



CLINICAL GUIDELINES

Sleep Apnea and Treatment

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eviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist and/or individual's Primary Care Physician (PCP) may provide additional insight.

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Sleep Apnea Diagnosis and Treatment Guidelines

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Abbreviations for Sleep Apnea Guidelines

AASM	American Academy of Sleep Medicine
AHI	Apnea-Hypoxia Index: normal AHI < 5 mild OSA: AHI of ≥ 5 to ≤ 14 moderate OSA: AHI of ≥ 15 to ≤ 30 severe OSA: AHI of > 30
AOSATF of AASM	Adult Obstructive Sleep Apnea Task Force of the American Academy of Sleep Medicine
APAP	Autotitrating positive airway pressure
BMI	Body mass index (body weight divided by the square of the height)
CPAP	Continuous positive airway pressure
DOT	Department of Transportation
HCPCS	Healthcare Common Procedural Coding System (Level II alphanumeric codes used to report services not included in CPT®)
IDTF	Independent Diagnostic Testing Facilities
JCAHO	Joint Commission on Accreditation of Healthcare Organizations
MSLT	Multiple Sleep Latency Test
MWT	Maintenance of Wakefulness Test
OSA	Obstructive sleep apnea
PM	Portable monitoring (in home sleep studies)
PSG	Polysomnography
RDI	Respiratory disturbance index: (respiratory effort related arousals + apneas + hypopneas/total sleep time normal RDI < 5 mild OSA: RDI of ≥ 5 to ≤ 14 moderate OSA: RDI of ≥ 15 to ≤ 30 severe OSA: RDI of > 30
Screening Tools for Sleep Disorders	Epworth Sleepiness Scale, Berlin Questionnaire (for sleep apnea), STOP-BANG questionnaire, Insomnia Severity Index
OA	Oral appliance

SL-1: Obstructive Sleep Apnea

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SL-1.1: General Requirements

- Positive diagnosis of OSA, as measured by valid testing defined as:
 - ◆ The apnea-hypopnea index (AHI), respiratory disturbance index (RDI), respiratory event index (REI) is ≥ 15 events per hour; or
 - ◆ The AHI, RDI, or REI is ≥ 5 and ≤ 14 events per hour and documentation of:
 - Symptoms of sleepiness, nonrestorative sleep, fatigue, or insomnia
 - Report of awakening with breath holding, gasping, or choking
 - Bed partner or other observer reports habitual snoring, breathing interruptions, or both during sleep
 - Hypertension, a mood disorder, cognitive dysfunction, coronary artery disease, congestive heart failure, atrial fibrillation, type 2 diabetes mellitus, or stroke.
 - See **SL-7: Practice Notes** for additional information
- A current and comprehensive clinical evaluation (within 60 days) is required before a sleep study can be considered. (Note: The rendering site must be a qualified provider of service per health plan policy). The clinical evaluation may include a relevant history and physical examination, appropriate laboratory studies, and other relevant diagnostic studies (such as a previous sleep study or overnight pulse oximetry). The results of a sleep questionnaire or sleep questionnaire proxy are required. See: **SL-1.2: Sleep Questionnaires**.
 - ◆ Other meaningful contact (telephone call, video conference [telemedicine], electronic mail, or messaging) by an established patient can substitute for a face-to-face clinical evaluation
 - ◆ Documented history may include the following:
 - Persistent symptoms present for greater than 4 weeks in duration and not associated with respiratory infections.
 - House partners/spouses can describe symptoms, including apneic spells, such as gasping and choking.
 - Co-workers, friends, and/or the patient may report that the patient falls asleep during business meetings, conversations, while stopped at traffic lights, or while driving.
 - Daytime tiredness and excessive caffeine or stimulant use.
 - Excessively loud, erratic and variable snoring. (Note: Snoring alone is not always indicative of OSA).
 - Frequent awakening during the night.
 - Increased movements; sleep talking; displaying confused or erratic behavior during sleep.
 - Morning headaches, limited attention, or memory loss.
 - Drowsy driving or history of car crashes or near miss accidents related to sleepiness.
 - Prior diagnosis of OSA and response to therapy.
 - ◆ Documented physical examination should include:
 - Cardiopulmonary evaluation
 - Level of obesity and/or neck circumference

- Other findings, such as: macroglossia, tonsillar hypertrophy, nasal polyps, septal deviation, turbinate hypertrophy, elongated/enlarged uvula, narrow/high arched hard palate retrognathia (recessed mandible) or micrognathia (small mandible).

SL-1.2: Sleep Questionnaires

- Four sleep questionnaires (all self-answered by the patient) are commonly used to quantify the level of sleepiness, quality of sleep or probability of having OSA. These validated questionnaires include (but are not be limited to):
 - ◆ Epworth Sleepiness Scale
 - ◆ Berlin Questionnaire
 - ◆ STOP Bang Questionnaire
 - ◆ Insomnia Severity Index
- eviCore uses the results of these questionnaires to help formulate a patient's likelihood of having sleep-related disease, so the questionnaires must be appropriate for the specific sleep issue in question (e.g. STOP-BANG and Berlin are most appropriate for OSA evaluation).
 - ◆ To view these questionnaires and their interpretation in their entirety, see **SL-8: Questionnaires**.
- Results of one of these four questionnaires are required, **or** the following condition can serve as a proxy for the sleep questionnaire requirement:
 - ◆ Witnessed apnea by a bed partner
 - ◆ Previous diagnosis of OSA, confirmed in record

SL-1.3: Classifications of Sleep Apnea

- Sleep apnea is defined as repetitive partial or complete cessations of breathing that occur during sleep. These breathing events can be caused by a physical obstruction of the upper airway, a lack of effort to breathe, or a combination of these two factors. The source of the sleep disordered breathing determines the type or classification of sleep apnea.
 - ◆ Obstructive sleep apnea (OSA):
 - OSA is caused by a physical obstruction in the upper airway.
 - Sleep study recording characterized by:
 - Loud snoring
 - Obstructive apnea events – scored as apneas with apnea index or AI
 - Hypopnea events – scored with hypopnea index or HI
 - Significant oxyhemoglobin desaturations
 - Arousals from sleep
 - ◆ Central sleep apnea (CSA):
 - CSA is caused by a reduction or absence of effort to breathe by the diaphragm or respiratory muscles.
 - Sleep study recording characterized by:
 - Central apnea events, or hypopnea events
 - Occasional snoring
 - Oxyhemoglobin desaturation
 - Occasional arousals from sleep

- ◆ Mixed sleep apnea:
 - Mixed sleep apnea is a combination of both OSA and CSA
 - Mixed apnea events generally start with a central apnea component and terminate with efforts to breathe indicative of an obstructive apnea event
- ◆ Cheyne-Stokes Respiration:
 - CSR is a form of periodic breathing characterized by the waxing and waning of respiratory effort and airflow
 - CSR generally starts with a gradual waning of breathing effort and airflow which results in a central apnea, or hypopnea, followed by a gradual increase in breathing effort and flow

SL-1.4: Coding

SL-1.4.1: Home Portable Monitoring (PM) (Home Sleep Testing) - Coding

There are currently 3 levels (G0398, G0399 and G0400) of home PM's, with varying number of monitored parameters. Each can be used with or without an attendant but are generally performed unattended in the patient's home.

Home Sleep Studies	HCPCS	Channels
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	G0398	At least 7 monitored channels. Can calculate AHI.
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	G0399	At least 4 monitored channels (airflow/ventilation, heart rate, oxygen saturation, respiratory movement)
Home sleep test (HST) with type IV portable monitor, unattended; minimum of 3 channels	G0400	Measures 1 to 3 parameters

PSG PROCEDURE CODES	
Unattended Sleep Studies	CPT®
➤ Sleep study, unattended, measures a minimum of heart rate, oxygen saturation, and respiratory analysis (e.g., by airflow or peripheral arterial tone), and sleep time.	95800
◆ Simultaneous recording; simultaneous recording; heart rate, oxygen saturation, and respiratory analysis (e.g., by airflow or peripheral arterial tone), and sleep time. ◆ For unattended sleep study that measures a minimum of heart rate, oxygen saturation, and respiratory analysis, report 95801 ◆ Do not report CPT® 95800 in conjunction with any of the following CPT® codes: 93041-93227, 93228, 93229, 93268-93272, 95801, 95803, 95806.	
➤ Sleep study, unattended, measures a minimum of heart rate, oxygen saturation, and respiratory analysis (e.g., by airflow or peripheral arterial tone)	95801
◆ Simultaneous recording; minimum of heart rate, oxygen saturation, and respiratory analysis (e.g., by airflow or peripheral arterial tone). ◆ For unattended sleep study that measures a minimum of heart rate, oxygen saturation, and sleep time, report 95800 ◆ Do not report CPT® 95801 in conjunction with any of the following CPT® codes: 93041-93227, 93228, 93229, 93268-93272, 95800, 95806.	
➤ Sleep study, unattended, simultaneous recording of heart rate, oxygen saturation, respiratory airflow and respiratory effort (e.g. thoracoabdominal movement)	95806
◆ Simultaneous recording; minimum of ventilation, respiratory effort, ECG or heart rate, and oxygen saturation. ◆ For unattended sleep study that measures heart rate, oxygen saturation, respiratory analysis, and sleep time, report 0203T ◆ For unattended sleep study that measures heart rate, oxygen saturation, respiratory analysis, report 0204T. ◆ Do not report CPT® 95806 in conjunction with any of the following codes: CPT® 93012, 93014, 93041-93227, 93228, 93229, 93230-93272, 0203T, 0204T	

SL-1.4.2: Polysomnography (Facility-based-PSG) - Coding

PSG PROCEDURE CODES	
Attended Polysomnography and Sleep Studies	CPT®
➤ Multiple sleep latency or maintenance of wakefulness testing, recording, analysis and interpretation of physiological measurements of sleep during multiple trials to assess sleepiness or ability to remain awake.	95805
◆ Prior to treatment when the requesting physician suspects narcolepsy. ◆ Must be requested with a facility sleep study performed the night before the 95805 (CPT® 95810 or CPT® 95811).	
➤ Polysomnography; (any age), sleep staging with 1-3 additional parameters of sleep, attended by a technologist	95808
◆ Requests will be forwarded for Medical Director review	
➤ Sleep study, simultaneous recording of ventilation, respiratory effort, ECG or heart rate, and oxygen saturation, attended by a technologist with PAP titration, i.e., PAP-NAP	95807
◆ Considered experimental and investigational by some healthcare plans. <i>Requests will be forwarded for Medical Director review.</i>	
Attended Polysomnography and Sleep Studies	CPT®
➤ Polysomnography; (age 6 years or older), sleep staging with 4 or more additional parameters of sleep, attended by a technologist.	95810
◆ CPT® 95810 is used to report full-night studies. ◆ One of the more common studies.	
➤ 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 Bi-level ventilation, attended by a technologist	95811
◆ One of the more common studies. ◆ CPT® 95811 is used either as either a split-night study with both the diagnostic study and the subsequent positive airway pressure or bi-level ventilation are initiated during the same visit, or as PAP titration alone after CPT® 95810 or inability to complete split night sequence or as a retitration of PAP therapy.	
Attended Polysomnography and Sleep Studies (PEDIATRIC CODES)	CPT®
Polysomnography, (younger than 6 years), sleep staging with 4 or more additional parameters of sleep, attended by a technologist.	95782
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.	95783

