# Diagnosis and Treatment of Obstructive Sleep Apnea in Pediatric Individuals

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| **Application:** | All participating hospitals and providers |
| **Page Number(s):** | 1 of 12 |

## Disclaimer

Highmark Health Options medical policy is intended to serve only as a general reference resource regarding coverage for the services described. This policy does not constitute medical advice and is not intended to govern or otherwise influence medical decisions.

### POLICY STATEMENT

Highmark Health Options may provide coverage under medical surgical benefits of the Company's Medicaid products for medically necessary diagnosis and treatment of obstructive sleep apnea in pediatric individuals.

This policy is designed to address medical necessity guidelines that are appropriate for the majority of individuals with a particular disease, illness or condition. Each person's unique clinical circumstances warrant individual consideration, based upon review of applicable medical records.

The qualifications of the policy will meet the standards of the National Committee for Quality Assurance (NCQA) and the Delaware Department of Health and Social Services (DHSS) and all applicable state and federal regulations.

### DEFINITIONS

**Highmark Health Options (HHO)** – Managed care organization serving vulnerable populations that have complex needs and qualify for Medicaid. Highmark Health Options members include individuals and families with low income, expecting mothers, children, and people with disabilities. Members pay nothing to very little for their health coverage. Highmark Health Options currently services Delaware Medicaid: Delaware Healthy Children Program (DHCP) and Diamond State Health Plan Plus LTSS (DSHP Plus LTSS) members.

**Obstructive Sleep Apnea (OSA) in pediatric individuals** – A disorder of breathing during sleep characterized by prolonged partial upper airway obstruction and/or intermittent complete obstruction (obstructive apnea) that disrupts normal ventilation during sleep and normal sleep patterns.

### PROCEDURES

A prior authorization may be required.

For the purposes of this policy the treatment of OSA may be considered medically necessary when ANY of the following conditions are met:

- A pediatric individual is defined as one (1) through seventeen (17) years of age
- Clinically significant OSA for pediatric individuals is defined as follows:
  - Apnea Hypopnea Index (AHI) or Respiratory Disturbance Index (RDI) of at least 5 per hour; or
  - AHI or RDI of at least 1.5 per hour with excessive daytime sleepiness, behavioral problems, or hyperactivity.
- Attended PSG performed on standard equipment is the diagnostic test of choice for the pediatric patient because it is the only technique shown to quantify the ventilatory and sleep abnormalities associated with sleep-disordered breathing.

**DIAGNOSTIC CRITERIA**

Diagnosis of OSA in pediatric individuals is made when ALL the following criteria are met:

- The caregiver reports EITHER:
  - Snoring, or
    - **NOTE**: Socially disruptive snoring is not a disease, illness, or injury
  - Labored breathing; or
  - Obstructed breathing during the pediatric individual's sleep; and
- The caregiver has observed ONE OR MORE of the following:
  - Aggressive behavior; or
  - Diaphoresis; or
  - Excessive daytime sleepiness; or
  - Hyperactivity; or
  - Morning headaches; or
  - Movement arousals; or
  - Neck hyperextension during sleep; or
  - Paradoxical inward rib cage motion during inspiration; or
  - Secondary enuresis; or
  - Slow growth; and
- Polysomnography (PSG) reveals one or more obstructive apneas or hypopneas per hour of sleep; and
- PSG demonstrates EITHER of the following:
  - Frequent arousals from sleep associated with increased respiratory effort, oxyhemoglobin desaturation associated with apnea, hypercapnia during sleep, or markedly negative esophageal pressure swings; or
  - Periods of hypercapnia, oxyhemoglobin desaturation, or both during sleep that are associated with snoring, paradoxical inward rib cage motion during inspiration, and either frequent arousals from sleep or markedly negative esophageal pressure swings; and
- The pediatric individual's findings are not better explained by another sleep disorder, medical disorder, neurological disorder, medication, or substance abuse.

