic devices (e.g., SNAP™ Testing System or Bedbugg testing);
9. Obstructive pressure measuring (e.g. ApLab testing).

Follow-up polysomnography does not meet Blue Cross and Blue Shield of Alabama’s medical criteria for coverage in the following conditions:

- Patients treated with CPAP whose symptoms continue to be resolved with CPAP treatment.

Blue Cross and Blue Shield of Alabama does not approve or deny procedures, services, testing, or equipment for our members. Our decisions concern coverage only. The decision of whether or not to have a certain test, treatment or procedure is one made between the physician and his/her patient. Blue Cross and Blue Shield of Alabama administer benefits based on the member’s contract and corporate medical policies. Physicians should always exercise their best medical judgment in providing the care they feel is most appropriate for their patients. Needed care should not be delayed or refused because of a coverage determination.

Key Points:
In 2005, leaders from the American Thoracic Society (ATS), the American College of Chest Physicians (ACCP), and the American Academy of Sleep Medicine (AASM) met to address means by which the three societies could work together to enhance patient care with respect to the practice of sleep medicine. The three societies reaffirm the essential role of all specialties that have been key participants in the development of sleep medicine, including pulmonology, neurology, psychiatry, otolaryngology, pediatrics, and internal medicine. The Sleep Medicine Certification Program, developed by the American Board of Internal Medicine (ABIM), the American Board of Family Medicine (ABFM), the American Board of Psychiatry and Neurology (ABPN), the American Board of Pediatrics (ABP), and the American Board of Otolaryngology (ABOto) for diplomates in internal medicine, family medicine, psychiatry and neurology, pediatrics, and otolaryngology is designed to recognize excellence among physicians who are specialists in the care of patients with sleep problems and specific sleep disorders.

There are three pathways that qualify physicians to sit for the new examination: 1) certification by one of the primary sponsoring boards and the current American Board of Sleep Medicine (ABSM); 2) certification by one of the primary sponsoring boards and completion of training in a 1-year sleep medicine fellowship program, not overlapping with any other residency or fellowship; and 3) clinical practice experience: this clinical practice experience pathway consists of a five-year "grandfathering" period open to physicians who are board certified in one of the sponsoring specialty boards and who can attest that he or she has the equivalent of one year of clinical practice experience in sleep medicine during the prior five years. This experience could, for example, be gained by an individual practitioner who has devoted one third of his or her
practice to sleep medicine over three years, or by someone who spent 25% of their practice in the field over the past four years. Physicians in the clinical practice pathway will also have to attest to a specified minimum number of patients seen and polysomnograms and multiple sleep latency tests read. At the end of this initial five-year period, the only route to board eligibility will be through an accredited fellowship training program. This creates a one-time, unprecedented opportunity for pulmonologists, neurologists, psychiatrists, and other physicians already working in the field to sit for the board examination.

The patient selection criteria for a polysomnogram or sleep study require an estimate of the pretest probability of OSA, based on the signs and symptoms of OSA. Ideally, one would like to know the necessity of a polysomnogram (i.e., with EEG) versus a sleep study (without EEG). In 1997, the American Sleep Disorders Association published practice parameters for polysomnography and related procedures. These parameters suggested that patient had a 70% likelihood of having an AHI index of at least 10 if all of the following were present: habitual snoring, excessive daytime sleepiness, a body mass index > 35, and observed apneas. The document further stated that in these patients, a sleep study may be an acceptable alternative to a polysomnogram. However, a sleep study may only “rule in” disease, and polysomnography should be available for patients with false negative sleep studies. In addition, the document suggests that a history of excessive daytime sleepiness and heavy snoring should prompt consideration of a polysomnogram. Finally, practice parameters state that a multiple sleep latency test is not routinely indicated for most patients with sleep-related breathing disorders.

In 2003, a joint project of the American Academy of Sleep Medicine (AASM), the American Thoracic Society, and the American College of Chest Physicians developed revised practice parameters for the use of portable monitoring (PM) devices. Portable devices encompass the entire range of devices except for comprehensive laboratory-based polysomnography. Type 2 devices are portable comprehensive polysomnography devices and Type 3 and 4 devices are sleep study devices. Their recommendations were as follows:

1. The clinical use of Type 2 PM devices in the attended or unattended setting is not recommended to evaluate patients with suspected OSA because of a lack of published evidence.
2. The use of some Type 3 PM devices in an attended setting can be used to increase the probability that the patient has an AHI > 15. The use of Type 3 PM devices in an unattended setting is not recommended.
3. All possible uses of Type 4 devices in both the attended and unattended setting were not recommended.