SL-2: Indications/Diagnostic Testing

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SL-2.1: Home Sleep Testing (HST) Indications

- HST can be performed when **all of the following** three criteria are met:
 - ◆ High pre-test probability of moderate-to-severe OSA as defined by validated questionnaire **or** reported symptoms of excessive daytime sleepiness and **at least two** of the following three criteria (habitual loud snoring, or witnessed apnea or gasping or choking, or diagnosed hypertension)
 - ◆ HST can physically be performed **and** patient has the mobility, dexterity and cognitive ability to use the available equipment safely at home and the ability to follow instructions; **and**
 - ◆ Does not exhibit one of the co-morbid indications for attended sleep studies found in **SL-2.2: In-Laboratory Polysomnography- OSA Indications**.
- HST can also be used in follow-up treatment results after:
 - ◆ Surgical treatment for moderate to severe OSA, or
 - ◆ OSA Oral appliance trial, or
 - ◆ Other non-PAP supportive interventions (e.g. positional therapy).
- A follow-up visit to review test results should be performed for all patients undergoing HST

SL-2.2: In-Laboratory Polysomnography- OSA Indications

- PSG CPT® 95811 (See also **SL-2.4: Split Night Study or Two Night Study**) can be considered for the following: Sleep survey or proxy symptom(s) lead to **any** pretest probability of OSA and **one** of the following:
 - ◆ HST cannot be done due to one of the following reasons:
 - OSA symptoms with low pretest probability of OSA.
 - Patient does not have the mobility, dexterity or cognitive ability to use the available equipment safely at home and the ability to follow instructions.
 - HST has been attempted and is negative, inconclusive, or technically inadequate (report submitted for review).³⁸
 - ◆ Documentation of at least one of the following suspected or known co-morbid diagnoses:
 - Morbid obesity (BMI > 45, Obesity Hypoventilation Syndrome defined as BMI > 30 plus arterial blood gas with PCO₂ > 45).
 - Moderate to severe pulmonary disease (for example: COPD, asthma) with nocturnal oxygen use or documented arterial blood gases showing PO₂ < 60 or PCO₂ > 45
 - Documented neuromuscular disease (for example: Parkinson's, documented stroke or undocumented stroke with residua, active epilepsy, myotonic dystrophy, ALS)
 - Moderate to severe congestive heart failure with documented pulmonary congestion or known left ventricular ejection fraction < 45%, or
 - Other critical illness that would prevent them from using the HST equipment.
 - Chronic severe insomnia (by objective measure e.g. sleep diary, validated insomnia questionnaire).³⁸

- Chronic daily opioid use³⁸ (typically daily high-potency opioids e.g. Methadone®, Suboxone®, Dilaudid®) with stated concern for presence of central sleep apnea.
- Less than 18 years of age.
- Bi-level PAP or Adaptive Servo Ventilation PAP are specifically requested (CPT® 95811 only).
- Documented unsuccessful AutoPAP attempt:
 - Initiation of therapy started > 30 days ago and either:
 - ♦ AutoPAP machine download with AHI > 5/hr with symptoms (of OSA) or > 15/hr with or without return of symptoms
 - ♦ AutoPAP use > 70% of nights, 4+hrs/night with continued symptoms noted
- Central sleep apnea
- “Complex sleep apnea”
- ♦ Diagnostic Testing pre- and post- hypoglossal nerve stimulator implantation³⁷⁻⁴⁰
 - A hypoglossal nerve stimulator is a surgically implanted device that delivers stimulating electrical pulses to the hypoglossal nerve, which controls upper airway musculature. With a sensing lead, the device permits synchronization with ventilatory effort. The Stimulation Treatment for Apnea Reduction (STAR) trial was a prospective, multicenter trial of 126 participants with a body mass index less than 32, moderate to severe obstructive sleep apnea (AHI 20-50), and difficulty tolerating/adhering to CPAP. Participants, who served as their own control, experienced a significant reduction in Apnea Hypopnea Index with hypoglossal nerve stimulation (68% decrease) and oxygen desaturation index (70% decrease) at 12 months, as well as a reduction in self-reported outcomes at 12 and 24 months.ⁱⁱⁱ These improvements were maintained at 3 years.ⁱ During the trial, a response to hypoglossal nerve stimulation was defined as a reduction of AHI by at least 50% from baseline and an AHI of less than 20 events per hour at one year¹.
 - Pre-implantation:
 - **No prior sleep testing:** Patients with a high pre-test likelihood for moderate to severe obstructive sleep apnea who have not undergone prior sleep testing should undergo home sleep apnea testing, if appropriate per guidelines, and a PAP trial before consideration of facility testing for possible hypoglossal nerve stimulator implantation. Please see sections **SL-2.1: Home Sleep Testing (HST) Indication**, prior sections in **SL-2.2: In-Laboratory Polysomnography- OSA Indications**, and, **SL-2.2.1: In-Laboratory Polysomnography- Other Indications** for guidelines for patients who have not undergone prior testing.
 - **Prior diagnosis of OSA based on polysomnography:** Patients who have recently undergone polysomnography, (within 12 months), do not need a repeat study unless there have been changes in weight or symptoms to suggest a clinically significant change in sleep study results. In the setting of recent significant changes in weight or symptoms, repeat polysomnography could be considered if the following criteria are met (BOTH):

- BMI $\leq$ 32
- Previous intolerance to CPAP and/or bi-level PAP during a minimum of one month trial
- **Prior diagnosis of OSA based on home sleep apnea testing:** In the setting of a known diagnosis of obstructive sleep apnea based on home sleep apnea testing, the following criteria must be met prior to performance of polysomnography (CPT® 98510) for pre-implantation evaluation (ALL):
 - BMI $\leq$ 32
 - AHI or REI less than 65 on home sleep testing
 - Intolerance to CPAP and/or bi-level PAP during a minimum of one month trial
- Post-implantation:
 - As per the clinical trial, polysomnography can be performed at approximately one month post-implantation for the purpose of titrating device parameters and determining therapeutic stimulation settings
 - Following the titration study at one month, retesting (either HST or PSG CPT® 95810) can be performed if any of the following occurs:
 - ◆ Clinical response is insufficient despite regular treatment with hypoglossal nerve stimulator.
 - ◆ Substantial weight gain with return of symptoms.
 - ◆ Results of previously medically necessary sleep test were inadequate due to limited sleep time or other variables.
 - Note: Following the titration study at one month, the choice of home sleep apnea testing or facility polysomnography for repeat testing will be based on indications and co-morbidities outlined in **SL-2.1: Home Sleep Testing (HST) Indication**, prior sections in **SL-2.2: In-Laboratory Polysomnography- OSA Indications**, and **SL-2.2.1: In-Laboratory Polysomnography- Other Indications**.

SL-2.2.1: In-Laboratory Polysomnography- Other Indications

- Suspected narcolepsy or idiopathic hypersomnia (with CPT® 95805), as evidenced by.^{18,19}
 - ◆ Excessive sleepiness (shown not due to other more common sleep disorders), AND
 - ◆ Recurrent daytime naps or lapses into sleep daily for at least 3 months.
 - ◆ Additional symptoms may include:
 - Cataplexy- sudden loss of muscle tone occurring in association with intense emotion (laughing or crying), OR
 - Sleep paralysis, hypnagogic hallucinations, hypnopompic hallucinations, automatic behaviors, or disrupted major sleep episode
 - ◆ See **SL-2.3: In-Laboratory Multiple Sleep Latency Testing (excessive sleepiness) Indications and Criteria**
- Previous sleep study results (and history) consistent with possible idiopathic hypersomnia.

- Persistent symptomatic congestive heart failure (CHF), despite adequate medical treatment, and regardless of pre-test probability of OSA.
- More complicated parasomnias, **NOT including** more common conditions such as:
 - ◆ Typical disorders of arousal.
 - ◆ Nightmares.
 - ◆ Enuresis.
 - ◆ Somniloquy.
 - ◆ Bruxism.
- Rapid Eye Movement (REM) Behavior Disorder: Characterized by the acting out of dreams that are vivid, intense, and violent. Purposeful dream-enacting behaviors include talking, yelling, punching, kicking, sitting, jumping from bed, arm flailing, and grabbing. Also called “acting out of dreams.”
- Periodic limb movement disorder (PLMD), but NOT Restless Leg Syndrome (RLS). Suspected PLMD is defined by periodic episodes of repetitive limb movements during sleep not caused by another sleep disorder (such as OSA), while RLS is a subjective uncomfortable sensation experienced while awake.

Practice note

Occupational requirements (e.g., Department of Transportation [DOT], Federal Aviation Administration [FAA]) to date do not specify home vs. facility testing for initial evaluation. Indications for sleep studies should also be based on these guideline criteria.

Preoperative bariatric surgery testing should also be based on these guidelines criteria.

SL-2.3: In-Laboratory Multiple Sleep Latency Testing (excessive sleepiness) Indications and Criteria

Multiple Sleep Latency Testing (MSLT, CPT® 95805) can be considered for the following:

- Suspected narcolepsy or idiopathic hypersomnia, see **SL-2.2.1: In-Laboratory Polysomnography- Other Indications**
 - ◆ Immediately follows PSG (CPT® 95810) (cannot follow split-night study)¹⁸, AND
 - ◆ Comprehensive Sleep Evaluation including ESS or Berlin performed, AND
 - ◆ If OSA is suspected, diagnostic study has been performed, and if OSA is present, therapy is initiated, and has resolved symptoms of increased airway resistance (e.g. eliminated snoring).
- Is not requested to assess efficacy of PAP therapy for OSA.

SL-2.4: Split Night Study or Two Night Study

Split Night Study

- Split night study (CPT® 95811) is a single-night PSG + PAP trial, and typically can be completed if both:
 - ◆ Apnea Hypopnea Index (AHI) is greater than 15/hr for ≥ 2 hours of testing
 - ◆ ≥ 3 hours of sleep time remain for PAP titration

- Split night study (CPT® 95811) can be achieved in the majority of cases in one night. This is the current recommended approach per Centers for Medicare and Medicaid Services (CMS) and American Academy of Sleep Medicine (AASM)³⁸.

