

# Policy on Obstructive Sleep Apnea

## Originating Council

Council on Clinical Affairs

## Adopted

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### Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that obstructive sleep apnea (OSA) occurs in the pediatric population. Undiagnosed and/or untreated OSA is associated with cardiovascular complications, impaired growth (including failure to thrive), learning problems, and/or behavioral problems. In order to reduce such complications, AAPD encourages healthcare professionals to routinely screen their patients for increased risk for OSA and to facilitate medical referral when indicated.

### Methods

This policy is based on a review of current dental and medical literature pertaining to obstructive sleep apnea including an electronic literature search with PubMed® using the terms: sleep apnea and dentistry, obstructive sleep apnea and dentistry, obstructive sleep apnea and attention-deficit hyperactivity disorder (ADHD), sleep disordered breathing; fields: all; limits: within the last ten years, humans, all children zero to 18 years, English, clinical trials, and literature reviews. The search returned 36 articles. The reviewers agreed upon the inclusion of 15 articles that met the defined criteria. When data did not appear sufficient or were inconclusive, policies were based upon expert and/or consensus opinion by experience researchers and clinicians.

### Background

Pediatric OSA is a disorder of breathing characterized by prolonged, partial upper airway obstruction and or intermittent/complete obstruction (obstructive apnea) that disrupts normal ventilation during sleep and normal sleep patterns.<sup>1</sup> OSA affects approximately 18 million people in the United States and is a common form of sleep-disordered breathing. The condition exists in one to five percent of children and can occur at any age, but may be most common in children ages two to seven.<sup>2</sup> Adult criteria for OSA may be used for patients aged 13-18 years.<sup>3</sup> Early diagnosis and treatment of OSA may decrease morbidity. However, diagnosis frequently is delayed.<sup>1</sup>

Obstructive sleep apnea occurs when the muscles in the back of the throat relax, causing the airway to narrow on inspiration. This, in turn, may lower the oxygen level in the blood. This decreased oxygen is sensed by the brain, which then wakes the individual to facilitate breathing. This disruption in breathing may occur multiple times per hour all night long.<sup>1</sup>

Ultimately, these cycles of awakening prohibit the apneic person from reaching deep, restful sleep. For this reason, children with untreated OSA may be inappropriately diagnosed as having ADHD.<sup>2</sup>

OSA differs from central sleep apnea. Central sleep apnea (CSA) is less common and occurs when the brain fails to transmit signals to the muscles of respiration.<sup>4</sup> The most common cause of CSA is congestive heart failure or stroke, high altitude, and medication use; however, premature infants also may be predisposed to CSA.<sup>3</sup>

### Symptoms of OSA include:<sup>1</sup>

- Excessive daytime sleepiness.
- Loud snoring three or more nights per week.
- Episodes of breathing cessation witnessed by another person.
- Abrupt awakenings accompanied by shortness of breath.
- Awakening with dry mouth or sore throat.
- Morning headache.
- Difficulty staying asleep.
- Attention problems.
- Mouth breathing.
- Sweating.
- Restlessness.
- Waking up a lot.

Signs of untreated sleep apnea in school-aged children may include bed wetting and poor school performance due to misdiagnosed ADHD, aggressive behavior, or developmental delay.<sup>1</sup> Rare sequelae of untreated OSA include brain damage, seizures, coma, and cardiac complications.<sup>1-3</sup> These children also may experience impaired growth.<sup>1,2</sup>

### Etiology of OSA

Patients with certain anatomic anomalies, craniofacial anomalies, neuromuscular diseases, or Down syndrome are at increased risk for development of obstructive sleep apnea.<sup>5</sup> Anatomic anomalies may include hypertrophic tonsils and adenoids, choanal atresia, respiratory tissue thickening (e.g., caused by disease such as polysaccharidosis, achondroplasia), or obesity.<sup>2</sup> Neuromuscular disorders with a component of hypotonia (e.g., cerebral palsy, myotonic dystrophies, other myopathies) predispose children to OSA.<sup>1</sup> Additionally, infants with gastroesophageal reflux disease may be at risk for OSA

due to upper airway edema or laryngospasm. Exposure to environmental tobacco smoke also has been associated with OSA.<sup>3</sup>

Midface deficiency, with or without micrognathia, may predispose some children with craniofacial abnormalities to development of OSA.<sup>1,2</sup> Certain surgical procedures (e.g., pharyngeal flaps to correct velopharyngeal insufficiency) in these patients also may contribute to OSA.<sup>3</sup>

### Diagnosis of OSA

Pediatric dentists are in a unique position to be able to identify patients at greatest risk. Adenotonsillar hypertrophy<sup>6</sup> and obesity are major risk factors for OSA in otherwise healthy children. With a history and careful clinical examination at each dental visit, pediatric dentists may identify signs and symptoms that may raise a concern for OSA. Assessment of tonsillar hypertrophy<sup>6</sup> and percentage of airway obstruction by the Friedman Tongue Classification system<sup>7</sup> may be done as part of the routine intraoral examination.

