

PEDIATRIC OBSTRUCTIVE SLEEP APNEA: EVALUATION, DIAGNOSIS AND TREATMENT

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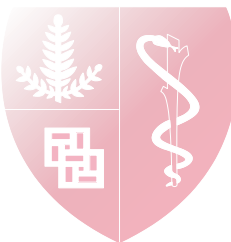


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Disclosures:

- I have no financial relationships to disclose.



Definition

- Disorder of breathing during sleep characterized by prolonged partial upper airway obstruction and/or intermittent complete obstruction that disrupts normal ventilation during sleep and normal sleep patterns

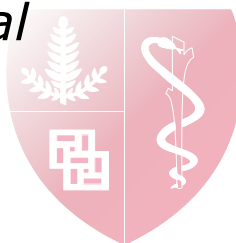
ATS Am J Respir Crit Care Med 1996;153:866-878



OSA Vs. Primary Snoring

- This is snoring without obstructive apnea, usually without frequent arousals from sleep and without gas exchange abnormalities.
- It is usually considered benign, but may be a cause for recurrent night awakenings and impaired school performance.

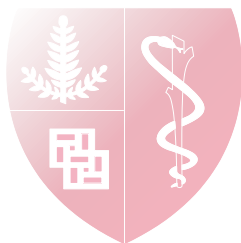
ASDA; International Classification of Sleep Disorders: Diagnostic and coding manual 1997:195-197.



Epidemiology of OSA in Children

- Childhood OSA is common
- Prevalence of 2% (1-3%) in children aged 2-18 years.
- OSA in children occurs equally in boys and girls.
- It is more common in African American children.

Redline S ,et al ,Am J Respir Crit Care Med 1999, 159:1527-1532.



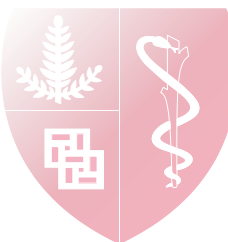
Pathophysiology

- Poorly understood.
- Most children have OSA due to adeno tonsillar hypertrophy with improvement after surgical removal.
- Underlying abnormalities of upper airway function, weight/ size, lounge, mallampati score and impaired neuromotor/ nueromuscular tone also play a role.
- There is a generalized deficit in arousal to both increased airway resistance and hypercapnia.