Two Night Study

- In some cases a split night study cannot be completed because the above criteria is not met and sleep testing must be done in two nights.
 - ◆ The first night's study is performed as (CPT® 95810)
 - ◆ Followed by second night PAP (CPT® 95811)
- When PAP titration (CPT® 95811) is subsequently requested after a completed PSG, CPT® 95810 (full-night diagnostic of failed split-study) or HST, the following information should be used to consider unattended APAP or attended CPAP titration:
 - ◆ The same indications that were used to consider PSG or HST see **SL-2.2: In-Laboratory Polysomnography- OSA Indications**
 - ◆ All new information from the PSG or HST.
- For more information on the technical and policy requirements of PSG, as well as on PSG scoring, see Practice Notes **SL-7: Practice Notes**

SL-2.5: Repeat Sleep Testing - (Home or Attended Sleep Studies)

SL-2.5.1: Re-assessment of tx results with known OSA

- Re-assessment of treatment results (PAP) for a patient with known OSA can be performed when any of the following has occurred (either: HST, PSG-CPT® 95811, PAP, or APAP) based on indications and co-morbidities found in **SL-2.2: In-Laboratory Polysomnography- OSA Indications**:
 - ◆ Substantial weight gain (10% of body weight) with return of symptoms. BMI falls below 30 and there is either intolerance of PAP pressure or a desire to discontinue PAP therapy.
 - ◆ Clinical response is insufficient despite treatment.
 - ◆ Symptoms return despite a good initial response to CPAP.
 - ◆ PAP machine download with AHI > 5/hr with return of symptoms or > 15/hr with or without return of symptoms.
 - ◆ **NOT** to assess for the continued presence of OSA, or for the efficacy of PAP therapy in the absence of recurrent or changed symptoms.
 - ◆ **NOT** to supply new PAP equipment.
 - ◆ Must demonstrate that recurrent or continued symptoms are not due to insufficient compliance (must be using PAP > 70% of nights, 4+hrs/night with continued symptoms).
 - ◆ Results of previous medically necessary sleep test were inadequate and not diagnostic due to limited sleep time or other specified variables.

SL-2.5.2: Re-assessment of suspected narcolepsy or idiopathic hypersomnia

- Reassessment of suspected narcolepsy or idiopathic hypersomnia with a repeat CPT® 95810/CPT® 95805 can be considered if previous testing did not confirm the diagnosis but clinical suspicion is still present despite treatment, or due to a change in symptoms (e.g. development of sleep paralysis, cataplexy, hypnagogic hallucinations or worsening hypersomnolence).
 - ◆ If the patient also has OSA, CPT® 95811 is supported instead of CPT® 95810 as the patient must be on PAP therapy prior to MSLT.

Note

Result of previous studies should be submitted for review prior to authorization of additional studies.

SL-3: Pediatric Sleep Guidelines

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SL-3.1: Proper Uses of Polysomnography in Pediatric Patients

Use of home/portable sleep studies for the diagnosis of OSA in children (17 years and younger) is considered investigational at this time. Limited portable studies, or studies in the home, are not sufficient to exclude OSA in a child with suggestive symptoms, nor can they reliably assess the severity of the disorder which is important in planning treatment. Overnight polysomnography remains the diagnostic "gold-standard" in children with OSA.

- Overnight polysomnography (PSG) in a sleep lab setting is appropriate for children (17 years of age and younger) for the diagnosis of **any** of the following conditions:
 - ◆ Sleep related breathing disorders, such as obstructive sleep apnea, upper airway resistance syndrome; **or**
 - ◆ Narcolepsy or idiopathic hypersomnia (generally would be performed in conjunction with a multiple sleep latency test); **or**
 - ◆ Congenital central alveolar hypoventilation syndrome or sleep related hypoventilation due to neuromuscular disorders or chest wall deformities;
 - ◆ Nocturnal seizure activity.
 - ◆ REM behavior disorder (rare in childhood).
 - ◆ Repeat PSG following adenotonsillectomy if there are residual symptoms of OSA or to assess for residual OSA.
 - ◆ Polysomnography of primary sleep apnea of infancy. (When other medical disorders have been ruled out)
 - ◆ Suspected periodic limb movement disorder
- Overnight PSG in a sleep lab is appropriate for children with **any** of the suspected following:
 - ◆ Habitual (nightly) snoring associated with **any** of the following:
 - Restless or disturbed sleep; or
 - Behavioral disturbance, or learning disorders including deterioration in academic performance, hyperactivity, or attention deficit disorder; or
 - Unexplained enuresis; or
 - Frequent awakenings; or
 - Failure to thrive or growth impairment; or
 - Witnessed apnea; or
 - Excessive daytime somnolence, or altered mental status unexplained by other conditions or etiologies; or
 - Polycythemia unexplained by other conditions or etiologies; or
 - Cor pulmonale unexplained by other conditions or etiologies; or
 - Hypertrophy of tonsils and adenoids associated with noisy daytime respirations where surgical removal poses a significant risk and would be avoided in the absence of sleep disordered breathing.
- Polysomnography when there is clinical evidence of a sleep related breathing disorder in infants who have experienced an apparent life-threatening event (ALTE).
- Repeat overnight polysomnography in a sleep lab setting for children is considered medically necessary in **any** of the following circumstances:

- ◆ Initial polysomnography is inadequate or non-diagnostic and the accompanying caregiver reports that the child's sleep and breathing patterns during the testing were not representative of the child's sleep at home;
 - ◆ For positive airway pressure (PAP) titration in children with obstructive sleep apnea syndrome.
 - ◆ A child with previously diagnosed and treated obstructive sleep apnea who continues to exhibit persistent snoring or other symptoms of sleep disordered breathing.
 - ◆ To periodically re-evaluate the appropriateness of continuous positive airway pressure (CPAP) setting based on the child's growth pattern or the presence of recurrent symptoms while on CPAP.
 - ◆ If obesity was a major contributing factor and significant weight loss has been achieved, repeat testing may be indicated to determine the need for continued therapy.
- Polysomnographic normal standards differ between children and adults.
- ◆ Diagnosis of pediatric obstructive sleep apnea is demonstrated by both of the following:
 - The presence of one or more of the following:
 - Snoring
 - Labored, paradoxical or obstructed breathing during the child's sleep
 - Sleepiness, hyperactivity, behavioral problems, or learning problems
 - PSG demonstrates one or more of the following:
 - one or more obstructive apneas, mixed apneas, or hypopneas per hour of sleep **or**
 - A pattern of obstructive hypoventilation defined as at least 25% of total sleep time with hypercapnia ($\text{PaCO}_2 > 50$ mm Hg) in association with one or more of the following: snoring, flattening of the inspiratory nasal pressure waveform, paradoxical thoracoabdominal motion.

SL-3.2: CPAP in Pediatric Patients

- CPAP is indicated when **all** of the following criteria are met:
- ◆ OSA diagnosis has been established by PSG; and
 - ◆ Adenotonsillectomy has been unsuccessful or is determined to be clinically inappropriate, or when definitive surgery is indicated but must await complete dental and facial development

SL-3.3: Improper Uses of Polysomnography in Pediatric Patients

- The peer-reviewed medical literature **does not** support the following:
- ◆ Repeat polysomnography in the follow-up of patients with obstructive sleep apnea treated with CPAP when symptoms attributable to sleep apnea have resolved
 - ◆ Polysomnography in children for **any** of the following:
 - Sleep walking or night terrors
 - Routine evaluation of adenotonsillar hypertrophy alone without other clinical signs or symptoms suggestive of obstructive sleep disordered breathing
 - Routine follow-up for children whose symptoms have resolved post-adenotonsillectomy

SL-4: Treatment of Obstructive Sleep Apnea (OSA)

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SL-4.1: General Requirements

- Positive diagnosis of OSA, as measured by valid testing defined as:
 - ◆ The apnea-hypopnea index (AHI), respiratory disturbance index (RDI), respiratory event index (REI) is ≥ 15 events per hour; or
 - ◆ The AHI, RDI, or REI is ≥ 5 and ≤ 14 events per hour and documentation of:
 - Symptoms of sleepiness, nonrestorative sleep, fatigue, or insomnia
 - Report of awakening with breath holding, gasping, or choking
 - Bed partner or other observer reports habitual snoring, breathing interruptions, or both during sleep
 - Hypertension, a mood disorder, cognitive dysfunction, coronary artery disease, congestive heart failure, atrial fibrillation, type 2 diabetes mellitus, or stroke.
- Results from the sleep study are used to determine the type of sleep apnea, the severity of the breathing disorder, and the most appropriate form of treatment. Depending on these factors, a variety of PAP devices, and location of titration of therapy, can be considered.
- Positive airway pressure is the treatment of choice for the various forms of sleep apnea. Positive airway pressure (PAP) is produced by a flow generator and applied to the airway through nasal, oral, or oronasal mask interfaces

SL-4.1.1: Treatment of Obstructive Sleep Apnea - Coding

Treatment Codes (HCPCS and CPT®)	CODE
Continuous airway pressure (CPAP/APAP) device	E0601
Respiratory assist device, bi-level pressure (BiPAP) capability, WITHOUT backup rate feature, used with noninvasive interface, e.g. nasal or facial mask (intermittent assist device with continuous positive airway pressure device)	E0470
Respiratory assist device, bi-level pressure (BiPAP) capability (including ASV), WITH backup rate feature, used with noninvasive interface, e.g. nasal or facial mask (intermittent assist device with continuous positive airway pressure device)	E0471
Respiratory assist device, bi-level pressure (BiPAP) capability, WITH backup rate feature, used with invasive interface, e.g. tracheostomy tube (intermittent assist device with continuous positive airway pressure device)	E0472
Humidifier, non-heated, used with positive airway pressure (CPAP/BiPAP/APAP) device	E0561
Humidifier, heated, used with positive airway pressure (CPAP/BiPAP/APAP) device	E0562
Tubing with heating element	A4604
Combination oral/nasal mask	A7027
Replacement oral cushion combo mask	A7028
Replacement nasal pillow comb mask	A7029
CPAP full face mask	A7030
Replacement facemask interface	A7031
Replacement nasal cushion	A7032
Replacement nasal pillows	A7033
Nasal interface (mask or cannula type) used with PAP device	A7034

Positive airway pressure headgear	A7035
Positive airway pressure chinstrap	A7036
Positive airway pressure tubing	A7037
Positive airway pressure filter	A7038
Filter, non-disposable w/ PAP	A7039
PAP oral interface	A7044
Replace exhalation port	A7045
Replacement, water chamber, PAP device	A7046
Monitoring feature/device, stand-alone or integrated, any type, includes all accessories, components and electronics, not otherwise classified (this code relates to Compliance and the data download of a patient's PAP therapy).	A9279
CPAP initiation and management (code is used to report the initiation and instruction when a patient begins therapy)	CPT® 94660