Multiple screening tools are available for adult sleep apnea (e.g., STOP-BANG questionnaire<sup>8</sup>, Kushida Index<sup>9</sup>). However, inclusion of sleep questions on the health history form may further help identify patients at risk. Such questions might include:

- Does your child snore loudly when sleeping?
- Does your child have trouble breathing while sleeping?
- Does your child stop breathing during sleep?
- Does your child occasionally wet the bed at night?
- Is your child hard to wake up in the morning?
- Does your child complain of headaches in the morning?
- Does your child tend to breathe through his/her mouth during the day?
- Have you or the teacher commented your child appears sleepy during the day?
- Does your child fall asleep quickly?

If a patient is suspected of being at risk for OSA, a referral to the appropriate medical doctors (e.g., otolaryngologist, pulmonologist, sleep medicine physician) is advised. Then, a clinical examination in addition to polysomnography (sleep study) will either confirm or deny the diagnosis.<sup>10</sup> The American Academy of Pediatrics recommends polysomnography be performed in children/adolescents with snoring and signs/symptoms of OSA.<sup>1</sup> A positive diagnosis of OSA likely will be made by a sleep physician in the presence of signs/symptoms concurrent with at least one predominantly obstructive respiratory event, mixed apnea, or hypopnea per hour of sleep or a pattern of obstructive hypoventilation with hypercapnia for at least 25 percent of total sleep time during the polysomnography.<sup>3</sup>

### Treatment of OSA

Treatment for OSA may be accomplished with either non-surgical or surgical options, depending on its severity and etiology. Non-surgical options include treatment of nasal

allergies<sup>1</sup>, continuous positive airway pressure (CPAP), weight reduction, and changes in sleep hygiene. Previously, three types of oral appliances commonly were used for treatment of sleep-related breathing: mandibular advancing devices, tongue retaining devices, and palatal lift appliances.<sup>11</sup> Although some studies have advocated the use of non-surgical interventions such as rapid maxillary/palatal expansion (RPE) or a modified monobloc appliance,<sup>2,12</sup> these studies had small sample sizes.<sup>12</sup> As functional intraoral appliances alter the position and/or growth of the maxilla or mandible, a complete orthodontic assessment including records should be completed. It is advised that the dentist work with the physician to determine if adjunctive options (e.g., RPE, orthodontic treatment) are advised as part of a multidisciplinary treatment effort. If a dentist decides to treat OSA with an intraoral appliance, it is strongly encouraged that the patient be reassessed throughout treatment for symptoms of OSA to determine if the treatment is working.<sup>1</sup>

The most common surgical option for treatment of OSA is adenotonsillectomy.<sup>14</sup> Other surgical options include uvulopalatopharyngoplasty, ablation, revision of previous posterior pharyngeal flap surgery, distraction osteogenesis, or tracheostomy.<sup>2</sup>

### Complications of untreated OSA

In addition to the comorbidities listed previously (i.e., cardiovascular problems, impaired growth, learning problems, behavioral problems), untreated OSA in combination with insulin resistance and obesity in a child sets the stage for heart disease and endocrinopathies.

Pediatric dentists who perform sedation and surgical procedures in patients with OSA should be aware that these patients are more likely to experience perioperative and post-operative breathing complications.<sup>15</sup>

### Policy statement

The AAPD recognizes that there may be consequences of untreated OSA. Therefore, the AAPD encourages health care professionals to:

- Screen patients for snoring and sleep-related breathing disorders.
- Screen patient for OSA.
- Assess the tonsillar pillar area for hypertrophy.
- Assess tongue positioning as it may contribute to obstruction.
- Recognize obesity may contribute to OSA.
- Refer to an appropriate medical provider (e.g., otolaryngologist, sleep medicine physician, pulmonologist) for diagnosis and treatment of any patient suspected of having OSA.
- Consider non-surgical intraoral appliances only after a complete orthodontic/craniofacial assessment of the patient's growth and development as part of a multidisciplinary approach.

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