**DIAGNOSTIC TESTING**
**HOME/UNATTENDED SLEEP STUDIES**

The following diagnostic studies for the diagnosis of OSA in pediatric individuals are considered experimental/investigational because the safety and/or effectiveness of these services cannot be established by the available published peer-reviewed literature, may include but are not limited to:

- Unattended home PSGs; or

- Unattended portable PSGs; or
- Other Screening techniques including but not limited to the following:
  - Actigraphy; or
  - Audio taping and videotaping; or
  - Daytime nap PSG; or
  - Questionnaires (clinical assessment); or
  - Radiological evaluation; or
  - Multiple sleep latency testing (MSLT)/Maintenance of wakefulness test (MWT)

**FACILITY/LABORATORY ATTENDED PSG**
**PSG**

Attended PSG for pediatric individuals meeting ANY ONE of the following criteria may be considered medically necessary:

- The caregiver has observed ONE OR MORE of the following:
  - Aggressive behavior; or
  - Diaphoresis; or
  - Excessive daytime sleepiness; or
  - Failure to thrive; or
  - Hyperactivity; or
  - Morning headaches; or
  - Movement arousals; or
  - Neck hyperextension during sleep; or
  - Paradoxical rib cage motion during inspiration; or
  - Secondary enuresis.

AND one or more of the following:

- Differentiation of benign or primary snoring from pathological snoring; or
- Evaluation of:
  - Cor pulmonale; or
  - Disturbed sleep patterns; or
  - Excessive daytime sleepiness; or
  - Failure to thrive; or
  - Polycythemia unexplained by other factors or conditions; or
- When clinical exam is not sufficient to determine that surgery is indicated; or
- Determination of need for intensive postoperative monitoring following adenotonsillectomy or other pharyngeal surgery; or
- Known history of OSA exhibiting persistent snoring or other symptoms of sleep disordered breathing despite therapy; or
- Titration of continuous positive airway pressure (CPAP) levels.

PSG may be considered medically necessary when evaluating individuals with parasomnias when there is a history of sleep related injurious or potentially injurious disruptive behaviors.
PSG in pediatric individuals not meeting the criteria as indicated in this policy is considered not medically necessary for ANY of the following:

- Routine evaluation of adenotonsillar hypertrophy alone without other clinical signs or symptoms suggestive of obstructive sleep disordered breathing; or
- Routine follow-up of post-adenotonsillectomy with resolved symptoms.

**Repeat PSG**

Repeat PSG in pediatric individuals may be considered medically necessary when any of the following are met:

- Initial PSG is inadequate or nondiagnostic and the accompanying caregiver reports that the pediatric individual's sleep and breathing patterns during the testing were not representative of their sleep at home; or
- A pediatric individual with previously diagnosed and treated OSA who continues to exhibit persistent snoring or other symptoms of sleep disordered breathing; or
- Six to eight weeks post-adenotonsillectomy or other pharyngeal surgery for OSA and severe OSA was present on pre-operative PSG (AHI or RDI greater than 10; or
- Other symptoms related to pre-operative sleep disordered breathing persist or recur; or
- To periodically re-evaluate the appropriateness of CPAP settings based on the pediatric individual's growth pattern or the presence of recurrent symptoms while on CPAP; or
- Significant weight loss has been achieved and repeat testing may be indicated to determine the need for continued therapy.

An electroencephalogram (EEG), electro-oculogram (EOG), submental electromyogram (EMG), electrocardiogram (EKG), and oximetry are the most common parameters of sleep measured during a polysomnogram. Therefore, separate payment should not be made for these parameters when reported with a polysomnogram on the same day by the same provider.

Sleep studies and PSG should not be reported when the service provided is a pediatric pneumogram.

Repeat PSG in pediatric individuals not meeting the criteria indicated in this policy is considered not medically necessary.

