Treatment

- Tonsillectomy and Adenoidectomy:
  - Most common treatment.
  - Adenoidectomy alone may not be sufficient.
  - Both symptom and polysomnographic resolution occurs in 75-100% of children. (average is 87.5 percent success in children with large tonsils and moderate to sever apnea)
  - It is effective even in obese children.

Nieminen P et al Acta otolaryngol Suppl 1997;529:190-194.

Zucconi M et al Int J pediatr Otorhinolaryngol 1993;26:235-243.

Kudoh F et al Acta Otolaryngol 1996;523(suppl):216-218.

Risk factors for adenotonsillectomy

- Age younger than 3 years.
- Severe OSA on PSG.
- Cardiac complications: Cor pulmonale. Bleeding disorders
- Failure to thrive.
- Obesity.
- Prematurity.
- Recent respiratory infection.
- Craniofacial anomalies.
- Neuromuscular abnormalities.
  - *McColley SA et al Arch Otolaryngol Head Neck Surg 1992;118:940-943.*
  - *Biavati MJ et al Arch Otolaryngol Head Neck Surg 1997;123:517-521.*
  - *Rosen GM et al Pediatrics 1994;93:784-788.*

Tonsillectomy and Adenoidectomy

- Potential complications:
  - Anesthetic complications
  - Post operative problems such as pain and poor oral intake.
  - Respiratory complications such as worsening of OSA and pulmonary edema.
  - High risk patients should be hospitalized overnight and monitored by continuous pulse oximetry.

Continuous Positive Airway Pressure.

- An option for:
  - Patients with specific surgical contra indications.
  - Minimal adenotonsillar tissue.
  - Persistent OSAS after adenotonsillectomy.
  - Patients who do not want to undergo surgery.

Marcus CL et al J Pediatr 1995;127:88-94.

Waters KA et al Am J Respir Crit Care Med 1995;152:780-785.

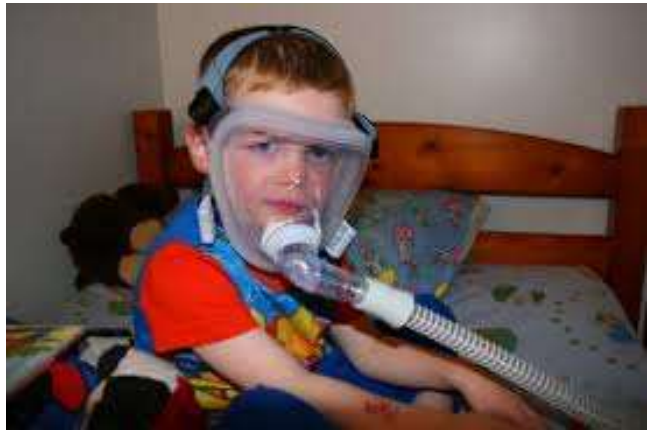
Guilleminault C et al J Pediatr 1995;127:905-912

Continuous Positive Airway Pressure

- It will need to be used indefinitely to start.
- CPAP must be titrated in the sleep laboratory before being prescribed.
- Better tolerated in older children rather than younger.
- Younger children may require behavioral therapy.
- Mask Fitting is Key.
- Adherence is key.
- Prescribing physicians need to pay close attention to compliance.

  Rains JC et al Clin Pediatr (Phila) 1995;34:535-541

Treatment



Watchful Waiting

- **Watchful waiting for up to six months** – For otherwise healthy children with mild or moderate OSA confirmed by PSG (AHI >1 and <10), watchful waiting with supportive care is a reasonable alternative to adenotonsillectomy.
- Supportive care may include conservative medical management, with treatment or referral for treatment of comorbidities such as asthma, allergic rhinitis, education regarding sleep hygiene and healthy sleep behaviors, and the use of nasal saline spray as needed for nasal mucosal dryness or crusting. Weightloss, This approach is based on the acceptable outcomes for patients followed with watchful waiting in the Childhood Adenotonsillectomy Trial (CHAT)

Watchful Waiting

- However It should be noted adenotonsillectomy compared to watchful waiting in the CHAT study led to improved daytime behavior, sleep apnea symptoms, subjunctive sleepiness and quality of life.
- If watchful waiting is chosen it needs to be re-evaluated with in 6 months

Other Therapies

- Effectiveness of Adjunctive Therapies have not been prospectively evaluated.
- Avoidance of environmental tobacco smoke
- Avoidance of indoor allergens
- Treatment of accompanying allergic rhinitis.
- Weight loss for obese patients.
- Specific therapy should not be delayed while these therapies are tried.

- **Rapid maxillary expansion** – Prepubertal children with OSA and a narrow palate (crossbite) and little adenotonsillar tissue are candidates for treatment with rapid maxillary expansion (RME). RME is an orthodontic technique that widens the palate and nasal passages, thereby increasing airway patency. Such patients should be managed by an orthodontist experienced with pediatric sleep-related respiratory abnormalities.
- ●**Corticosteroids or antiinflammatory therapy** – For children with mild or moderate OSA and nasal obstruction due to adenoidal hypertrophy/allergic rhinitis, a trial of intranasal corticosteroids or leukotriene modifier therapy may be performed for two to four weeks, prior to determining whether the therapy should be continued long-term as an adjunct or alternative to adenotonsillectomy or positive airway pressure.
- ●**Other therapies** – Selected children with OSA may derive benefit from adjunctive therapies. As examples, obese children with OSA may benefit from weight loss, and all children may benefit from avoidance of environmental allergens or irritants such as tobacco smoke. In addition, positional therapy (eg, elevation of the head of the bed) can be considered

Other Therapies

- Oxygen Therapy:

  Does not prevent sleep related upper airway obstruction.

  May worsen hypoventilation by decreasing the hypoxemic dive to breathe.

  Should be carefully titrated in the pediatric sleep laboratory, with PCO_2 monitoring.

Surgical Therapies:

  Uvulopharyngopalatoplasty, craniofacial surgery, tracheostomy.

  Marcus CL et al Am J Respir Crit Care Med 1995;152:1297-1301.

Follow up

- All patients should have clinical follow up for reassessment of the signs and symptoms of OSA after initial therapy.
- Patients with continued symptoms or signs should be revaluated with another PSG.
- The PSG can be repeated 12 weeks after T/A surgery for re evaluation.

Suen JS et al Arch Otolaryngol Head Neck Surg 1995;121:525-530.

Recommendations

- All children should be screened for snoring.
- Complex high risk patients should be referred to a specialist.
- a thorough diagnostic evaluation. History/ physical, Nocturnal PSG remains the best method to evaluate the severity of the disorder and guide recommendations.
- Adenotonsillectomy is the first line of treatment for most children. CPAP is a useful option.
- High risk patients should be monitored as in- patients post operatively.
- All patients should be re evaluated. High risk patients should have an objective evaluation.

Conclusion

- Sleep medicine is a relatively new field with much current research going on.
- Pediatric sleep is still a developing field
- Sleep disordered breathing may present with a variety of different symptoms and in a variety of different patients.
- An overnight PSG in a certified pediatric sleep laboratory with appropriately trained personnel is the best way to diagnose sleep problems in children.
- Pediatrician can and should look for sleep related problems in their patients.

Questions???