An additional recommendation of note is that sleep studies are not recommended in patients with comorbid conditions or secondary sleep complaints.

There were two recent studies that looked at the use of CPAP to diagnose sleep apnea prior to polysomnography. These are summarized below.

Senn, et al (2006), reported on a study that evaluated whether the diagnosis of sleep apnea could be inferred from the response to a treatment trial of nasal CPAP. Sixty-seven sleepy snorers
were treated with CPAP for two weeks and the result was positive if the patient had used CPAP for > two hours per night and wished to continue therapy. Polysomnography was performed for validation. Forty-four of 76 patients (58%) had sleep apnea as confirmed by an AHI > 10/h. The CPAP trial predicted sleep apnea with a sensitivity of 80%, a specificity of 97%, and a PPV of 97% and NPV of 78%. In 35 of 76 sleep apnea patients (46%) with positive CPAP trial results, polysomnography could have been avoided.

Mulgrew, et al (2007), reported the results of a randomized, controlled, open-label trial that compared standard PSG with ambulatory CPAP titration in high risk patients identified by a diagnostic algorithm. Sixty-eight patients with a high pretest probability of moderate to severe OSA (AHI > 15 episodes/h) were randomly assigned to PSG or ambulatory titration using auto-CPAP and overnight oximetry and were observed for three months. The results showed there was no difference in the primary outcome, AHI on CPAP (3.2 vs. 2.5), between the PSG and ambulatory groups, or in the secondary outcomes EES score, sleep apnea Quality of Life index, and CPAP. They concluded that in the initial management of patients with a high probability of OSA, PSG confers no advantage over the ambulatory approach in terms of diagnosis and CPAP titration.

Garcia-Diaz et al (2007) assessed the sensitivity and specificity of home respiratory polygraphy and actigraphy to diagnose OSA in relation to laboratory PSG. The cohort consisted of 65 consecutive patients referred to the sleep laboratory for PSG because of suspected OSA. Using an AHI cutoff of 15 or more, two independent evaluators were found to identify PSG-defined OSA in 90% to 92% of the patients (sensitivity of 84% - 88% and specificity of 97%). Analysis of data from the Swiss respiratory polygraphy registry found that in patients selected for portable monitoring (based on high clinical suspicion of OSA by licensed pulmonary physicians by a combination of hypersomnolence, snoring or observed apneas), confirmation or exclusion of sleep disordered breathing was possible in 96% of the 8,865 diagnostic sleep studies. From these Type 3 studies (four channels including airflow and respiratory movement, heart rate or electrocardiogram [ECG], and oxygen saturation), 3.5% were not conclusive and required additional PSG.

Polysomnography for children is based on the American Academy of Pediatrics Clinical Practice Guideline: Diagnosis and Management of Childhood Obstructive Sleep Apnea Syndrome. The guideline is to serve as a source for primary care physicians regarding decision making when evaluating children for possible obstructive sleep apnea. This guideline states that all children should be screened for snoring; patients that are considered as high-risk, complex, should be referred to a specialist; those with cardio-respiratory failure require immediate referral; polysomnography is used to discriminate between primary snoring and obstructive sleep apnea; removal of tonsils and adenoids is usually the first line of treatment; high-risk patients should be monitored closely postoperatively and reevaluated to determine the need for additional treatment, if any.

Split-night polysomnography studies have been touted to improve waiting time, costs and provide for better efficiency. Drawbacks to split-night studies include situations of a patient having difficulty falling asleep, testing time can be dramatically reduced, resulting insufficient data. It can also be more difficult to get an accurate portrait of sleep patterns as early
in sleep the condition may appear mild but as the study progresses the condition worsens. There could be limits in different positions for evaluation of the occurrence of apneas with REM sleep. Reduced titration time may also be a problem which can decrease time for adjustment to CPAP and incorrect settings indicating the need for a second night study for appropriate CPAP titration. Jorquera et al concluded from their study to assess if CPAP pressure can be adequately titrated in patients with OSA using split-night polysomnography that adequate CPAP pressure can be titrated in 80% of patients subjected to split-night PSG.