SL-4.1.2: Current Practice Recommendations for CSA with CHF

- CPAP: Standard
- BiPAP (including ST): Option if CPAP ineffective
- ASV:
 - ◆ OPTION if EF > 45% **or** mild central sleep apnea syndrome
 - ◆ **STANDARD AGAINST** if EF ≤ 45% with moderate/severe central sleep apnea syndrome³⁵

SL-4.1.3: Treatment of Opioid-Induced Sleep Disordered Breathing

- CSAS associated with drug or substance use: There is currently no evidence to support routine use of facility-based diagnostic sleep testing due to concurrent opioid or other substance use in the absence of clinical history or previous diagnostic testing suggesting or confirming the presence of sleep disordered breathing. Recent studies suggest “medium increased risk” for central apnea in long-term opioid users, but further investigation is recommended. If diagnostic testing is indicated, home sleep testing is not supported for evaluation of chronic opioid users³⁸ (see **SL-2.2.1: In-Laboratory Polysomnography- Other Indications**). With respect to treatment, current literature is “markedly limited” and further studies are clearly needed to conclusively determine if CPAP is less effective than BiPAP or ASV, although recent studies suggest ASV may be effective in treatment-resistant patients.^{36, 37}

SL-4.2: Positive Airway Pressure Devices

SL-4.2.1: Auto-titration of positive airway pressure in unattended setting

- Initial E0601 APAP Titration can be considered for the following (ALL):
 - ◆ A face-to-face clinical evaluation by the treating physician following the diagnostic study and prior to the titration and
 - ◆ Positive diagnosis of OSA, as defined in **SL-1.1: General Requirements**
 - ◆ Rendering site is a qualified provider of service per health plan policy
- Repeat E0601 APAP Titration (includes re-titration following initial CPT® 95811 when uncomplicated) can be considered for the following (ALL):
 - ◆ A positive diagnosis of OSA, as measured by HST or PSG as defined in **SL-1.1: General Requirements**
 - ◆ Attempted compliance with preexisting or existing therapy (70% of nights, 4+ hours/night) has not adequately treated signs and symptoms.
 - ◆ Persistent symptoms or unimproved AHI/RDI in individual currently on APAP/CPAP therapy, when the patient and/or their caregiver has received the following from the treating physician or supplier of the PAP device:
 - Instruction in the proper use and care of the equipment, and
 - Mask re-fitting or adjustment if necessary, and
 - Education for proper use of PAP accessories, AND
 - ◆ Rendering site is a qualified provider of service per health plan policy

SL-4.2.2: Continuous Positive Airway Pressure therapy

- Initiation of E0601 PAP Therapy and establishing compliance (All of the following):
 - ◆ A positive diagnosis of OSA, as measured by HST or PSG as defined in **SL-1.1: General Requirements**
 - ◆ The patient and/or their caregiver have received instruction from the treating physician and supplier of the CPAP device and accessories in the proper use and care of the equipment²², AND
 - ◆ A compliance support plan between the treating physician and DME supplier has been established, AND
 - ◆ Rendering site is a qualified provider of service per health plan policy
- Authorization for equipment purchase (**All** of the following):
 - ◆ Resolution of symptoms and improved AHI during initiation period, AND
 - ◆ Device must be consistently used (70% of nights) for an average of four hours or more per 24 hour period, during a consecutive 30 day period during the first 3 months of usage, AND
 - ◆ Re-evaluation of symptoms during days 31-90²¹
 - ◆ Rendering site is a qualified provider of service per health plan policy
- Extension of establishing compliance with E0601 (All of the following):
 - ◆ Failure to resolve symptoms or unimproved AHI during initial compliance period²², AND
 - ◆ Inconsistent usage of device related to improper fit, lack of education, intolerance of PAP therapy, or device malfunction, AND

- ◆ Patient has received from the ordering physician or supplier of the PAP device in the past 30 days:
 - Instruction in the proper use and care of the equipment, AND
 - Mask refitting or adjustment if necessary, AND
 - Education for proper use of PAP accessories, AND
- ◆ Rendering site is a qualified provider of service per health plan policy
- Replacement APAP/CPAP E0601 device (All of the following):
 - ◆ Continued resolution of symptoms and improved AHI on therapy, AND
 - ◆ Device consistently used for an average of four hours or more per 24 hr period, 70% of nights, AND
 - ◆ Device is not operating AND
 - ◆ DME supplier has physically evaluated the device and determined that it is unable to be repaired, AND
 - ◆ Device to be replaced is no longer covered under a warranty, AND
 - ◆ Rendering site is a qualified provider of service per health plan policy

SL-4.2.3: Bi-level Positive Airway Pressure – spontaneous mode

- Initiation of E0470 PAP Therapy and establishing compliance (ALL):
 - ◆ One of the following medical conditions must be documented in the patient's record:
 - Neuromuscular disease or restrictive thoracic disorder:
 - Neuromuscular disease (e.g. amyotrophic lateral sclerosis) or a severe thoracic cage abnormality (e.g. severe kyphoscoliosis, post-thoracoplasty), AND
 - One of the following:
 - An arterial blood gas PaCO₂, done while awake and breathing the patient's prescribed FiO₂, is ≥ 45 mm Hg, or
 - Sleep oximetry demonstrates oxygen saturation $\leq 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours), done while breathing the patient's prescribed FiO₂, or
 - Neuromuscular disease only:
 - ◆ Maximal inspiratory pressure is < 60 cm H₂O, or
 - ◆ Forced vital capacity is $< 50\%$ predicted, or
 - ◆ Symptomatic respiratory disease impairing activities of daily living, OR
 - Severe COPD:
 - An arterial blood gas PaCO₂ is ≥ 52 mm Hg done while awake and breathing the patient's prescribed FiO₂, or
 - Sleep oximetry demonstrates oxygen saturation $\leq 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours), done while breathing 2 LPM or the patient's prescribed FiO₂ (whichever is higher), and
 - OSA and treatment with CPAP has been considered and ruled out, OR
 - Central sleep apnea or complex sleep apnea diagnosis when:
 - Objective information documents the following¹⁹
 - Diagnosis of central sleep apnea or complex sleep apnea, and

- Central hypopnea/apneas are $\geq 50\%$ of total, or
- Central apnea index ≥ 5 per hour.
- Significant improvement of the sleep-associated hypoventilation with the use of an E0470 device on the settings that will be prescribed for initial use at home, while breathing the patient's prescribed FiO_2 , OR
- Obstructive sleep apnea when:
 - Diagnosis of OSA as defined in **SL-1.1: General requirements**, and
 - CPAP (E0601) has been tried and proven either ineffective or not tolerated, based on a therapeutic trial conducted in either a facility or a home setting²², OR
- Obesity-hypoventilation syndrome during sleep:
 - $\leq 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours), and
 - Occurs in the absence of obstructive events, and
 - Patient has BMI $> 30 \text{ kg/m}^2$ plus arterial blood gas with $\text{PCO}_2 > 45$
- Other sleep-related hypoventilation syndrome:
 - A facility-based PSG demonstrates an increase in PaCO_2 (or surrogate PCO_2) during sleep to a value $> 55 \text{ mm Hg}$ for > 10 minutes, OR
 - A facility-based PSG demonstrates a $> 10 \text{ mm Hg}$ increase in PaCO_2 (or surrogate PCO_2) during sleep to a value $> 50 \text{ mm Hg}$ for > 10 minutes
- ◆ Rendering site is a qualified provider of service per health plan policy
- Continued E0470 therapy after initial 3 months (All of the following):
 - ◆ Re-evaluation of symptoms during days 61 – 90, AND
 - ◆ Device must be consistently used (70% of nights) for an average of four hours or more per 24 hour period, during a consecutive 30 day period during the first 3 months of usage, AND
 - ◆ Resolution of symptoms; AND
 - ◆ Rendering site is a qualified provider of service per health plan policy.
- Replacement Bi-level PAP E0470 device (All of the following):
 - ◆ Continued resolution of symptoms and improved AHI/RDI on therapy; AND
 - ◆ Device consistently used for an average of four hours or more per 24 hour period, 70% of nights, AND
 - ◆ Device is not operating, AND
 - ◆ DME supplier has physically evaluated the device and determined that it is unable to be repaired, AND
 - ◆ Device to be replaced is no longer covered under a warranty; AND
 - ◆ Rendering site is a qualified provider of service per health plan policy.

SL-4.2.4: Bi-level Positive Airway Pressure – spontaneous/timed mode

- Initiation of E0471 PAP Therapy and establishing compliance (ALL):
 - ◆ One of the following medical conditions must be documented in the patient's record:
 - Neuromuscular disease or restrictive thoracic disorder:

- Neuromuscular disease (e.g. amyotrophic lateral sclerosis) or a severe thoracic cage abnormality (e.g. severe kyphoscoliosis, post-thoracoplasty TB), AND
- One of the following:
 - An arterial blood gas PaCO₂, done while awake and breathing the patient's prescribed FiO₂, is ≥ 45 mm Hg, or
 - Sleep oximetry demonstrates oxygen saturation $\leq 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours), done while breathing the patient's prescribed FiO₂, or
 - Neuromuscular disease only:
 - ◆ Maximal inspiratory pressure is < 60 cm H₂O, or
 - ◆ Forced vital capacity is $< 50\%$ predicted, OR
- Severe COPD:
 - PaCO₂ is ≥ 7 mm Hg during sleep compared to the initial blood gas taken while awake and breathing prescribed FiO₂, and
 - A facility-based PSG demonstrates oxygen saturation of $< 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours) that is not caused by obstructive upper airway events (AHI < 5)
 - ◆ (See above for coverage of E0470 for OSA), OR
 - An arterial blood gas PaCO₂ done while awake and breathing the patient's prescribed FiO₂ is ≥ 52 mm Hg, and
 - Sleep oximetry while breathing with the E0470 device, demonstrates oxygen saturation $\leq 88\%$ for ≥ 5 minutes of nocturnal recording time (minimum recording time of 2 hours), done while breathing oxygen at 2 LPM or the patient's prescribed FiO₂ (whichever is higher), OR
- Central sleep apnea or complex sleep apnea diagnosis when:
 - Objective information documents the following:¹⁹
 - Diagnosis of central sleep apnea or complex sleep apnea:
 - ◆ Central hypopnea/apneas are $\geq 50\%$ of total, and
 - ◆ Central apnea index ≥ 5 per hour.
 - Significant improvement of the sleep-associated hypoventilation with the use of an E0471 device on the settings that will be prescribed for initial use at home, while breathing the patient's prescribed FiO₂, OR
- Other hypoventilation syndrome when:
 - A covered E0470 device is being used, and
 - A facility-based PSG demonstrates an increase in PaCO₂ (or surrogate PCO₂) during sleep to a value > 55 mm Hg for > 10 minutes, OR
 - A facility-based PSG demonstrates a > 10 mm Hg increase in PaCO₂ (or surrogate PCO₂) during sleep to a value > 50 mm Hg for > 10 minutes
- ◆ Rendering site is a qualified provider of service per health plan policy
- Continued E0471 therapy after initial 3 months (All of the following):
 - ◆ Re-evaluation of symptoms during days 61 – 90, AND
 - ◆ Device must be consistently used (70% of nights) for an average of four hours or more per 24 hour period, during a consecutive 30 day period during the first 3 months of usage, AND
 - ◆ Resolution of symptoms, AND

- ◆ Rendering site is a qualified provider of service per health plan policy
- Replacement Bi-level PAP E0471 device (All of the following):
 - ◆ Continued resolution of symptoms and improved AHI/RDI on therapy; AND
 - ◆ Device consistently used for an average of four hours or more per 24 hr period, 70% of nights; AND
 - ◆ Device is not operating; AND
 - ◆ DME supplier has physically evaluated the device and determined that it is unable to be repaired; AND
 - ◆ Device to be replaced is no longer covered under a warranty; AND
 - ◆ Rendering site is a qualified provider of service per health plan policy.