**PSG/RLS CRITERIA**

PSG may be considered medically necessary for the diagnosis of periodic limb movement disorder when ALL the following are criteria met:

- A complaint of repetitive limb movement during sleep by the individual or an observer; and
- No other concurrent sleep disorder; and
- At least ONE of the following is present:
  - Frequent awakenings; or
  - Fragmented sleep; or
  - Difficulty maintaining sleep; or
  - Excessive daytime sleepiness.

PSG not meeting the criteria as indicated in the policy is considered not medically necessary.

**MULTIPLE SLEEP LATENCY TESTING (MSLT)**

AFTER OSA has been ruled out by PSG, multiple sleep latency testing (MSLT) may be considered medically necessary in pediatric individuals for ANY of the following:

- Narcolepsy; or
- Suspected idiopathic hypersomnia; or
- When performed for ANY of the following:
  - The first test was invalid or uninterpretable; or
  - The response to treatment needs to be determined; or

- The pediatric individual is suspected of having more than one sleep disorder (e.g., diagnosis of OSA and continues to have excessive daytime sleepiness despite treatment); or
- The most recent prior MSLT test was conducted two (2) or more years ago.

MSLT is considered not medically necessary in pediatric individuals for EITHER of the following:

- For routine follow-up after treatment of sleep related disorder; or
- Portable MSLT performed in the home setting.

**ACTIGRAPHY**

Actigraphy in conjunction with PSG may be considered medically necessary to evaluate sleep disorders for individuals 17 years or younger.

Actigraphy used as a sole technique to record and analyze body movement to evaluate sleep disorders not meeting the criteria as indicated in this policy is considered not medically necessary.

**POSITIVE AIRWAY PRESSURE (PAP)**

CPAP in pediatric individuals may be considered medically necessary in ANY of the following situations:

- In whom adenotonsillectomy is contraindicated; or
- Who have OSA with minimal adenotonsillar tissue; or
- Have persistent OSA despite adenotonsillectomy; or
- For whom there is a strong preference for a nonsurgical approach.

When the above criteria are met:

- Payment will be made for the rental of a CPAP device for the first three (3) months from the original start date of therapy.
- After pediatric individuals have been using a CPAP device for three (3) months are found to be maintaining compliance with its use, and are experiencing success in treatment, payment will be made for the purchase of the device (after the expenses incurred for the first three [3] month's rental has been applied to the purchase price).
  - Compliance is defined as CPAP use of greater than four (4) hours per night of use and greater than or equal to five (5) nights per week, supported by meter readings via built-in monitoring chip.
- **NOTE**: Total payments for a rental item may not exceed its allowable purchase price, except for those items identified as life sustaining DME.

CPAP for pediatric individuals not meeting the criteria as indicated in this policy is considered not medically necessary.

**INTRA-ORAL APPLIANCES**

Intra-oral appliances for the treatment of OSA in pediatric individuals with craniofacial anomalies may be considered medically necessary.

Intra-oral appliances for the treatment of OSA in pediatric individuals with craniofacial anomalies not meeting the criteria as indicated in this policy is considered not medically necessary.

Payment may be made for only one appliance. Additional appliances are considered not medically necessary. Replacement of the appliance is covered in case of loss, irreparable damage, or wear when necessary due to a change in the individual's condition. It will be necessary for the provider to submit medical records and/or additional documentation to determine coverage in this situation.

**SURGICAL TREATMENT**

The following surgical interventions to treat clinically significant OSA in pediatric individuals may be considered medically necessary for ANY of the following:

- Adenoidectomy; or
- Adenotonsillectomy; or
- Tonsillectomy; or
- Uvulopharyngopalatoplasty (UPPP) in pediatric individuals with neuromuscular disorders who are deemed to be at high risk for persistent upper airway obstruction after adenotonsillectomy alone; or
- Other surgical options available for pediatric individual's not responding to usual treatment include:
  - Craniofacial surgery; or
  - Tracheostomy in severe cases.