For CPAP titration, a split-night study (initial diagnostic polysomnogram followed by CPAP titration during polysomnography on the same night) is an alternative to one full night of diagnostic polysomnography followed by a second night of titration. The AASM Standards of Practice Committee specifies the following four criteria for the use of split-night testing:

1. An AHI of at least 40 is documented during a minimum of two hours of diagnostic polysomnography. Split-night studies may sometimes be considered at an AHI of 20 to 40, based on clinical judgment (e.g., if there are also repetitive long obstructions and major desaturations);
2. CPAP titration is carried out for more than three hours (because respiratory events can worsen as the night progresses);
3. Polysomnography documents that CPAP eliminates or nearly eliminates the respiratory events during REM and non-REM (NREM) sleep, including REM sleep with the patient in the supine position;
4. A second full night of polysomnography for CPAP titration is performed if the diagnosis of a sleep-related breathing disorder is confirmed but criteria 2 and 3 are not met.

In the 2005 update of Practice Parameters for the Indications for Polysomnography and Related Procedures, the AASM lists the use of PSG with additional EEG derivations in an extended bilateral montage, and video recording, as being recommended to assist with the diagnosis of paroxysmal arousals or other sleep disruptions that are thought to be seizure related when the initial clinical evaluation and results of a standard EEG are inconclusive.

Polysomnography may be indicated in the following indications per the AASM: in situations with forensic considerations, (e.g., if onset follows trauma or the events themselves have been associated with personal injury): or may be indicated when the presumed parasomnia or sleep related seizure disorder does not respond to conventional therapy.

Periodic Limb Movement disorder (PLMD) is characterized by PLMs that cause frequent arousals and lead to insomnia or excessive daytime sleepiness. Evaluations should include a clinical history and physical examination, lab studies that will help to rule out other conditions that are similar to Restless Leg Syndrome or PLMD. Clinical history should include bed partner observation. Validated NIH criteria can be used to establish the diagnosis of RLSDS. Polysomnography may be indicated when a diagnosis of periodic limb movement disorder is possible because of complaints by the patient or an observer of repetitive limb movements during sleep and frequent awakenings, fragmented, sleep, difficulty maintaining sleep. (AASM, 2005)
The AASM states polysomnography is not routinely indicated to diagnose or treat restless leg syndrome.

AASM issued the following standard regarding Multiple Sleep Latency Test (MSLT) and Maintenance Wakefulness Test (MWT). To provide a valid assessment of sleepiness or wakefulness the MSLT and MWT must be performed under appropriate conditions using proper recording techniques and accepted protocols by a qualified and experienced clinician. MSLT is indicated as part of the evaluation of patients with suspected narcolepsy to confirm the diagnosis. MSLT is not routinely indicated in the initial evaluation and diagnosis of obstructive sleep apnea syndrome or in assessment of change following treatment with nasal CPAP. The MWT 40 minute protocol may be used to assess an individual’s ability to remain awake when the inability to remain awake constitutes a public or personal safety issue. MWT may be indicated in patients with excessive sleepiness to assess response to treatment.

In 2004 Liesching et al published the results of a study to determine the accuracy of snoring and apnea analysis by SNAP, a technology that uses snoring recorded by home microphone system and nasal airflow, to diagnose obstructive sleep apnea as well as severity. Patients had undergone a prior SNAP study and the results were compared to standard polysomnography. The severity of sleep apnea as assessed by the SNAP study was confirmed by polysomnography in only 11 of 31 patients (35.5%). SNAP severity scores were overestimated in 13 of 31 patients (41.9%) compared to polysomnography results. In the majority of the subjects (8 of the 13), the SNAP study diagnosed OSA when the patient had a normal polysomnography finding. The authors concluded that although there may be some night-to-night variability in polysomnography testing, these results suggest that SNAP studies do not appear to accurately assess the severity of OSA. There has been much criticism of this article, with controversy regarding the testing methods etc. In February 2007, Galer et al published the results of their study focusing on the clinical significance of acoustic data recorded by the SNAP home polysomnography system. Results revealed snoring did not correlate with anthropometric variables such as body mass index and neck circumference. Statistical analysis showed no correlation between respiratory disturbance index and the maximum or average loudness of snoring. Average loudness was predictive of the presence of sleep apnea. The authors concluded that analysis of snoring has limited utility in the evaluation of the patient with sleep apnea but may be able to select patients who would benefit from palatal procedures to reduce snoring.