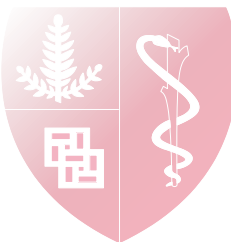
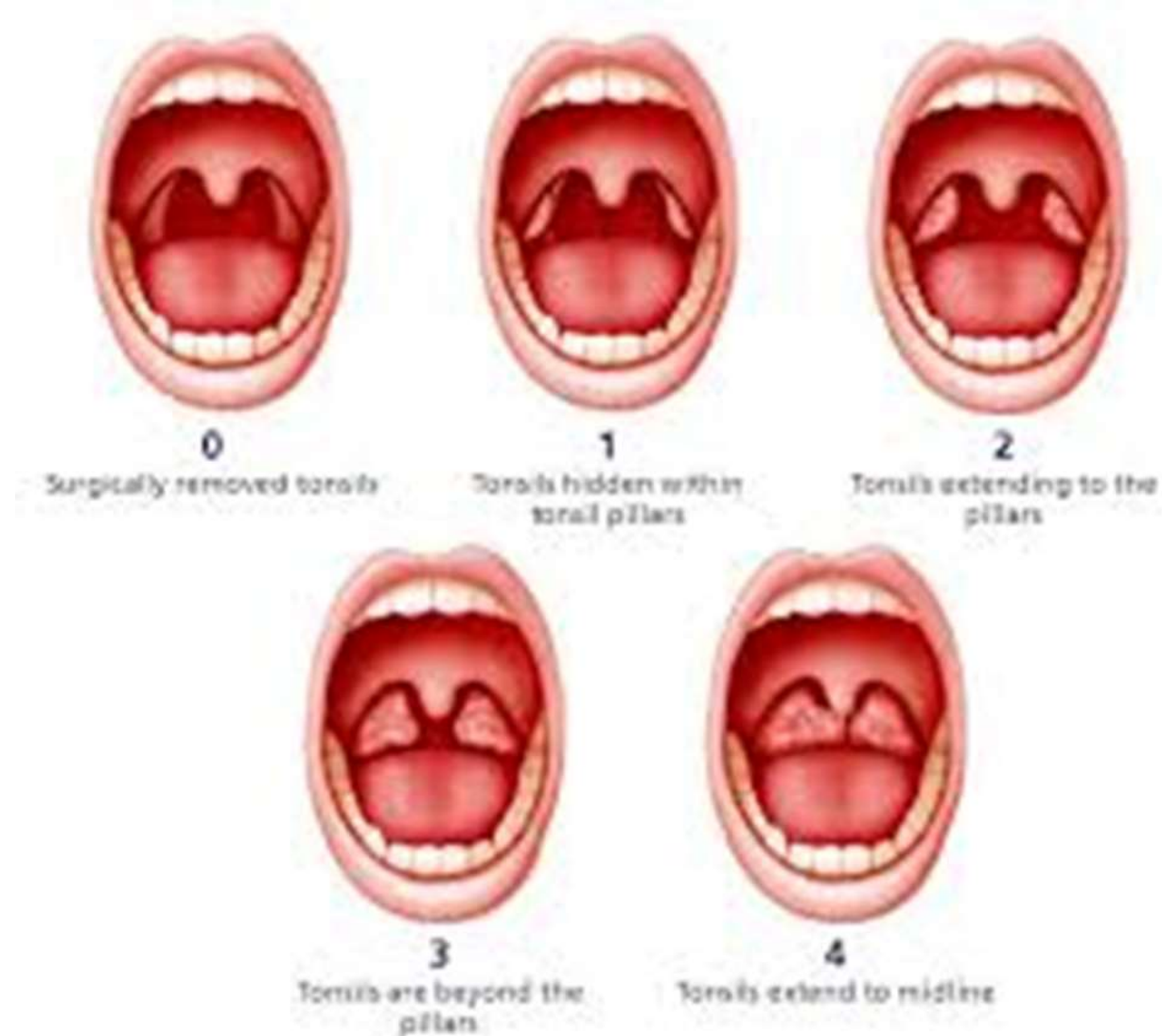
Guillemenault C, et al, J Pediatr 1989,114:997-999

Marcus CL et al J Appl Physiol 1998, 84:1926-36.

Marcus CL , et al J Appl Physiol 1999,87:1448-1454.



Airway: Tonsillar Hypertrophy



Airway: Mallampati

The Mallampati Score



CLASS I
Complete
visualization of
the soft palate



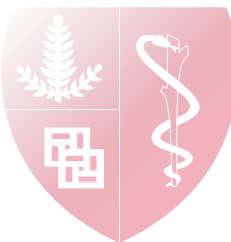
CLASS II
Complete
visualization
of the uvula



CLASS III
Visualization
of only the
base of the uvula



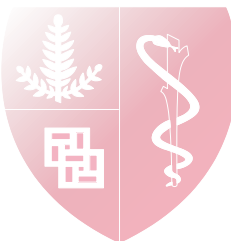
CLASS IV
Soft palate
is not
visible at all



Children Vs. Adult OSA

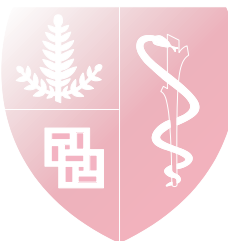
- Pre Schoolers
 - Sex ratio is equal
 - Etiology: Adenotonsillar hypertrophy
 - Weight: Failure to thrive, normal, obese.
 - Excessive daytime somnolence: uncommon
 - Neuro behavioral: Hyperactivity, developmental delay.
- Middle aged
 - More in males, postmenopausal females.
 - Obesity
 - Obese
 - Common

 - Cognitive impairment, impaired vigilance.