SL-4.2.5: Heated (E0562) and non-heated (E0561) humidifier

- Initial set-up (All of the following):
 - ◆ When requested by treating physician and PAP device (E0470/471 or E0601) has been approved; AND
 - ◆ No previous humidifier has been provided; AND
 - ◆ Rendering site is a qualified provider of service per health plan policy.
- Replacement heated or non-heated humidifier (E0562 or E0561) device (All of the following):
 - ◆ Continued resolution of symptoms and improved AHI on PAP therapy; AND
 - ◆ Device consistently used for an average of four hours or more per 24 hr period, 70% of nights; AND
 - ◆ Humidifier device is not operating ;AND
 - ◆ DME supplier has physically evaluated the device and determined that it is unable to be repaired; AND
 - ◆ Device to be replaced is no longer covered under a warranty; AND
 - ◆ Rendering site is a qualified provider of service per health plan policy.

SL-4.2.6: Adaptive Servo Ventilation (ASV) therapy (E0471)

- Initiation of E0471 ASV Therapy and establishing compliance (ALL):
 - ◆ One of the following medical conditions must be documented in the patient's record:
 - Central sleep apnea (including Cheyne-Stokes breathing):
 - Diagnosis of central sleep apnea or complex sleep apnea, **and**
 - Central hypopnea/apneas are $\geq 50\%$ of total, and
 - Central apnea index ≥ 5 per hour, **and**
 - Mild CSA, or Moderate or Severe CSA with EF $> 45\%$.

OR

- Complex Sleep Apnea Syndrome
 - Documented persistent, treatment-emergent central or mixed apnea with application of CPAP
 - Central hypopnea/apneas are $\geq 50\%$ of total, and
 - Central apnea index ≥ 5 per hour, **and**
 - Failure of prior Bi-level trial (spontaneous or spontaneous/timed)

OR

- Central Sleep Apnea Syndrome due to opioid or substance use:
 - CPAP has been shown to be ineffective following a reasonable treatment attempt/trial, **AND**
 - Opioid therapy cannot be reduced or discontinued, **and**
 - Central hypopnea/apneas are $\geq 50\%$ of total, and
 - Central apnea index ≥ 5 per hour.
- and**
- ◆ Rendering site is a qualified provider of service per health plan policy
- Continued E0471 therapy after initial 3 months (All of the following):
 - ◆ Re-evaluation of symptoms during days 61 – 90, **and**
 - ◆ Device must be consistently used (70% of nights) for an average of four hours or more per 24 hr period, during a consecutive 30 day period during the first 3 months of usage, **and**
 - ◆ Resolution of symptoms; **and**
 - ◆ Rendering site is a qualified provider of service per health plan policy.
- Replacement ASV E0471 device (All of the following):
 - ◆ Continued resolution of symptoms and improved AHI/RDI on therapy; **and**
Device consistently used for an average of four hours or more per 24 hr period, 70% of nights, **and**
 - ◆ Device is not operating, **and**
 - ◆ DME supplier has physically evaluated the device and determined that it is unable to be repaired, **and**
 - ◆ Device to be replaced is no longer covered under a warranty, **and**
 - ◆ Rendering site is a qualified provider of service per health plan policy.

SL-4.2.7: Continuous positive airway pressure ventilation (CPAP), initiation, and management (94660)

- Physician face-to-face service addressing PAP usage:
 - ◆ Physician application or adjustment of mask or pressure titration or PAP related service; **and**
 - ◆ Service cannot be adequately provided by a certified or registered respiratory therapist, licensed clinician, or sleep technologist when within scope of practice per state regulations; **and**
 - ◆ Another evaluation and management service is not performed.

SL-4.3: Positive Airway Pressure Treatment Supplies**SL-4.3.1: PAP Masks and parts A7027, A7030, A7034, A7044, A7035, A7036**

- Combination oral/nasal mask, used with PAP, each (A7027):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 3 months.
 - ◆ No other PAP mask ordered (i.e., A7030, A7034, or A7044).
- Oral cushion used with combination oral/nasal mask, replacement only (A7028):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Only compatible with A7027 mask.
 - ◆ Frequency: 2 per month.
- Nasal pillows used with combination oral/nasal mask, replacement only, pair (A7029):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Only compatible with A7027 mask.
 - ◆ Frequency: 2 per month.
- Full face mask used with PAP, each (A7030):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 3 months.
 - ◆ No other PAP mask ordered (i.e., A7027, A7034, or A7044).
- Full face mask interface replacement, each (A7031):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Only compatible with A7030 mask.
 - ◆ Frequency: 2 per month.
- Nasal interface (mask or cannula type) used with PAP, each (A7034):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 3 months.
 - ◆ No other PAP mask ordered (i.e., A7027, A7030, or A7044).
- Cushion for use on nasal mask interface, replacement only, each (A7032):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Only compatible with A7034 mask.
 - ◆ Frequency: 2 per month.

- Nasal pillow for use on nasal cannula type interface, replacement only, pair (A7033):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Only compatible with A7034 mask.
 - ◆ Frequency: 2 per month.
- Oral interface used with PAP, each (A7044):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.
 - ◆ No other PAP mask ordered (i.e., A7027, A7030, or A7034).
- Headgear used with PAP, each (A7035):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.
- Chinstrap used with PAP, each (A7036):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.

SL-4.3.2: Positive airway pressure tubing (A4604, A7037)

- Tubing with integrated heating element for use with PAP devices, each (A4604):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 3 months.
 - ◆ No other PAP tubing ordered (i.e., A7037).
- Tubing used with PAP devices, each (A7037):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 3 months.
 - ◆ No other PAP tubing ordered (i.e., A4604).

SL-4.3.3: Positive airway pressure device filters (A7038, A7039)

- Filter, disposable, used with PAP devices (A7038):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 2 per 1 month.
- Filter, non-disposable, used with PAP devices (A7039):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.

SL-4.3.4: Miscellaneous positive airway pressure supplies (A7045, A7046)

- Exhalation port with or without swivel used with accessories for positive airway devices, replacement only (A7045):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.
- Water chamber for humidifier, used with positive airway pressure device, replacement, each (A7046):
 - ◆ Coverage criteria for PAP device is met.
 - ◆ Frequency: 1 per 6 months.

SL-5: Sleep Apnea Treatment Program Exclusions

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SL-5.1: Experimental and Investigational

- The effectiveness of the following therapies has not been established in the treatment of OSA; these therapies may be considered experimental and investigational:
 - ◆ Provent Sleep Apnea Therapy
 - ◆ Winx Therapy System/Oral Pressure Therapy

SL-5.2: Durable Medical Equipment Device and Supply Exclusions

- CPT® 94799 – Unlisted pulmonary service or procedure
 - ◆ Due to the presence of more specific codes, medical necessity for this code cannot be established
- E1399 – Miscellaneous durable medical equipment items, components, and accessories
 - ◆ Due to the presence of more specific codes for PAP equipment, medical necessity for this code cannot be established for PAP equipment

SL-6: Actigraphy (CPT® 95803)

- Actigraph devices, worn on the wrist, record movement and utilize rest activity patterns to estimate sleep parameters.
- Actigraphy requires long term recording for most indications, typically 7 to 14 days.
- Actigraphy can be considered for the following indications:
 - ◆ Suspected central hypersomnia (narcolepsy or idiopathic hypersomnia) for 1 to 2 weeks prior to MSLT as a means of objectively documenting sleep time.
 - ◆ Suspected insufficient sleep syndrome if there is doubt about the accuracy of history and sleep diaries.
 - ◆ Suspected long sleeper to document a regular pattern of 10 or more hours of sleep.
 - ◆ Suspected circadian rhythm disorders in adult and pediatric patients, including delayed sleep-wake phase disorder, advanced sleep-wake phase disorder, irregular sleep-wake rhythm disorder, shift work disorder to assess timing of habitual sleep period and total sleep time.
 - ◆ Chronic Insomnia in adult and pediatric patients as an estimate of sleep efficiency, wake after sleep onset and total sleep time, when there is doubt as to the accuracy of sleep diary data. ^{38,39,40, 41}

Note

Actigraphy should not be used in place of electromyography for the diagnosis of periodic limb movement disorder.

Actigraphy may be considered experimental and investigational by some healthcare plans.

SL-7: Practice Notes

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SL-7.1: Occupational Requirements

- The FAA does not give any specific guidance on when testing is required. They recommend Maintenance of Wakefulness Test (evaluates daytime alertness) if there remains any question, as well as, CPT® 95810 or CPT® 95811.
- The US DOT will not qualify a driver with “respiratory dysfunction (including sleep apnea) likely to interfere with ability to control or drive.” Sleep apnea requires a medical examination by (proposed administrative rule) “prefer[ably] Over-night” PSG but “accept[s] Home Sleep Testing as a controversial, new technology.” It is not clear whether sleep apnea will disqualify a driver that already has a license.
 - ◆ Federal Motor Carrier Safety Administration (FMCSA). Regulations: 49 CFR Parts 300-399. Available at: <http://www.fmcsa.dot.gov/regulations/title49/b/5/3>. Accessed October 16, 2017.