In 2009, a Clinical Guideline for the Evaluation, Management and Long-term Care of Obstructive Sleep Apnea in Adults was prepared by the Adult OSA Task Force of the AASM (Epstein, 2009). According to the AASM, “This task force was assembled to produce a clinical guideline from a review of existing practice parameters and available literature. All existing evidence-based AASM practice parameters relevant to the evaluation and management of OSA in adults were incorporated into this guideline. For areas not covered by the practice parameters, the task force performed a literature review and made consensus recommendation using a modified nominal group technique.” This document provides specific information regarding in-laboratory PSG, which aligns with the medical necessity criteria contained in this document. The following is excerpted from the AASM document specific to PSG and split-night testing:
Full night PSG is recommended for the diagnosis of a sleep related breathing disorder but a split-night study (initial diagnostic PSG followed by continuous positive airway pressure titration on the same night) is an alternative to the one full night of diagnostic PSG. The split-night study may be performed if an AHI ≥ 40/hr is documented during two hours of a diagnostic study but may be considered for an AHI of 20-40/hr based on clinical judgment. In patients where there is a strong suspicion of OSA, if other causes for symptoms have been excluded, a second diagnostic overnight PSG may be necessary to diagnose the disorder.

The diagnosis of OSA is confirmed if the number of obstructive events (apneas, hypopneas + respiratory event related arousals) on PSG is greater than 15 events/hr or greater than five/hour in a patient who reports any of the following: unintentional sleep episodes during wakefulness; daytime sleepiness; unrefreshing sleep; fatigue; insomnia; waking up breath holding, gasping, or choking; or the bed partner describing loud snoring, breathing interruptions, or both during the patient’s sleep. OSA severity is defined as mild for RDI ≥ 5 and < 15, moderate for RDI ≥ 15 and ≤ 30, and severe for RDI >30/hr (Consensus).

PAP-NAP

In 2008, Krakow et al. reported use of a daytime abbreviated sleep study to acclimate patients with complex insomnia to PAP. Patients had been referred by psychiatrists or primary care physicians for unspecified insomnia conditions, insomnia due to a mental disorder, or hypnotic dependence. Nearly all of these patients had anxiety, fear, and/or resistance regarding PAP therapy or the diagnosis of OSA. Thirty-nine patients who could not be persuaded to complete a titration protocol (full-night or split-night) were offered a daytime procedure (PAP-NAP) prior to night-time titration. The PAP-NAP protocol consisted of five components: pretest instructions to maximize chances for daytime napping; introduction of PAP therapy addressing barriers to use; Type 3 monitoring hookup (ten channels without EEG leads); PAP therapy during one to two hours in bed in which the patient has the possibility of falling asleep with the mask in place; and post-test follow-up. Thirty-five of 39 nap-tested patients subsequently scheduled and completed an overnight titration or split-night study with full PSG. The effect of the PAP-NAP intervention on compliance was compared to historical controls (n=38) with insomnia, mental health conditions, and OSA with resistance to CPAP who completed titration. A prescription for PAP therapy was filled by 85% of the PAP-NAP group compared with 35% of controls. Regular use during a 30-day period was recorded by the PAP device in 67% of the intervention group compared with 23% of controls. Adherence, defined as at least five days per week with an average of at least four hours per day, was 56% in the PAP-NAP group and 17% in controls.

This single study of PAP-NAP is not sufficient evidence to form conclusions on the efficacy of this approach in improving compliance with CPAP. The patient population was highly selected and the behavioral intervention may be dependent on the specific clinicians providing treatment. In addition, historical controls were used, and they were not well-matched to the study population. For these reasons, the internal validity and generalizability of the results are uncertain. Additional study is needed to evaluate the efficacy of this intervention with greater certainty.
The American Thoracic Society (ATS) published 2013 Guidelines on sleep apnea and driving risk in noncommercial drivers. ATS gives a strong recommendation (based on moderate quality evidence) for treatment of confirmed OSA with CPAP to reduce driving risk. ATS defines a high-risk driver as one who has moderate to severe daytime sleepiness and a recent unintended motor vehicle crash or a near-miss attributable to sleepiness, fatigue, or inattention. Weak recommendations (based on very low-quality evidence) were made for expeditious diagnostic evaluation for patients in whom there is a high clinical suspicion of OSA and against the use of stimulant medications or empiric CPAP to reduce driving risk.