The following surgical interventions are considered experimental/investigational and therefore non-covered because the safety and/or effectiveness of this service cannot be established by the available published peer-reviewed literature may include but is not limited to:

- Laser-assisted palatoplasty or radiofrequency volumetric tissue reduction of the palatal tissues; or
- Radiofrequency volumetric tissue reduction of the tongue, with or without radiofrequency reduction of the palatal tissues; or
- Palatal stiffening procedures including, but not limited to, cautery-assisted palatal stiffening operation, injection of a sclerosing agent, and the implantation of palatal implants; or
- Tongue base suspension; or
- All other minimally invasive surgical procedures not described above.

**HYPOGLOSSAL NERVE STIMULATION**

Hypoglossal nerve stimulation may be considered medically necessary in adolescents or young adults with Down syndrome and OSA under ANY of the following conditions:

- Age 10 to 21 years; and
- AHI greater than 10 and less than 50 with less than 25 percent central apneas after prior adenotonsillectomy; and
- Have EITHER:
  - A tracheotomy; or
  - Be ineffectively treated with CPAP due to noncompliance, discomfort, un-desirable side effects, persistent symptoms despite compliance use, or refusal to use the device; and
- Body mass index greater than or equal to 95th percentile for age; and
- Non-concentric retropalatal obstruction on drug-induced sleep endoscopy (DISE).

Hypoglossal nerve stimulation for the treatment of OSA not meeting the criteria as indicated in this policy is considered not medically necessary.

**POST-PAYMENT AUDIT STATEMENT**

The medical record must include documentation that reflects the medical necessity criteria and is subject to audit by Highmark Health Options at any time pursuant to the terms of your provider agreement.

**PLACE OF SERVICE: INPATIENT/OUTPATIENT**

Experimental/investigational (E/I) services are not covered regardless of place of service.

Diagnosis and treatment of obstructive sleep apnea in pediatric individuals is typically an outpatient procedure which is only eligible for coverage as an inpatient procedure in special circumstances, including, but not limited to, the presence of a comorbid condition that would require monitoring in a more controlled environment such as the inpatient setting.

**CODING REQUIREMENTS**

**COVERED CODES**

| CPT code | Description |
|---|---|
| 94772 | Circadian respiratory pattern recording (pediatric pneumogram), 12-to-24-hour continuous recording, infant. |
| 95782 | Polysomnography: younger than age 6, sleep staging with 4 or more additional parameters of sleep, attended by a technologist. |
| 95783 | 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. |
| 95805 | Multiple sleep latency or maintenance of wakefulness testing, recording, analysis and interpretation of physiological measurements of sleep during multiple trials to assess sleepiness. |
| 95806 | Sleep study, unattended, simultaneous recording of heart rate, oxygen saturation, respiratory airflow, and respiratory effort (e.g., thoracoabdominal movement). |
| 95807 | Sleep study, simultaneous recording of ventilation, respiratory effort, ECG or heart rate, and oxygen saturation, attended by a technologist. |
| 95808 | Polysomnography: any age, sleep staging with 1-3 additional parameters of sleep, attended by a technologist. |
| 95810 | Polysomnography: age 6 or older, sleep staging with 4 or more additional parameters of sleep, attended by a technologist. |
| 95811 | Polysomnography: age 6 or older, sleep staging with 4 or more additional parameters of sleep, with initiation of continuous positive airway pressure therapy or li-level ventilation, attended by a technologist. |
| E0601 | Continuous positive airway pressure (CPAP) device. |
| E0618 | Apnea monitor, without recording feature. |
| E0619 | Apnea monitor, with recording feature. |
| E0485 | Oral device/appliance used to reduce upper airway collapsibility, adjustable or nonadjustable, prefabricated, includes fitting and adjustment. |
| E0486 | Oral device/appliance used to reduce upper airway collapsibility, adjustable or nonadjustable, custom fabricated, includes fitting and adjustment. |
| 31600 | Tracheostomy, planned (separate procedure). |
| 31601 | Tracheostomy, planned (separate procedure); younger than age 2. |