SL-7.2: Technical and Policy Requirements of PSG

- The parameters, settings, filters, technical specifications, sleep stage scoring and event scoring should be done in accordance with the AASM Manual for the Scoring of Sleep and Associated Events.
- HST should, at a minimum, record airflow, respiratory effort, and blood oxygenation. The type of biosensors used to monitor these parameters for in-laboratory PSG are recommended for use in HSTs and include the following:
 - ◆ Oronasal thermal sensor and nasal pressure transducer for airflow, apnea and hypopnea; **and**
 - ◆ Oximetry with a high sampling rate and fast averaging time for blood oxygenation; **and**
 - ◆ Ideally, a calibrated or uncalibrated respiratory inductance plethysmography for respiratory effort; **or**
 - ◆ Peripheral Arterial Tonometry (PAT) with oximetry and actigraphy
- Apnea-Hypopnea Index (AHI) by HST is the number of apneas + hypopneas / total recording time rather than total sleep time. As a result, HST's are likely to underestimate the severity of events compared to the Apnea- Hypopnea Index (AHI) by PSG. Due to the known rate of false negative HST, in-laboratory PSG should be performed in cases where HST is technically inadequate or fails to establish the diagnosis of OSA in patients with a high pretest probability.
- The eviCore guidelines recognize that HST can be appropriately performed by Joint Commission (JCAHO) and Medicare IDTF-approved facilities.
- PSG is called Type I monitoring:
 - ◆ Consists of minimum of 6 hours of constant monitoring in a controlled facility environment.
 - ◆ Involves 7 measurement parameters (3 channels of EEG, 2 channel electrooculography, 2 channels of anterior tibialis EMG, ECG or heart rate, oxygen saturation, airflow monitoring, and measures of sub-mental breathing/respiratory effort).
 - ◆ Facilities also typically record body position (with video) and snoring (via microphone).

- Results are reported and calculations of the Apnea-Hypoxia Index (AHI) or Respiratory Disturbance Index (RDI) are performed.
 - ◆ Scoring PSG:
 - OSA is confirmed if > 15 obstructive events per hour or > 5 obstructive events per hour plus clinical symptoms
 - Obstructive events include apneas, hypopneas, or respiratory-effort related arousals for calculation of RDI.
 - Obstructive events include apneas and hypopneas for calculation of AHI. RDI cannot accurately be calculated by HST.
 - Respiratory Event Index (REI) is appropriate for reporting sleep disordered breathing by HST.

SL-8: Questionnaires

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SL-8.1: Epworth Sleepiness Scale

The **Epworth Sleepiness Scale** is comprised of eight questions, with a maximum score of 24. A score >10 indicates moderate to high probability of excessive daytime sleepiness.

Epworth Sleepiness Scale	
Use the following scale to choose the most appropriate number for each situation: 0 = would never doze or sleep; 1 = slight chance of dozing or sleeping 2 = moderate chance of dozing or sleeping; 3 = high chance of dozing or sleeping	
Situation	Chance of Dozing or Sleeping
1. Sitting and reading	
2. Watching TV	
3. Sitting inactive in a public place	
4. Being a passenger in a motor vehicle for an hour or more	
5. Lying down in the afternoon	
6. Sitting and talking to someone	
7. Sitting quietly after lunch (no alcohol)	
8. Stopped for a few minutes in traffic while driving	
Total Epworth Score (add up the points)	

SL-8.2: The Berlin Questionnaire

The Berlin Questionnaire is comprised of 3 categories and ten questions. Two or more categories with a positive score indicate high probability of OSA.

Patient BMI - _____	
Category 1	Category 2
1. Do you snore? a. Yes b. No c. Don't know <i>If you snore:.....</i>	6. How often do you feel tired or fatigued after your sleep a. Nearly every day b. 3-4 times a week c. 1-2 times a week d. 1-2 times a month e. Never or nearly never
2. Your snoring is: a. Slightly louder than breathing b. As loud as talking c. Louder than talking d. Very loud-can be heard in adjacent rooms	7. During your waking time, do you feel tired, fatigued, or not up to par? a. Nearly every day b. 3-4 times a week c. 1-2 times a week d. 1-2 times a month e. Never or nearly never
3. How often do you snore? a. Almost every day b. 3-4 times a week c. 1-2 times a week d. 1-2 times a month e. Never or almost never	8. Have you ever nodded off or fallen asleep while driving a vehicle a. Yes b. No <i>If yes:</i>
4. Does your snoring bother other people? a. Yes b. No c. Don't know	9. How often does this occur? a. Nearly every day b. 3-4 times a week c. 1-2 times a week d. 1-2 times a month e. Never or nearly never
5. Has anyone noticed that you quit breathing during your sleep? a. Nearly every day b. 3-4 times a week c. 1-2 times a week d. 1-2 times a month e. Never or nearly never	Category 3 a. Do you have high blood pressure? b. Yes c. No Don't know

Berlin Questionnaire Scoring

- **Category 1:** Items 1-5
 - ◆ Item 1: if 'Yes', assign **1 point**
 - ◆ Item 2: if 'c' or 'd' is the response, assign **1 point**
 - ◆ Item 3: if 'a' or 'b' is the response, assign **1 point**
 - ◆ Item 4: if 'a' is the response, assign **1 point**
 - ◆ Item 5: if 'a' or 'b' is the response, assign **2 points**
 - ◆ Add Points. Category 1 is positive if the total score is 2 or more points.
- **Category 2:** Items 6, 7, 8 (item 9 should be noted separately)
 - ◆ Item 6: if 'a' or 'b' is the response, assign **1 point**
 - ◆ Item 7: if 'a' or 'b' is the response, assign **1 point**
 - ◆ Item 8: if 'a' is the response, assign **1 point**
 - ◆ Add Points. Category 2 is positive if the total score is 2 or more points
- **Category 3:** is positive if the answer to Item 10 is 'Yes" **OR** if the BMI of the patient is greater than 30kg/m2.
- **High Risk:** if there are 2 or more Categories where the score is positive
- **Low Risk:** if there is only 1 or no Categories where the score is positive

SL-8.3: STOP Bang

STOP Bang questionnaire has eight yes/no questions. A “yes” answer on three or more questions indicates high probability of OSA.

Snoring

1. Do you snore loudly (louder than talking or loud enough to be heard through closed doors?)

Tired

2. Do you often feel tired, fatigued, or sleepy during daytime?

Observed

3. Has anyone observed you stop breathing during your sleep?

Blood Pressure

4. Do you have or are you being treated for high blood pressure?

BMI

5. BMI higher than 35kg/m²

Age

6. Age over 50 years old?

Neck Circumference

7. Neck circumference greater than 40cm?

Gender

8. Gender male?

- Intermediate to High risk of OSA: answering “yes” to three or more items. Please see note below for score of three or greater.**
- Low risk of OSA: answering “yes” to less than three items

**** Practice Note: High Risk is determined by either one of the following:**

- Answering “yes” to two or more of four STOP questions + any one BANG question except age OR
- Answering “yes” to 5 or more questions

SL-8.4: Insomnia Severity Index

The Insomnia Severity Index has seven questions. The seven answers are added up to get a total score. When you have your total score, look at the 'Guidelines for Scoring/Interpretation' at the bottom of the Insomnia Severity Index page to see where your sleep difficulty fits. Print out a copy of your completed Insomnia Severity Index to take to your health care provider.

For each question, please **CIRCLE** the number that best describes your answer. [Click here to print the Insomnia Severity Index.](#)

Please rate the **CURRENT (i.e. LAST 2 WEEKS) SEVERITY** of your insomnia problem(s).

Insomnia problem	None	Mild	Moderate	Severe	Very severe
1. Difficulty falling asleep	0	1	2	3	4
2. Difficulty staying asleep	0	1	2	3	4
3. Problem waking up too early	0	1	2	3	4

4. How **SATISFIED/DISSATISFIED** are you with your **CURRENT** sleep pattern?

Very Satisfied	Satisfied	Moderately Satisfied	Dissatisfied	Very Dissatisfied
0	1	2	3	4

5. How **NOTICEABLE** to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all Noticeable	A Little	Somewhat	Much	Very Much Noticeable
0	1	2	3	4

6. How **WORRIED/DISTRESSED** are you about your current sleep problem?

Not at all Worried	A Little	Somewhat	Much	Very Much Worried
0	1	2	3	4

7. To what extent do you consider your sleep problem to **INTERFERE** with your daily functioning (e.g. daytime fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) **CURRENTLY**?

Not at all Interfering	A Little	Somewhat	Much	Very Much Interfering
0	1	2	3	4

Guidelines for Scoring/Interpretation:

Add the scores for all seven items (questions 1 + 2 + 3 + 4 + 5 + 6 + 7) = _____ your total score.

Total score categories:

0-7 = No clinically significant insomnia

8-14 = Sub threshold insomnia

15-21 = Clinical insomnia (moderate severity)

22-28 = Clinical insomnia (severe)

SL-9: Oral Appliances for the Treatment of Obstructive Sleep Apnea

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SL 9.1.2: Custom-fit Oral Appliances Indications	44
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Treatment Codes (HCPCS and CPT®)	CODE
Oral device/appliance used to reduce upper airway collapsibility, adjustable or non-adjustable, prefabricated, includes fitting and adjustment	E0485
Oral device/appliance used to reduce upper airway collapsibility, adjustable or non-adjustable, custom fabricated, includes fitting and adjustment	E0486
Non-covered item or service (Used for oral appliances that do not incorporate all of the criteria as set forth in the Policy Article; tongue-retaining or tongue-positioning devices; and devices that are used only to treat snoring without a diagnosis of obstructive sleep apnea)	A9270
Durable medical equipment, miscellaneous	E1399

SL-9.1: Custom-fit Oral Appliances

SL 9.1.1: General Information

- Continuous positive airway pressure is the gold standard for treatment of obstructive sleep apnea.⁴³ Oral appliances are an alternative treatment option for patients who are intolerant to PAP therapy or who prefer an alternative to CPAP.⁴³ Subjective adherence and side effect profile are improved with oral appliances compared to CPAP. However, CPAP results in a greater reduction in respiratory events (AHI, RDI or REI) and greater improvement in oxygen saturation. Oral appliances significantly reduce apnea hypopnea index regardless of severity of obstructive sleep apnea, although patients with moderate to severe OSA are more likely to achieve their target AHI with CPAP compared to the oral appliance.⁴³ Both oral appliances and CPAP improve excessive daytime sleepiness, quality of life, and cognitive performance.^{43, 44, 45}
 - ◆ The AASM task force indicates that use of oral appliances in patients with severe obstructive sleep apnea should be reserved for clinical scenarios where CPAP is not tolerated **or** does not provide benefit.⁴³
- The most common oral appliance utilized for the treatment of obstructive sleep apnea is the mandibular advancement device.⁴⁴ There was insufficient evidence for the AASM task force to assess the efficacy of tongue retaining devices, which are also less well tolerated.^{43,44} Custom-made mandibular advancement devices appliance are more effective for symptom improvement, compliance and tolerance compared to ready-made appliances.^{43,46}

SL 9.1.2: Custom-fit Oral Appliances Indications

- Custom-fit oral appliances are indicated when all of the following are met:
 - ◆ A positive diagnosis of obstructive sleep apnea on a covered sleep study as demonstrated by one of the following:
 - AHI, RDI, or REI $\geq 5 \leq 14$ events per hour and documentation of:
 - Excessive daytime sleepiness, impaired cognition, mood disorders, or insomnia, or
 - Hypertension, ischemic heart disease, or history of stroke; **OR**
 - AHI, RDI, or REI $\geq 15 \leq 30$ events per hour with a minimum of 30 events over the duration of the sleep test;
 - AHI, RDI, or REI AHI > 30 events per hour
 - ◆ Documentation of:
 - Intolerance or lack of benefit after a minimum of a one month trial of PAP, **or**

- PAP is contraindicated for the patient as documented by the treating physician, **or**
 - Patient prefers alternative treatment to CPAP **AND** AHI, RDI, or REI is less than 30.
 - ◆ The device is ordered by the treating physician following a face to face visit and review of sleep study results.
 - ◆ A qualified licensed dentist (DDS and DMD) provides a custom device and follow-up to assess for dental-related side effects.
- Note: Oral devices to prevent temporomandibular joint (TMJ) disorders are considered experimental, investigational, and/or unproven (EIU).

