

Pediatric Sleep Disordered Breathing/Obstructive Sleep Apnea

OVERVIEW OF SLEEP DISORDERED BREATHING

Sleep-disordered breathing (SDB) is a general term for breathing difficulties occurring during sleep. SDB can range from frequent loud snoring to Obstructive Sleep Apnea (OSA) a condition involving repeated episodes of partial or complete blockage of the airway during sleep. When a child's breathing is disrupted during sleep, the body perceives this as a choking phenomenon. The heart rate slows, blood pressure rises, the brain is aroused, and sleep is disrupted. Oxygen levels in the blood can also drop.

Approximately 10 percent of children snore regularly and about 2-4 % of the pediatric population has OSA. Recent studies indicate that mild SDB or snoring may cause many of the same problems as OSA in children.

COULD MY CHILD HAVE OBSTRUCTIVE SLEEP APNEA?

The most obvious symptom of sleep disordered breathing is loud snoring that is present on most nights. The snoring can be interrupted by complete blockage of breathing with gasping and snorting noises and associated with awakenings from sleep. Due to a lack of good quality sleep, a child with sleep disordered breathing may be irritable, sleepy during the day, or have difficulty concentrating in school. Busy or hyperactive behavior may also be observed. Bed-wetting is also frequently seen in children with sleep apnea.

A common physical cause of airway narrowing contributing to SDB is enlarged tonsils and adenoids. Overweight children are at increased risk for SDB because fat deposits around the neck and throat can also narrow the airway. Children with abnormalities involving the lower jaw or tongue or neuromuscular deficits such as cerebral palsy have a higher risk of developing sleep disordered breathing.

Potential consequences of untreated pediatric sleep disordered breathing

- **Social:** Loud snoring can become a significant social problem if a child shares a room with siblings or at sleepovers and summer camp.
- **Behavior and learning:** Children with SDB may become moody, inattentive, and disruptive both at home and at school. Sleep disordered breathing can also be a contributing factor to attention deficit disorders in some children.
- **Enuresis:** SDB can cause increased nighttime urine production, which may lead to bedwetting.
- **Growth:** Children with SDB may not produce enough growth hormone, resulting in abnormally slow growth and development.

- **Obesity:** SDB may cause the body to have increased resistance to insulin or daytime fatigue with decreases in physical activity. These factors can contribute to obesity.
- **Cardiovascular:** OSA can be associated with an increased risk of high blood pressure or other heart and lung problems.

HOW IS SLEEP APNEA DIAGNOSED?

Sleep disordered breathing in children should be considered if frequent loud snoring, gasping, snorting, and thrashing in bed or unexplained bedwetting is observed. Behavioral symptoms can include changes in mood, misbehavior, and poor school performance. Not every child with academic or behavioral issues will have SDB, but if a child snores loudly on a regular basis and is experiencing mood, behavior, or school performance problems, sleep disordered breathing should be considered. If you notice that your child has any of those symptoms, have them checked by an otolaryngologist (ear, nose and throat doctor). Sometimes physicians will make a diagnosis of sleep disordered breathing based on history and physical examination. In other cases, such as in children suspected of having severe OSA due to craniofacial syndromes, morbid obesity, or neuromuscular disorders or for children less than 3 years of age, additional testing such as a sleep test may be recommended.

The sleep study or polysomnography (PSG) is an objective test for sleep disordered breathing. Wires are attached to the head and body to monitor brain waves, muscle tension, eye movement, breathing, and the level of oxygen in the blood. The test is not painful and is generally performed in a sleep laboratory or hospital. Sleep tests can occasionally produce inaccurate results, especially in children. Borderline or normal sleep test results may still result in a diagnosis of SDB based on parental observations and clinical evaluation.

TREATMENT FOR SLEEP DISORDERED BREATHING

Enlarged tonsils and adenoids are a common cause for SDB. Surgical removal of the tonsils and adenoids (T&A) is generally considered the first line treatment for pediatric sleep disordered breathing if the symptoms are significant and the tonsils and adenoids are enlarged. Of the over 500,000 pediatric T&A procedures performed in the U.S. each year, the majority are currently being done to treat sleep disordered breathing. Many children with sleep apnea show both short and long-term improvement in their sleep and behavior after T&A.

Not every child with snoring should undergo T&A as the procedure does have risks. Potential problems can include anesthesia or airway complications, bleeding, infection and problems with speech and swallowing. If the SDB symptoms are mild or intermittent, academic performance and behavior is not an issue, the tonsils are small, or the child is near puberty (tonsils and adenoids often shrink at puberty), it may be recommended that a child with SDB be watched conservatively and treated surgically only if symptoms worsen.

Recent studies have shown that some children have persistent sleep disordered breathing after T & A. A post-operative PSG may be necessary after surgical intervention, especially in children with persistent symptoms or increased risk factors for persistent apnea after T&A such as obesity, craniofacial anomalies or neuromuscular problems. Additional treatments such as weight

loss, the use of Continuous Positive Airway Pressure (CPAP) or additional surgical procedures may sometimes be required.