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| 41512 | Tongue based suspension, permanent suture technique. |
| 41530 | Submucosal ablation of the tongue base, radiofrequency, 1 or more sites, per session. |
| 42140 | Uvulectomy, excision of uvula. |
| 42145 | Palatopharyngoplasty (e.g., uvulopalatopharyngoplasty, uvulopharyngoplasty). |
| 42820 | Tonsillectomy and adenoidectomy; younger than age 12. |
| 42821 | Tonsillectomy and adenoidectomy; age 12 or over. |
| 42825 | Tonsillectomy, primary or secondary; younger than age 12. |
| 42826 | Tonsillectomy, primary or secondary; age 12 or over. |
| 42830 | Adenoidectomy, primary; younger than age 12. |
| 42831 | Adenoidectomy, primary; age 12 or over. |
| 42835 | Adenoidectomy, secondary; younger than age 12. |
| 42836 | Adenoidectomy, secondary; age 12 or over. |
| 64582 | Open implantation of hypoglossal nerve neurostimulator array, pulse generator, and distal respiratory sensor electrode or electrode array. |
| 64583 | Revision or replacement of hypoglossal nerve neurostimulator array and distal respiratory sensor electrode or electrode array, including connection to existing pulse generator. |
| 64584 | Removal of hypoglossal nerve neurostimulator array, pulse generator, and distal respiratory sensor electrode or electrode array. |

**DIAGNOSIS CODES**

**COVERED DIAGNOSIS CODES FOR PROCEDURE CODE E0601**

| Codes | | | | | | |
|---|---|---|---|---|---|---|
| G47.33 | | | | | | |

**COVERED DIAGNOSIS CODES FOR PROCEDURE CODES 95805**

| Codes | | | | | | |
|---|---|---|---|---|---|---|
| G47.411 | G47.419 | G47.421 | G47.429 | | | |

**COVERED DIAGNOSIS CODES FOR PROCEDURE CODES 64582, 64583, 64584**

| Codes | | | | | | |
|---|---|---|---|---|---|---|
| G47.33 | Q90.0 | Q90.1 | Q90.2 | | | |

**NONCOVERED DIAGNOSIS CODE FOR PROCEDURE CODES 41512, 41530, 42140, 42145, 95805, 95806, AND 95807 ARE CONSIDERED EXPERIMENTAL/INVESTIGATIONAL WHEN REPORTED WITH OBSTRUCTIVE SLEEP APNEA.**

| Codes | | | | | | |
|---|---|---|---|---|---|---|
| G47.33 | | | | | | |

**REIMBURSEMENT**

Participating facilities will be reimbursed per their Highmark Health Options contract.

**POLICY SOURCES**

**American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNS) 2016**

The American Academy of Otolaryngology-Head and Neck Surgery considers upper airway stimulation (UAS) via the hypoglossal nerve for the treatment of adult obstructive sleep apnea syndrome to be an effective second-line treatment of moderate to severe obstructive sleep apnea in [individuals] who are intolerant or unable to achieve benefit with positive pressure therapy (PAP). Not all adult [individuals] are candidates for UAS therapy and appropriate polysomnographic, age, BMI and objective upper airway evaluation measures are required for proper patient selection.