SL-9.2: Pediatric Patients

- Oral appliances may be considered medically necessary in the treatment of children with craniofacial anomalies with signs and symptoms of OSA.
- Oral appliances are considered EIU for the treatment of OSA in children not meeting the above criteria.

SL-10: Surgical Treatment of Obstructive Sleep Apnea in Adults

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Uvulopalatopharyngoplasty	
Uvulectomy, excision of uvula	42140
Palatopharyngoplasty (eg, uvulopalatopharyngoplasty, uvulopharyngoplasty)	42145
Reconstruction of mandibular rami, horizontal, vertical, C, or L osteotomy; without bone graft	21193
Reconstruction of mandibular rami, horizontal, vertical, C, or L osteotomy; with bone graft (includes obtaining graft)	21194
Reconstruction of mandibular rami and/or body, sagittal split; without internal rigid fixation	21195
Reconstruction of mandibular rami and/or body, sagittal split; with internal rigid fixation	21196
Osteotomy, mandible, segmental;	21198
Osteotomy, mandible, segmental; with genioglossus advancement	21199
Osteotomy, maxilla, segmental (eg, Wassmund or Schuchard)	21206
Osteoplasty, facial bones; augmentation (autograft, allograft, or prosthetic implant)	21208
Hyoid myotomy and suspension	21685
Excision inferior turbinate, partial or complete, any method	30130
Submucous resection inferior turbinate, partial or complete, any method	30140
Septoplasty or submucous resection, with or without cartilage scoring, contouring or replacement with graft	30520
Ablation, soft tissue of inferior turbinates, unilateral or bilateral, any method (eg, electrocautery, radiofrequency ablation, or tissue volume reduction); superficial	30801
Ablation, soft tissue of inferior turbinates, unilateral or bilateral, any method (eg, electrocautery, radiofrequency ablation, or tissue volume reduction); intramural (i.e., submucosal)	30802
Glossectomy; less than one-half tongue	41120
Fixation of tongue, mechanical, other than suture (eg, K-wire)	41500
Tongue base suspension, permanent suture technique	41512
Submucosal ablation of the tongue base, radiofrequency, 1 or more sites, per session	41530
Unlisted procedure, palate, uvula	42299
Pharyngoplasty (plastic or reconstructive operation on pharynx)	42950
Application of interdental fixation device for conditions other than fracture or dislocation, includes removal	21110
Reconstruction midface, LeFort I; single piece, segment movement in any direction (eg, for Long Face Syndrome), without bone graft	21141
Reconstruction midface, LeFort I; single piece, segment movement in any direction, requiring bone grafts (includes obtaining autografts)	21145
Reconstruction of mandibular rami and/or body, sagittal split; with internal rigid fixation	21196

Tracheostomy	
Tracheostomy, planned (separate procedure);	31600
Tracheostomy, planned (separate procedure); younger than 2 years	31601
Tracheostomy, emergency procedure; transtracheal	31603
Tracheostomy, emergency procedure; cricothyroid membrane	31605
Tracheostomy, fenestration procedure with skin flaps	31610
Hypoglossal nerve stimulation	
Insertion of chest wall respiratory sensor electrode or electrode array, including connection to pulse generator (List separately in addition to code for primary procedure)	0466T
Revision or replacement of chest wall respiratory sensor electrode or electrode array, including connection to existing pulse generator	0467T
Removal of chest wall respiratory sensor electrode or electrode array	0468T

SL-10.1: Introduction

- Although positive airway pressure is the first line therapy for obstructive sleep apnea, a percentage of patients are unable to achieve adherence to positive airway pressure.⁴⁹ Other therapeutic options include oral appliances, positional therapy, surgical treatment, and lifestyle modifications such as weight loss. Surgical treatment options aim to reduce nasal, oropharyngeal, and hypopharyngeal obstruction.⁵⁰
- As a general rule, CPAP and other non-invasive therapeutic options should be considered and/or attempted prior to consideration of surgical treatment. There may be special circumstances, such as significant craniofacial abnormalities, that preclude a trial of non-invasive management.

SL-10.2: Uvulopalatopharyngoplasty

- Uvulopalatopharyngoplasty (UPPP) is a surgical procedure that aims to treat obstructive sleep apnea by increasing the retropalatal airspace via shortening or removing the uvula and soft palate and, possibly, tonsillar removal.⁵¹ Randomized controlled trials have demonstrated 50% to 60% reduction in AHI with UPPP in selected patients.^{52,53} However, UPPP does not reliably normalize apnea hypopnea index in moderate to severe obstructive sleep apnea.⁵⁴ As a result, positive airway pressure and oral appliances are recommended for initial treatment.⁵⁴ Accurate predictors of surgical success in UPPP have been debated, with consideration given to severity of obstructive sleep apnea as well as anatomical factors and BMI.^{55,56} Friedman proposed a staging system for stratification of patients based on likelihood of surgical success, utilizing palate position, tonsil size and body mass index (see table).⁵⁶ Likelihood of surgical success (defined as a post-operative RDI < 20 and RDI reduction of ≥ 50%) was 80.6% for Friedman Stage 1, 37.9% for Friedman Stage II, and 8.1% for Friedman Stage III.⁶ Based on a recent meta-analysis, Friedman stage I predicts surgical success, while Friedman Stage III and low hyoid position are negative predictors.⁵⁷

Table (Adapted from ^{51, 52})

Stage	Friedman Tongue Position	Tonsil Size	BMI
I	1	3,4	<40
	2	3,4	
II	1,2	0,1,2	<40
	3,4	3,4	
III	3	0,1,2	<40
	4	0,1,2	
IV	1,2,3,4	0,1,2,3,4	>40

- UPPP may be considered when **all** of the following are met:
 - ◆ A positive diagnosis of moderate to severe obstructive sleep apnea as demonstrated by AHI > 15
 - ◆ Documentation of **both** of the following, each over a minimum of a one month trial period:
 - Failed trial of positive airway pressure either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side effects, inadequate symptom control) and/or objective (i.e. titration results and/or downloaded data reports) assessment of response to PAP
 - Failed trial of oral appliance either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side effects, inadequate symptom control) and/or objective (i.e. repeat sleep testing) assessment of response to oral appliance
 - ◆ Appropriate anatomy-based staging, as determined by an otolaryngologist (eg: Friedman Stage I)
 - ◆ BMI < 40
 - ◆ Patient has undergone evaluation by both a sleep clinician and an otolaryngologist and considered an appropriate candidate
- Patients with symptomatic mild obstructive sleep apnea, as defined in **SL-1.1: General Requirements**, will be considered on a case by case basis

SL-10.3: Maxillomandibular Advancement

- Maxillomandibular advancement (MMA) is a surgical procedure that enlarges the nasopharyngeal, retropalatal and hypopharyngeal airway by moving the maxilla and mandible forward, which can be effective in treating obstructive sleep apnea in select patient populations.^{58,59,60} Improvement in apnea hypopnea index (AHI) with MMA is similar to CPAP.⁶¹ Factors that may impact surgical success include patient age, neck girth, baseline apnea hypopnea index, presence of mandibular retrognathia, body mass index, and results of cephalometric testing.^{61,62,63,64}
- MMA may be considered when **all** of the following are met:
 - ◆ A positive diagnosis of moderate to severe obstructive sleep apnea as demonstrated by AHI > 15
 - ◆ Documentation of **both** of the following, each over a minimum of a one month trial period:
 - Failed trial of positive airway pressure either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side

- effects, inadequate symptom control) and/or objective (i.e. titration results and/or downloaded data reports) assessment of response to PAP
- Failed trial of oral appliance either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side effects, inadequate symptom control) and/or objective (i.e. repeat sleep testing) assessment of response to PAP
- ◆ Hypopharyngeal narrowing, as determined by a maxillofacial surgeon via cephalometric testing or other
- ◆ Patient has undergone evaluation by both a sleep clinician and a maxillofacial surgeon and considered an appropriate candidate
- Patients with symptomatic mild obstructive sleep apnea, as defined in **SL-1.1: General Requirements**, will be considered on a case by case basis

SL-10.4: Multi-level or Step-wise Surgeries for treatment of OSA

- Multi-level simultaneous or step-wise surgeries attempt to address different areas of airway collapse and may include nasal, palatal or tongue surgeries.^{65,66} Combinations of procedures may include UPPP and/or MMA (addressed in previous guidelines), and a variety of other procedures including hyoid suspension and tongue based procedures (i.e. genioglossus advancement, radiofrequency ablation of the tongue, others). These procedures may be performed simultaneously or individually in a staged fashion. Success rates are variable and have been associated with factors such as BMI and AHI, with patients with lower BMI's likely experiencing improved surgical outcomes.^{67,68,69} One study reported > or = 50% reduction in RDI or achievement of RDI < 20 in 70% of patients who underwent genioglossus advancement and hyoid myotomy.⁷⁰ The American Academy of Sleep Medicine indicates that the quality of evidence is low for multi-level or stepwise surgery, although it remains an option for patients with obstruction at multiple sites, particularly if they have failed UPPP.^{66,71}
- Multi-level simultaneous or step-wise surgeries may be considered on a case-by-case basis when **all** of the following are met:
 - ◆ A positive diagnosis of moderate to severe obstructive sleep apnea as demonstrated by AHI > 15
 - ◆ Documentation of both of the following, each over a minimum of a one month trial period:
 - Failed trial of positive airway pressure either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side effects, inadequate symptom control) and/or objective (i.e. titration results and/or downloaded data reports) assessment of response to PAP
 - Failed trial of oral appliance either due to insufficient OSA control or intolerability, as demonstrated by documentation of subjective (i.e. side effects, inadequate symptom control) and/or objective (i.e. repeat sleep testing) assessment of response to PAP
 - ◆ Patient has undergone evaluation by both a sleep clinician and an otolaryngologist and considered an appropriate candidate
- Patients with symptomatic mild obstructive sleep apnea, as defined in **SL-1.1: General Requirements**, will be considered on a case by case basis

