

University of Texas - Pediatric Sleep Team



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The University of Texas – Pediatric Sleep Team aims to provide the highest level of comprehensive care for children with sleep disordered breathing. All the physicians in the team are well known at the regional and national level for their expertise in the treatment of such children. We are a center for the initial evaluation of newer techniques and instruments used in the treatment of pediatric sleep apnea. The main goal of the Pediatric Sleep Team is to provide safe and effective care for children with sleep disordered breathing. The multi-disciplinary nature of the team along with the ongoing research and state of the art surgical techniques used by our surgeons to treat this disorder ensures that this goal will be met.

Drs. Poole and Pereira have co-authored a chapter on Pediatric Sleep Apnea in Bailey’s textbook of Otolaryngology, which is one of the most respected books in the specialty. In addition, they have presented their research at several national meetings. Drs. Pereira and Poole have a special interest in sleep apnea in very young children, especially those below three years of age. Dr. Kevin Pereira serves on the Tonsils and Adenoids Subcommittee of the American Academy of Otolaryngology-Head and Neck Surgery. Drs. Poole and Pereira perform tonsillectomies and adenoidectomies using a variety of techniques including the most recent *powered intracapsular microdebrider procedure*. This has been shown to significantly reduce postoperative pain and facilitate an early return to normal diet and activity while successfully alleviating the symptoms of sleep apnea.



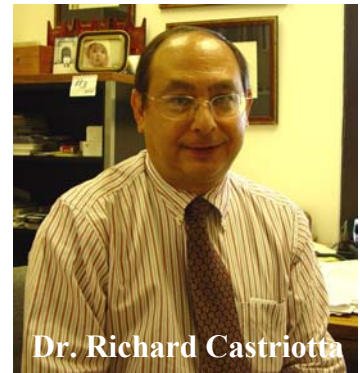
Drs. Kevin Pereira and John Teichgraeber

The pediatric sleep team has the capabilities to diagnose and treat complex craniofacial and orthodontic problems that frequently are a component of, or the cause of sleep apnea in children. Drs. Teichgraeber and Gateno are surgeons who deal with a wide variety of congenital and acquired anomalies of the craniofacial skeleton on a regular basis. They assist in the management of children with sleep apnea in whom advanced orthognathic or maxillofacial surgery may be required to reverse the adverse effects of the disorder.



Children with chronic lung and reactive airway disease complicating sleep apnea can avail themselves of the services of Dr. Okan Eledimir, our Pediatric Pulmonologist who plays an active role in the evaluation of all patients who have a pulmonary component to their upper airway obstruction. In those undergoing surgery Dr. Eledimir participates in the preoperative workup and management of such children and also takes care of their postoperative pulmonary requirements when required.

Dr. Richard Castriotta is the director of the sleep laboratory at the Memorial Hermann and Children's Hospital and a well-known researcher in pediatric sleep disordered breathing. He personally reviews all pediatric sleep studies and recommends management plans to the rest of the team. He participates in all research by the team and provides valuable insight into the complexities of interpretation of sleep studies in children.



Dr. Richard Castriotta



Dr. Peter Sczmuk is one of our Pediatric Anesthesiologists and part of the pediatric sleep apnea team. He is responsible for recommending anesthetic techniques and immediate postoperative care for children with sleep apnea. He has vast experience in the anesthetic management of neonates and infants with various complex problems and extrapolates these skills to the requirements of children with sleep apnea.

Textbook Chapter

Poole MD, Pereira KD. Obstructive sleep apnea in children. In: Byron J. Bailey (Ed.). Otolaryngology - Head & Neck Surgery. 3rd Edition. Lippincott, Williams & Wilkins. 1992

Abstracts

Al-Himyary A, Pereira KD, Poole MD, Castriotta RJ. Hyperactivity in children with obstructive sleep apnea. Southern Sleep Society Meeting. Bethesda, MD, April 2002

Al-Himyary A, Pereira KD, Khedr M, Poole MD, Castriotta RJ. High risk of obstructive sleep apnea in children with adenotonsillar hypertrophy. Am J Respir Crit Care Med, 2003; 167: A409

Pereira KD, Elkins TP, Ramakrishnan JB, Castriotta RJ, Mitchell RB. Pediatric sleep apnea-can sleep studies predict adverse outcomes after adenotonsillectomy? 2003 Annual Meeting AAO-HNS, Orlando

Current Research

Kevin D. Pereira, M.D., Jeremy C. Roebuck, M.D., Lori K. Howell. Does position during REM sleep affect polysomnography in children with adenotonsillar hypertrophy?