**American Academy of Pediatrics (AAP) – 2012**

The American Academy of Pediatrics published guidelines on the diagnosis and management of uncomplicated childhood OSA associated with adenotonsillar hypertrophy and/or obesity in an otherwise healthy [pediatric individual] treated in the primary care setting, which updated the AAP's 2002 guidelines. AAP recommended that all [pediatric individuals] or adolescents be screened for snoring, and PSG is performed in [pediatric individuals] or adolescents with snoring and symptoms or signs of OSA as listed in the guideline. If PSG is not available, an alternative diagnostic test or referral to a specialist may be considered (option). The estimated prevalence rates of OSA in [pediatric individuals] ranged from 1.2% to 5.7%. Adenotonsillectomy was recommended as the first-line treatment for patients with adenotonsillar hypertrophy, and patients should be reassessed clinically postoperatively to determine whether additional treatment is required. High-risk patients should be reevaluated with an objective test or referred to a sleep specialist. CPAP was recommended if adenotonsillectomy was not performed or if OSA persisted postoperatively. Weight loss was recommended in addition to other therapy in patients who are overweight or obese, and intranasal corticosteroids are an option for [pediatric individuals] with mild OSA in whom adenotonsillectomy is contraindicated or for mild postoperative OSA.

**American Academy of Sleep Medicine (AASM)**
**Oral Appliance Therapy – 2015**

The AASM along with the American Academy of Dental Sleep Medicine (AADSM) engaged a seven-member task force for the treatment of OSA and snoring with oral appliance therapy developed recommendations and assigned strengths based on the quality of the evidence counterbalanced by an assessment of the relative benefit of the treatment versus the potential harms. The AASM and AADSM Board of Directors approved the final guideline recommendations.

Recommendations:

- We suggest that sleep physicians conduct follow-up sleep testing to improve or confirm treatment efficacy, rather than conduct follow-up without sleep testing, for [individuals] fitted with oral appliances.

**Use of Actigraphy in Adult and Pediatric [Individuals] – 2018**

The following AASM recommendations are intended as a guide for clinicians using actigraphy in evaluating [individuals] with sleep disorders and circadian rhythm sleep-wake disorders, and only apply to the use of FDA-approved devices. Each recommendation statement is assigned a strength ("Strong" or "Conditional"). A "Strong" recommendation (i.e., "We recommend…") is one that clinicians should follow under most circumstances. A "Conditional" recommendation (i.e., "We suggest…") reflects a lower degree of certainty regarding the outcome and appropriateness of the patient-care strategy for all [individuals]. The ultimate judgment regarding any specific care must be made by the treating clinician and the patient, taking into consideration the individual circumstances of the patient, available treatment options, and resources.

- Suggest clinicians use actigraphy in the assessment of pediatric [individuals] with insomnia disorder.
- Suggest clinicians use actigraphy in the assessment of adult [individuals] with circadian rhythm sleep-wake disorder. (Conditional) 4. We suggest that clinicians use actigraphy in the assessment of pediatric [individuals] with circadian rhythm sleep-wake disorder.
- Suggest clinicians use actigraphy to monitor total sleep time prior to testing with the Multiple Sleep Latency Test in adult and pediatric [individuals] with suspected central disorders of hypersomnolence.
- Recommend clinicians not use actigraphy in place of electromyography for the diagnosis of periodic limb movement disorder in adult and pediatric [individuals].

**Treatment of OSA with PAP Therapy – 2019**

Based on expert consensus from the AASM, the following good practice statements and their implementation is necessary for appropriate and effective management of [individuals] with OSA treated with positive airway pressure:

- Treatment of OSA with PAP therapy should be based on a diagnosis of OSA established using objective sleep apnea testing.
- Adequate follow-up, including troubleshooting and monitoring of objective efficacy and usage data to ensure adequate treatment and adherence, should occur following PAP therapy initiation and during treatment of OSA.

## References

Lee CH, Kang KT, Chiu SN, et al. Association of adenotonsillectomy with blood pressure among hypertensive and nonhypertensive children with obstructive sleep apnea. JAMA Otolaryngol Head Neck Surg. 2018;144(4):300-307.

Friedman M, Salapatas AM, Bonzelaar LB. Updated Friedman staging system for obstructive sleep apnea. Adv Otorhinolaryngol. 2017;80:41-48.

Gillespie MB, Soose RJ, Woodson BT, Strohl KP, Maurer JT, et al. Upper airway stimulation for obstructive sleep apnea: Patient-reported outcomes after 48 months of follow-up. Otolaryngol Head Neck Surg. 2017;156(4):765-771.