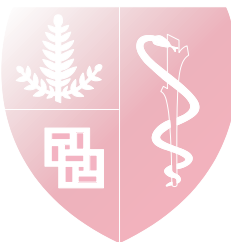
Children Vs. Adult OSA

- Polysomnography
 - Cyclic obstruction or prolonged obstructive hypoventilation.
 - Sleep architecture normal
 - Mostly in REM
 - Cortical arousal in more than 50% cases.
 - Surgically treated in the majority
- Polysomnography
 - Cyclic obstruction
 - Decreased delta and REM sleep
 - REM or non REM
 - At termination of each apnea.
 - Mostly non invasive ventilation.



Child vs. Adult OSA

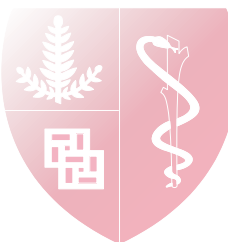
- AHI: Children
 - 0-1= normal
 - 1-5= mild
 - 5-10= moderate
 - 10 and above= severe
- AHI: Adult
 - 0-5=normal
 - 5-15= mild
 - 15-30= moderate
 - 30 and above= severe



Diagnosis: Goals

- To identify patients who are at risk of Apnea and asses outcomes.
- Chose worth while diagnostic tool
- Avoid unnecessary intervention in treatment.
- Evaluate which patients are at risk of severe complications from adenotonsillectomy

AAP Practice Guideline Pediatrics 2002; 109 (4): 704-712.



Diagnosis

- **History:**

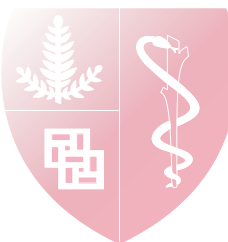
- Chronic mouth breathing, habitual snoring and restless sleep, with or without frequent awakenings
- Parents can describe retractions, paradoxical breathing, pauses in snoring, and observed apneas.
- Less frequent/ but possible: daytime sleepiness, cor pulmonale, failure to thrive
- Behavioral personality and learning disorders including attention deficit disorder and hyperactivity.
- Enuresis?
- Bruxism?

Guilleminault C, et al Lung 159:275-287

Brouillete R, et al J Pediatr 100:33-41

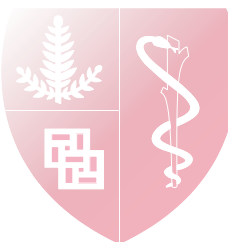
Weissbluth MA et al Behav Pediatr 4:119-121

Everett A et al Clin Pediatr 26:90-92



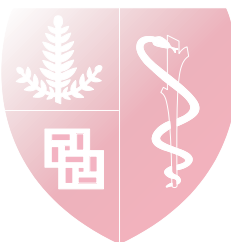
Case Report: History

- 15 year old caucasian male, K.V., referred with a chief complaint of loud continuous snoring, restless sleep , and excessive daytime somnolence for the last 1 year. "always tired"
- He also wakes up several times at night and complains of being 'short of breath". Complains of heart burn/reflux as well
- Past Medical History: exercise induced bronchospasm and recurrent epigastric pain. Von Willebrand Syndrome



Case Report: History

- Birth and Neonatal History: Non contributory.
- Family History: No history of chronic pulmonary disease or sleep disorders. Positive for Von Willebrand disease
- Social History: Occasional smoker with vape pen.



Diagnosis

- **Physical Examination:**
 - Growth abnormalities: Thin OR obese
 - Signs of nasal obstruction, adenoidal facies, enlarged tonsils
 - Increased pulmonic component of second heart sound.
 - Patient may have no abnormalities at all !!

