



# OBSTRUCTIVE SLEEP APNEA

Episodes 9.1 - 9.2

## ABNORMAL RESPIRATORY EVENTS DURING SLEEP

Abnormal respiratory patterns that result in abnormal gas exchange (hypoventilation). Problematic if repetitive

**APNEIC EVENT:** reduction in airflow by > 90% of baseline for > 90% of the event, cessation of ventilation for > 10 sec which lead to arousal

**HYPOPNEIC EVENT:** reduction in airflow by > 30% of baseline for > 90% of the event, reduced ventilation for > 10 sec which lead to arousal, >4% reduction in oxyhemoglobin

**RESPIRATORY EFFORT RELATED AROUSAL (RERA):** > 10 sec duration cycles of increasing / decreasing respiration leading to an arousal that cannot be defined as apnea or hypopnea

## MEASURED PARAMETERS



Apnea index (AI) → number of apneas / hr

Apnea / hypopnea index (AHI) → apneas + hypopneas divided by total sleep time

Respiratory disturbance index (RDI) → [(RERA + apneas + hypopneas) x 60] divided by total sleep time

## SLEEP DISORDERED BREATHING

**Upper airway resistance syndrome (UARS):** symptoms of obstruction without reduction in oxyhemoglobin. RDI < 5

**Obstructive sleep apnea syndrome (OSAS):** Repeated episodes of obstructive apneas and hypopneas from partial or complete collapse of upper airway. Followed by reduction in oxyhemoglobin (hypoxemia) and unconscious (EEG) arousal



**Obstructive sleep apnea / hypopnea syndrome (OSAHS):** OSAS + symptoms of excessive daytime fatigue, snoring, and witnessed apneas

## SNORING!

Common problem in gen. population (84%M / 73%F > 70yo). Occurs in 70 - 95% of patients with OSAHS, but is a **poor** predictor of OSAHS! Increased with weight gain, supine position, sedatives, alcohol and sleep deprivation



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## OSAHS

2-5% prevalence

40 - 60 y.o. at diagnosis

M > F prevalence, 2:1 ratio

**Associated comorbidities:**

hypertension, stroke

insulin resistance, MVAs

impaired daytime performance

decreased quality of life, independent increase in mortality

**Pathogenesis:**

**Obstructive** -- narrowing or occlusion of the upper airway during sleep from 1) abnormal anatomy, 2) insufficient reflex activation of the upper airway dilator muscles, or 3) increased collapsibility of the passive upper airway

**Central** -- brain stem failure to prompt inhalation / ventilation (eg. Parkinson's)

**Mixed** ("complex") -- prolonged obstructive with acquired central component



## EPWORTH SLEEPINESS SCALE

Helpful in distinguishing primary snorers from OSAHS

Does not correlate with severity of OSAHS

Score: < 8 normal, 13 - 17 mild, > 18 severe

## PHYSICAL EXAM

BMI, neck circumference

"Crowded airway" - retrognathia, macroglossia, redundant pharyngeal tissue, tonsillar pillar hypertrophy, raised tongue (modified Mallampati)



## DIAGNOSIS

Gold standard is polysomnography (PSG). Measures EEG, ECG, electrooculogram, oronasal pressure, video, oxyhemoglobin saturation and RDI



## TREATMENT

**Risk modification:** sleep position therapy, weight loss, and medical therapy for underlying cause of central sleep apnea  
**CPAP**

**Oral devices**

**Surgery:** AHI > 20, anatomical site of obstruction, failure of medical management, and excessive daytime sleepiness. Most commonly uvulopalatoplasty (UPPP) or tonsillectomy (pediatrics). Severe cases may require tracheostomy