Heiser C, Maurer JT, Hofauer B, Sommer JU, Seitz A, et al. Outcomes of upper airway

stimulation for obstructive sleep apnea in a multicenter German postmarket study. Otolaryngol Head Neck Surg. 2017;156(2):378-384.

Huntley C, Chou DW, Doghramji K, Boon. Comparing upper airway stimulation to expansion sphincter pharyngoplasty: A single university experience. Ann Otol Rhinol Laryngol. 2018;127(6):379-383.

Shah J, Russell JO, Waters T, Kominsky AH, Trask D. Uvulopalatopharyngoplasty vs CN XII stimulation for treatment of obstructive sleep apnea: A single institution experience. Am J Otolaryngol. 2018;39(3):266-270.

Steffen A, Sommer JU, Hofauer B, Maurer JT, Hasselbacher K, et al. Outcome after one year of upper airway stimulation for obstructive sleep apnea in a multicenter German post-market study. Laryngoscope. 2018;128(2):509-515.

Woodson BT, Strohl KP, Soose RJ, Gillespie MB, Maurer JT, et al. Upper airway stimulation for obstructive sleep apnea: 5-year outcomes. Otolaryngol Head Neck Surg. 2018;159(1):194-202.

Hilmisson H, Berman S, Magnusdottir S. Sleep apnea diagnosis in children using softwaregenerated apnea-hypopnea index (AHI) derived from data recorded with a single photoplethysmogram sensor (PPG) : Results from the Childhood Adenotonsillectomy Study (CHAT) based on cardiopulmonary coupling analysis [published online ahead of print, 2020 Mar [28]. Sleep Breath. 2020;10.1007/s11325-020-02049-6.

Garde A, Hoppenbrouwer X, Dehkordi P, et al. Pediatric pulse oximetry based OSA screening at different thresholds of the apnea-hypopnea index with an expression of uncertainty for inconclusive classifications. Sleep Med. 2019; 60:45-52.

Venekamp RP, Hearne BJ, Chandrasekharan D, Blackshaw H, Lim J, Schilder AG. Tonsillectomy or adenotonsillectomy versus non-surgical management for obstructive sleep-disordered breathing in children. Cochrane Database Syst Rev. 2015;(10):CD011165.

Mitchell RB, Archer SM, Ishman SL, et al. Clinical Practice Guideline: Tonsillectomy in Children (Update)-Executive Summary. Otolaryngol Head Neck Surg. 2019;160(2):187-205.

Smith MT, McCrae CS, Cheung J, et al. Use of Actigraphy for the Evaluation of Sleep Disorders and Circadian Rhythm Sleep-Wake Disorders: An American Academy of Sleep Medicine Clinical Practice Guideline. J Clin Sleep Med. 2018;14(7):1231-1237.

Rosenberg R, Hirshkowitz M, Rapoport DM, Kryger M. The role of home sleep testing for evaluation of patients with excessive daytime sleepiness: Focus on obstructive sleep apnea and narcolepsy. Sleep Med. 2019; 56:80-89.

Lin CH, Chen CH, Hong SY, Chou IC, Liang SJ, Hang LW. Polysomnography is an important method for diagnosing pediatric sleep problems: Experience of one children's hospital. Children (Basel). 2021;8(11):991.

Lee J, Na G, Joo EY, Lee M, Lee J. Clinical and polysomnographic characteristics of excessive daytime sleepiness in children. Sleep Breath. 2017;21(4):967-974.

**POLICY UPDATE HISTORY**

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|---|---|
| 09/20/2021 | Approved in Medical Policy Committee |

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| 05/02/2022 | Annual review, approved in Medical Policy Committee |
| 05/24/2022 | Approved in QI/UM |
| 03/22/2023 | Annual review; approved in Medical Policy Committee |
| 03/28/2023 | Approved in QI/UM |