**Key Words:**
Sleep study, polysomnography, polysomnogram, obstructive sleep apnea, central sleep apnea, hypopnea, Upper Airway Resistance Syndrome, narcolepsy, apnea hypopnea index, respiratory disturbance index (RDI), continuous positive airway pressure (CPAP), bilevel positive airway pressure (BiPAP), demand positive airway pressure (DPAP), Epworth Sleepiness Scale (ESS), split-night study

**Approved by Governing Bodies:**
Not applicable

**Benefit/Network Applications:**
In the PMD Network service area, sleep disorder services must be provided by a Plan approved sleep disorder center or laboratory. In order to be given consideration to become a Plan approved sleep disorder center or laboratory, the entity must be fully accredited by AASM.

The AASM offers a six-month provisional accreditation period in order for new facilities to meet all the standards required for full accreditation. Blue Cross and Blue Shield of Alabama will recognize one six-month provisional accreditation period only. Full AASM accreditation is required in order to be given consideration to become a Plan approved sleep disorder provider.

**Billing Information Regarding Location of Service**
Sleep labs located within a hospital or on the campus of a hospital (main campus, not offsite) should be billed as an Institutional (UB-92) claim for all technical services. The physician doing the professional work would submit a Professional (CMS-1500) claim.

If the hospital has a sleep lab at an off campus location (not on the main hospital campus) then it would qualify as a freestanding center (if it met all other requirements of a sleep lab). Then the services should be billed as a Professional (CMS-1500) claim and will be reimbursed a total global fee that would include all professional and technical components. The Professional (CMS-1500) claim must be filed under the name and provider number of the PMD interpreting physician.
If a sleep lab is a freestanding center and meets all requirements, then the services should be billed as a Professional (CMS-1500) claim and will be reimbursed a total global fee including all professional and technical services. The Professional (CMS-1500) claim must be filed under the name and provider number of the PMD interpreting physician.

Coverage is subject to member’s specific benefits. Group specific policy will supersede this policy when applicable.

ITS: Home Policy provisions apply
FEP contracts: Special benefit consideration may apply. Refer to member’s benefit plan.

**Current Coding:**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Effective Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>95782</td>
<td>Polysomnography; younger than 6 years, sleep staging with 4 or more additional parameters of sleep, attended by a technologist</td>
<td>Effective 01/01/2013</td>
</tr>
<tr>
<td>95783</td>
<td>Polysomnography; younger than 6 years, sleep staging with 4 or more additional parameters of sleep, with initiation of continuous positive airway pressure therapy or bi-level ventilation, attended by a technologist</td>
<td>Effective 01/01/2013</td>
</tr>
<tr>
<td>95800</td>
<td>Sleep study, unattended, simultaneous recording; heart rate, oxygen saturation, respiratory analysis (e.g., by airflow or peripheral arterial tone), and sleep time</td>
<td>Effective 01/01/2011</td>
</tr>
<tr>
<td>95801</td>
<td>Sleep study, unattended, simultaneous recording; minimum of heart rate, oxygen saturation, and respiratory analysis (e.g., by airflow or peripheral arterial tone)</td>
<td>Effective 01/01/2011</td>
</tr>
<tr>
<td>95803</td>
<td>Actigraphy testing, recording, analysis, interpretation, and report (minimum of 72 hours to 14 consecutive days of recording)</td>
<td>Effective 01/01/2009</td>
</tr>
<tr>
<td>95805</td>
<td>Multiple sleep latency or maintenance of wakefulness testing, recording, analysis and interpretation of physiological measurements of sleep during multiple trials to assess sleepiness</td>
<td></td>
</tr>
<tr>
<td>95806</td>
<td>Sleep study, unattended, simultaneous recording of, heart rate, oxygen saturation, respiratory airflow, and respiratory effort (e.g., thoracoabdominal movement)</td>
<td>Effective 01/01/2010</td>
</tr>
<tr>
<td>95807</td>
<td>Sleep study, simultaneous recording of ventilation, respiratory effort, ECG or heart rate, and oxygen saturation, attended by a technologist</td>
<td></td>
</tr>
<tr>
<td>95808</td>
<td>Polysomnography; any age, sleep staging with 1-3 additional parameters of sleep, attended by a technologist</td>
<td></td>
</tr>
<tr>
<td>95810</td>
<td>Polysomnography; age 6 years or older, sleep staging with 4 or more additional parameters of sleep, attended by a technologist</td>
<td></td>
</tr>
<tr>
<td>95811</td>
<td>Polysomnography; age 6 years or older, sleep staging with 4 or more additional parameters of sleep, with initiation of continuous positive airway pressure therapy or bilevel ventilation, attended by a technologist</td>
<td></td>
</tr>
<tr>
<td>95999</td>
<td>Unlisted neurological or neuromuscular diagnostic procedure</td>
<td></td>
</tr>
</tbody>
</table>
HCPCS:
  E1399  Durable medical equipment, miscellaneous
  G0398  Home sleep study test (HST) with type Ii portable monitor, unattended; minimum of 7 channels: EEG, EOG, EMG, ECG/heart rate, airflow, respiratory effort and oxygen saturation. (Effective 03/13/2008)
  G0399  Home sleep test (HST) with type III portable monitor, unattended; minimum of 4 channels: 2 respiratory movement/airflow, 1 ECG/heart rate and 1 oxygen saturation (Effective 03/13/2008)
  G0400  Home sleep test (HST) with type IV portable monitor, unattended; minimum of 3 channels (Effective 03/13/2008)