SL-10.5: Hypoglossal nerve stimulation

Hypoglossal Nerve Stimulation - Coding

Procedure	Description	CPT® Code
Generator and Lead	Incision for implantation of cranial nerve neurostimulator electrode array and pulse generator	64568
Cranial nerve neurostimulator removal	Removal of cranial nerve neurostimulator electrode array and pulse generator	64570
Cranial nerve neurostimulator revision or replacement	Revision or replacement of cranial nerve neurostimulator electrode array, including connection to existing pulse generator	64569
Chest Wall Respiratory Sensor	Insertion of chest wall respiratory sensor	0466T
Chest Wall Sensor Respiratory Sensor Revision or Replacement	Revision or replacement of chest wall respiratory sensor electrode or electrode array, including connection to existing pulse generator	0467T
Chest Wall Respiratory Sensor Removal	Removal of chest wall respiratory sensor electrode or electrode array	0468T
System Check	Electronic analysis of implanted neurostimulator pulse generator system	95970

- A hypoglossal nerve stimulator (Inspire®) is a surgically implanted device that delivers stimulating electrical pulses to the hypoglossal nerve, which controls upper airway musculature. With a sensing lead, the device permits synchronization with ventilatory effort. The Stimulation Treatment for Apnea Reduction (STAR) trial was a prospective, multicenter trial of 126 participants with a body mass index less than 32, moderate to severe obstructive sleep apnea (AHI 20-50), and difficulty tolerating/adhering to CPAP. Patients were excluded for the following reasons: 1) AHI outside of the pre-specified range, 2) > 25% central or mixed respiratory events 3) complete concentric collapse on endoscopy performed during drug-induced sleep 4) marked anatomical abnormalities on surgical consultation preventing effective use or evaluation of upper airway stimulation such as tonsil size of 3 or 4. Participants, who served as their own control, experienced a significant reduction in Apnea Hypopnea Index with hypoglossal nerve stimulation (68% decrease) and oxygen desaturation index (70% decrease) at 12 months, as well as a reduction in self-reported outcomes at 12 and 24 months.^{72,73} These improvements were maintained at 3 years.⁷⁴ During the trial, a response to hypoglossal nerve stimulation was defined as a reduction of AHI by at least 50% from baseline and an AHI of less than 20 events per hour at one year.⁷² In June 2017, the Food and Drug administration revised the criteria to include patients with AHI between 15 and 65.
- Implantation of hypoglossal nerve stimulation can be considered if **all** of the following are met:
 - ◆ Age ≥ 22
 - ◆ Moderate to severe obstructive sleep apnea, with apnea hypopnea index on polysomnography between 15 and 65 with less than 25% central apneas

- ◆ Failure of alternative therapies for the treatment of obstructive sleep apnea due to **both**:
 - Inability or unwillingness to use CPAP and/or bilevel PAP after a minimum of a one month trial, as demonstrated by documentation of subjective (i.e. side effects or device-related problems) and/or objective (i.e. titration study results and/or downloaded data reports) assessment of response to PAP and
 - Failure of other non-invasive treatments for obstructive sleep apnea, or documentation that alternative treatments were considered and deemed inappropriate, including oral appliance therapy
- ◆ BMI $\leq$ 32
- ◆ Absence of complete concentric collapse on drug induced endoscopy
- ◆ Surgical consultation indicating absence of other anatomical findings that would interfere with performance or evaluation of the device
- Guidelines for the polysomnographic testing pre- and post-implantation are covered in section SL-2.2

SL-10.6: Tracheostomy

- Tracheostomy treats obstructive sleep apnea by surgically bypassing upper airway obstruction.⁷⁵ It is highly effective for the treatment of obstructive sleep apnea, but it is considered a treatment of last resort due to significant impact on patient quality of life, as well as the existence of highly effective, less invasive treatments for OSA ^{75,76} In keeping with the American Academy of Sleep Medicine guidelines, tracheostomy will only be considered for the treatment of the most severe obstructive sleep apnea in the absence and/or failure of all other options or when the surgery is determined to be clinically urgent.

SL-11: Surgical Treatment of Obstructive Sleep Apnea in Children

SL 11.1: Adenotonsillectomy-general information	54
SL 11.2: Adenotonsillectomy	54

Adenotonsillectomy	CPT® Code
Tonsillectomy and adenoidectomy; younger than age 12	42820
Tonsillectomy and adenoidectomy; age 12 or over	42821
Tonsillectomy, primary or secondary; younger than age 12	42825
Tonsillectomy, primary or secondary; age 12 or over	42826
Adenoidectomy, primary; younger than age 12	42830
Adenoidectomy, primary; age 12 or over	42831

SL 11.1: Adenotonsillectomy-general information

- Adenotonsillar hypertrophy is the most common cause of obstructive sleep apnea (OSA) in the pediatric population.^{13,14*} Adenotonsillectomy (AT) is first line treatment for pediatric OSA.^{13,15} Compared with watchful waiting, AT in school age children reduces symptoms of OSA and improves behavior, quality of life, and polysomnographic findings.¹⁶ Severe OSA (Apnea Hypopnea Index >10) also improves with AT.¹⁷ Higher apnea hypopnea index and obesity are risk factors for persistent obstructive sleep apnea post-surgically.¹³ Long term follow-up has demonstrated increasing apnea hypopnea index over time post-surgically, and mixed improvement in quality of life in studies with > 6 months follow-up.^{18,19} Regular assessment of nasal breathing, sucking, swallowing, masticating and phonation for normal development is recommended to decrease the incidence of obstructive sleep apnea in children.²⁰ AT alone is not typically effective for treatment of OSA in adults.²¹

SL 11.2: Adenotonsillectomy

- Adenotonsillectomy may be considered in pediatric patients (Age 17 years or younger) when **all** of the following are met:
 - ◆ Diagnosis of obstructive sleep apnea as demonstrated by both of the following:
 - The presence of one or more of the following:
 - Snoring
 - Labored, paradoxical or obstructed breathing during the child's sleep
 - Sleepiness, hyperactivity, behavioral problems, or learning problems
 - PSG demonstrates one or more of the following:
 - one or more obstructive apneas, mixed apneas, or hypopneas per hour of sleep or
 - A pattern of obstructive hypoventilation defined as at least 25% of total sleep time with hypercapnia (PaCO₂ > 50 mm Hg) in association with one or more of the following:
 - snoring
 - flattening of the inspiratory nasal pressure waveform
 - paradoxical thoracoabdominal motion.
 - ◆ Adenotonsillar hypertrophy as demonstrated by detailed upper airway examination by an otolaryngologist

* Refer to Pediatric References

SL-12: Surgical Treatment of Central Sleep Apnea

SL-12.1: Phrenic Nerve Stimulation for Central Sleep Apnea-General Information	56
SL-12.1.1: Central sleep apnea and heart failure-general information	57
SL-12.2: Phrenic Nerve Stimulation for Central Sleep Apnea-Indications	57

Phrenic Nerve Stimulation for Central Sleep Apnea	CPT® Code
Insertion or replacement of neurostimulator system for treatment of central sleep apnea; complete system (transvenous placement of right or left stimulation lead, sensing lead, implantable pulse generator)	0424T
Insertion or replacement of neurostimulator system for treatment of central sleep apnea; sensing lead only	0425T
Insertion or replacement of neurostimulator system for treatment of central sleep apnea; stimulation lead only	0426T
Insertion or replacement of neurostimulator system for treatment of central sleep apnea; pulse generator only	0427T
Removal of neurostimulator system for treatment of central sleep apnea; pulse generator only	0428T
Removal of neurostimulator system for treatment of central sleep apnea; sensing lead only	0429T
Removal of neurostimulator system for treatment of central sleep apnea; stimulation lead only	0430T
Removal and replacement of neurostimulator system for treatment of central sleep apnea, pulse generator only	0431T
Repositioning of neurostimulator system for treatment of central sleep apnea; stimulation lead only	0432T
Repositioning of neurostimulator system for treatment of central sleep apnea; sensing lead only	0433T
Interrogation device evaluation implanted neurostimulator pulse generator system for central sleep apnea	0434T
Programming device evaluation of implanted neurostimulator pulse generator system for central sleep apnea; single session	0435T
Programming device evaluation of implanted neurostimulator pulse generator system for central sleep apnea; during sleep study	0436T

SL-12.1: Phrenic Nerve Stimulation for Central Sleep Apnea-General Information

- The Remede® system, which was cleared by the Food and Drug Administration in 2017, is an implantable device that transvenously stimulates the phrenic nerve to restore normal breathing via diaphragmatic contraction in patients with central sleep apnea.⁷⁷ A randomized, controlled trial of patients with moderate to severe central sleep apnea, including patients with heart failure, demonstrated that greater than 50% of patients experienced a reduction in AHI of 50% or greater from baseline.⁷⁸ Patients with phrenic nerve stimulation also experienced improvements in percent of rapid eye movement sleep, arousal index, and Epworth sleepiness score.⁷⁸

SL-12.1.1: Central sleep apnea and heart failure-general information

- Treatment of central sleep apnea in heart failure patients with reduced ejection fraction remains controversial.⁷⁹ American Academy of Sleep Medicine (AASM) guidelines for the treatment of central sleep apnea indicate that CPAP targeted to normalize apnea hypopnea index is a standard for the initial treatment of CHF-related central sleep apnea, based on post-hoc analysis from the CAN-PAP trial.^{80,81} Bi-level PAP-ST, ASV, and oxygen therapy are alternative options for treatment of central sleep apnea, although oxygen does not address comorbid obstructive sleep apnea.^{79,80}
- ASV is contraindicated in patients with reduced EF (less than or equal to 45%) in heart failure, based on the SERV-HF trial and the updated AASM practice parameter.^{82,83}

SL-12.2: Phrenic Nerve Stimulation for Central Sleep Apnea-Indications

- **All** of the following criteria must be met prior to performance of implantation of phrenic nerve stimulation for treatment central sleep apnea:
 - ◆ Polysomnography must demonstrate moderate to severe central sleep apnea as evidenced by **all** of the following:
 - Apnea Hypopnea Index of > or equal to 20 events per hour
 - Central apneas of 50% or higher of all apneas, with at least 30 central apnea events throughout the night
 - Obstructive apnea of 20% or lower of total AHI
 - ◆ Absence of advanced renal disease, AHA Stage D heart failure (defined as continued signs and symptoms of CHF despite treatment and therapy), a recent cerebrovascular event (within the past 12 months), and presence of central sleep apnea related to opioids
 - ◆ Lack of efficacy or tolerability of **both** of the following, unless the patient has a known contraindication to PAP:
 - CPAP
 - Bilevel PAP-ST (ASV can be used as an alternative only in patients with preserved EF - see note**)
 - **Both patients with preserved EF or reduced EF (less than or equal to 45%) can undergo a trial of CPAP and bilevel PAP-ST targeted to achieve an AHI less than 15 to determine efficacy prior to phrenic nerve stimulation. As indicated above, ASV is contraindicated in patients with reduced EF in heart failure.^{79,83}

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