Kevin D. Pereira, M.D., Tina P. Elkins, M.D. The prevalence of Epstein Barr virus infection in pre-school children with Polysomnography documented Obstructive Sleep Apnea.

Sleep Disordered Breathing in Children (SDB)

[Information provided by Kevin D. Pereira, M.D., and Michael D. Poole, M.D.]

- ▲ Prevalence : Between one and eleven percent.
- ▲ Simple snoring is more common than sleep apnea and thought to be without any adverse effects.
- ▲ Majority of the children with snoring do not have sleep apnea
- ▲ African Americans are more prone to this condition when compared to Caucasians.
- ▲ Sleep disordered breathing in children includes:
 1. Obstructive sleep apnea (OSA)
 2. Upper airway resistance syndrome (UARS)
 3. Primary snoring

What is the cause?

Obstructive sleep apnea in children is usually due to swelling of the tonsils and adenoids. The volume of this tissue in the upper airway increases from around six months of age up to puberty, with the maximum proliferation occurring in the preschool years. This age coincides with the peak incidence of OSA in children.

Obesity as a cause of OSA is increasing in frequency, especially in school age children. Abnormal craniofacial developments such as Pierre Robin sequence, Treacher Collin's, Apert's and Crouzon's syndromes and neuromuscular abnormalities such as cerebral palsy and anoxic encephalopathy have a much higher incidence of severe OSA. Children with allergies are more likely to have habitual snoring. The swelling of the nasal mucosa along with increased secretions causes airway obstruction during sleep.

What happens in obstructive sleep apnea?

There is cyclical upper airway obstruction causing hypoxia (lowering of oxygen saturation in blood) and hypercapnea (retention of carbon dioxide). This usually occurs during deeper levels of sleep and results in an arousal causing fragmentation and disruption of normal sleep.

What are the possible adverse effects of OSAS?

- ▲ Mouth breathing and hyponasal speech with articulatory errors
- ▲ Decreased school performance in children.
- ▲ Hyperactivity, attention deficit, aggression and other behavioral disorders
- ▲ Higher blood pressures
- ▲ Nocturnal enuresis (bedwetting)
- ▲ Failure to thrive due to a combination of poor appetite, impaired growth hormone secretion and/or increased work of breathing
- ▲ Severe cases may progress to cardiopulmonary dysfunction.

What tests are available and do they have to be done?

Sleep studies remain the gold standard for the diagnosis of OSA in adults and children. However, a good history and physical examination by a skilled clinician can identify most cases of sleep apnea in children. Sleep studies are generally used in very young children and when in doubt about the diagnosis.

Overnight PSG can be performed at home or in the sleep laboratory. Daytime “nap studies” and nighttime pulse oximetry have fair positive predictive value, but cannot exclude the presence of significant sleep apnea.

Audio and/or video recordings and their analyses may be able to confirm severe sleep apnea but cannot differentiate mild OSA from primary snoring. Soft tissue radiographs of the nasopharynx have limited use in assessing adenoid enlargement when compared to flexible endoscopy.

What values would be considered abnormal in a pediatric sleep study?

- ▲ Apnea index of >1
- ▲ Oxygen desaturation of >4% more than three times an hour or associated with a >25% change in heart rate
- ▲ Oxygen desaturation <92%
- ▲ Elevation of end-tidal CO₂ to >50mm/hg for >8% of total sleep time or 45mm/hg for >60% of sleep time

What is the treatment?

Medical therapy with nasal steroids may help some, especially those with allergies. Adenotonsillectomy remains the mainstay of treatment for pediatric obstructive sleep apnea. Sometimes an adenoidectomy alone or a tonsillectomy alone may help relieve obstruction.



At what age is it safe to perform these procedures?

No age is a contraindication for surgery if the conditions that require it exist. The usual age at which a tonsillectomy and adenoidectomy is performed is between 4 and 7 years. Surgery in very young children should preferably be performed in an institution that has facilities for pediatric intensive care.

Should children be monitored in hospital overnight after a tonsillectomy for sleep apnea?

Most can go home if they meet hospital discharge criteria. Very young children and those considered as being in the high risk category (your doctor will tell you) are usually observed overnight

What are the common complications of this procedure?

- ▲ Airway obstruction due to swelling of the tissues or excessive drowsiness
- ▲ Dehydration especially in young children
- ▲ Bleeding – early and delayed
- ▲ Change in voice
- ▲ Nasal regurgitation