Previous Coding:
  0089T  Actigraphy Testing, Recording, analysis and interpretation (Minimum of three-day recording) (Deleted effective 01/01/2009)
  0203T  Sleep study, unattended, simultaneous recording; heart rate, oxygen saturation, respiratory analysis (e.g., by airflow or peripheral arterial tone) and sleep time (Deleted effective 01/01/2011)
  0204T  Sleep study, unattended, simultaneous recording; minimum of heart rate, oxygen saturation, respiratory analysis (e.g., by airflow or peripheral arterial tone) (Deleted effective 01/01/2011)

References:

Policy History:
Medical Policy Group, February 2007 (2)
Medical Policy Group, May 2007 (1, 2)
Medical Policy Administration Committee, May 2007
Available for comment May 26-July 9, 2007
Medical Policy Group, July 2007 (3)
Medical Policy Administration Committee, July 2007
Available for comment July 13-August 26, 2007
Medical Policy Group, August 2008 (3)
Medical Policy Administration Committee, September 2008
Available for comment September 8-October 22, 2008
Medical Policy Group, December 2008 (2)
Medical Policy Administration Committee, January 2009
Available for comment January 9-February 23, 2009
Medical Policy Group, June 2009 (3)
Medical Policy Administration Committee, June 2009
Coding update effective January 1, 2011, December 2010 (1): Added 2 new CPT codes for unattended sleep studies, 95800 & 95801, deleted 0203T and 0204T
Medical Policy Group, July 2011, Updated Key Points and References. Medical Policy Group, November 2012; 2013 Coding updates: Added Codes 95782 & 95783; changed the verbiage on Codes 95808, 95810, and 95811; all effective 1/1/13.
Medical Policy Panel, June 2013
Medical Policy Group, June 2013 (3): 2013 Updates to Policy statement, Key Points and References; added to policy statement the use of an abbreviated daytime sleep study (PAP-NAP) as a supplement to standard sleep studies as investigational
Medical Policy Administration Committee, August 2013
Available for comment July 31 through September 20, 2013
Medical Policy Panel, June 2014
Medical Policy Group, June 2014 (5): Policy updated with literature review; Updated key points and references; No change in Policy Statement.

This medical policy is not an authorization, certification, explanation of benefits, or a contract. Eligibility and benefits are determined on a case-by-case basis according to the terms of the member’s plan in effect as of the date services are rendered. All medical policies are based on (i) research of current medical literature and (ii) review of common medical practices in the treatment and diagnosis of disease as of the date hereof. Physicians and other providers are solely responsible for all aspects of medical care and treatment, including the type, quality, and levels of care and treatment.

This policy is intended to be used for adjudication of claims (including pre-admission certification, pre-determinations, and pre-procedure review) in Blue Cross and Blue Shield’s administration of plan contracts.