

# Treatment for Obstructive Sleep Apnea in Pediatric Population

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## DESCRIPTION

Obstructive Sleep Apnea (OSA) affects about 1%-5% of the pediatric population. Results of untreated OSA in children include neurocognitive impairment, behavioral problems, poor school performance, systemic and pulmonary hypertension. There are many treatment options for pediatric OSA, including a variety of surgical and non-surgical procedures. Factors that contribute to the pathophysiology of pediatric OSA include obesity, adenotonsillar hypertrophy, and neuromotor tone dysfunction. Children at high risk for OSA include children with hereditary disorders such as Down's syndrome, craniofacial abnormalities, and neuromuscular disorders. Children with OSA often complain of snoring and dyspnea during sleep, as well as symptoms of daytime hyperactivity and excessive daytime sleepiness. Consequences of OSA in children include neurocognitive problems, behavioral problems, poor academic performance, and cardiovascular risk. As a result, untreated OSA can pose a significant medical burden. The diagnosis of OSA is made by the night time Polysomnography (PSG) performed in the sleep laboratory. The severity of OSA is based on the classification of obstructive Apnea and Hypopnea Index (AHI) derived from PSG. Most centres classify pediatric OSA as mild if AHI is 1-5 events per hour, moderate if AHI is 5-10 events or less per hour, and severe if AHI is above 10 events per hour.

Adenotonsillectomy is the best treatment for children with OSA, with a success rate of up to 80%. However, after surgery, residual OSA can occur in children, especially those with underlying comorbidity (Down's syndrome, obesity, etc.). In addition, some children in other high-risk populations, such as infants with neuromuscular disease and craniofacial abnormalities such as the Pierre Robin sequence, are not considered for adenotonsillectomy. Pediatric OSA alternative treatment options include both surgical and non-surgical interventions. Adenotonsillectomy is the first-line treatment for pediatric OSA. Adenotonsillar hypertrophy is a known risk factor for developing OSA in the pediatric population. Removing the tonsils and adenoids increases the size of the upper airways and makes them less prone to collapse. Adenotonsillectomy is an effective treatment for pediatric OSA, but it is not without risk. The most common postoperative complication is airway obstruction, which manifests itself as overnight persistent desaturation that may require oxygenation. This occurs about 9.4% of cases with

the time resolved during the recovery period. Primary hemorrhage (occurs within 24 hours of surgery) and secondary hemorrhage (occurs 24 hours after surgery) occur at a rate of 2.4% and 2.6%, respectively. Other complications include postoperative pain and dehydration due to inadequate fluid intake. The risk of death is 1 in 16,000 to 35,000. Identifiable risk factors for postoperative complications include children less than 3 years of age, severe OSA, cardiac complications, growth disorders, obesity, craniofacial abnormalities, neuromuscular disease, and associated respiratory infections.

Adenotonsillectomy is central to the treatment of pediatric OSA, but OSA can persist in high-risk populations. Non-invasive Positive Airway Pressure (PAP) is an effective treatment for children with residual OSA or for whom Adenotonsillectomy is not an option. This remedy involves the use of a machine that produces positive air pressure connected to an interface such as a nasal mask. Delivery of PAP to the upper respiratory tract relieves obstruction during sleep.

Commonly used PAP modes for children are Continuous Positive Airway Pressure (CPAP) and Bi-level Positive Airway Pressure (BPAP). Recently, a mode of CPAP called Automatic Positive Airway Pressure (AutoPAP) has been prescribed more and more frequently, especially in older children. The AutoPAP device features the ability to actively monitor the patient's breathing through proprietary software that provides feedback to the device to adjust the pressure setting to provide just enough pressure to overcome the apnea.

## CONCLUSION

Side effects of CPAP therapy include stuffy nose, recurrent nosebleeds, and dry mouth. Due to the new mask design and materials, pressure ulcers and skin damage are less common, but pressure can cause infants to develop hypoplasia of the central face, especially if they are wearing PAP for extended periods of time. Although CPAP has been shown to be effective in treating OSA, adherence to treatment remains a major barrier to its use.

Non-surgical treatments and medications are available if the pediatric OSA does not respond to surgery or if the patient is not safe for surgery due to comorbidities. These options are becoming increasingly accepted and safe, especially in children with mild to moderate OSA.

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