

Obstructive Sleep Apnea

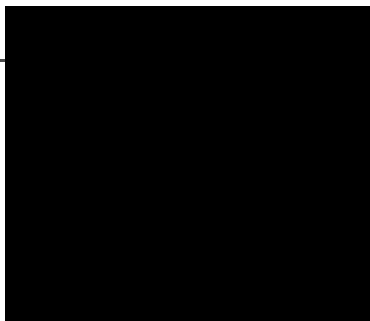
A Patient's Perspective



I'M NOT AT MY BEST
IN THE MORNING



Fran Rosenberg, RN, BN, NCA, GNC (c)

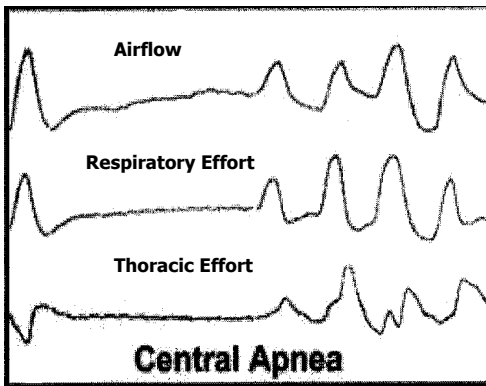


Definitions

- Apnea – Greek word – means without breath complete cessation of breath that lasts **at least** 10 seconds
- Hypopnea – Reduction in airflow and a struggle to breath
- Apnea-hypopnea index (AHI)- average number of apneas and hypopneas per hour
Mild – AHI 5-15, Moderate 15-30, Severe 30+

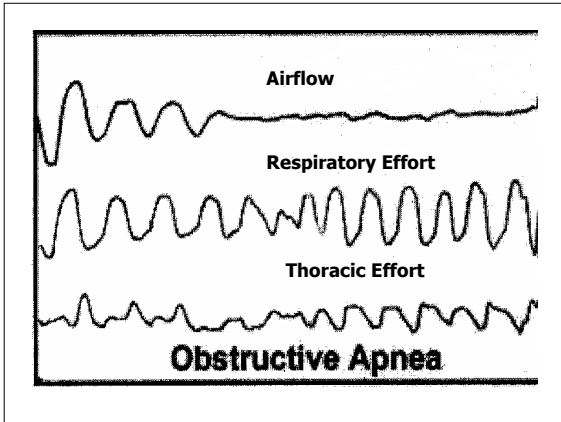
Central Sleep Apnea

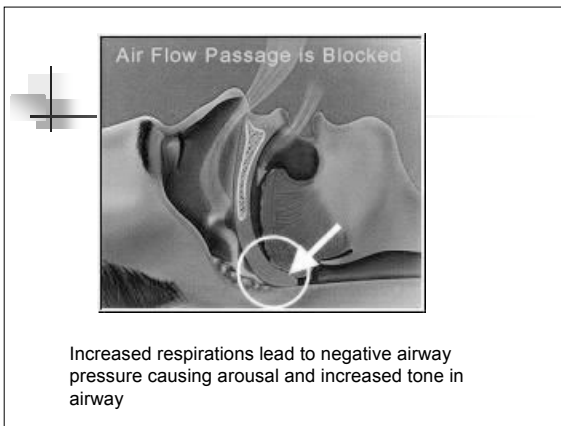
- Caused by irregularities in the brain's normal signals to breathe
- Brain stem response slowly to the increase in and removal of carbon dioxide from the blood (Cheyne-Stokes)
- **Snoring not usually an issue**

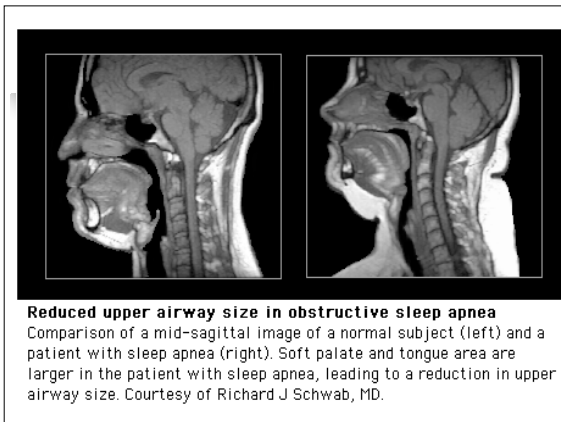


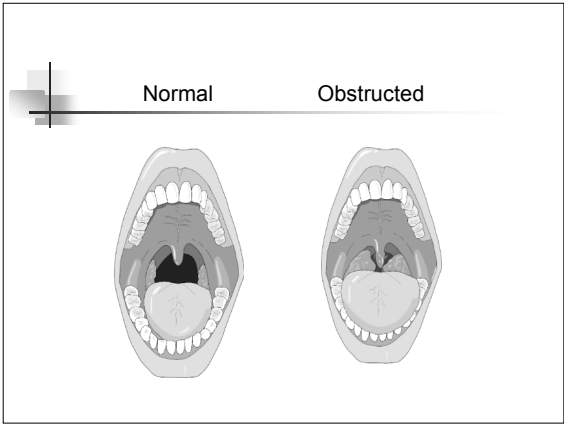
Obstructive Sleep Apnea

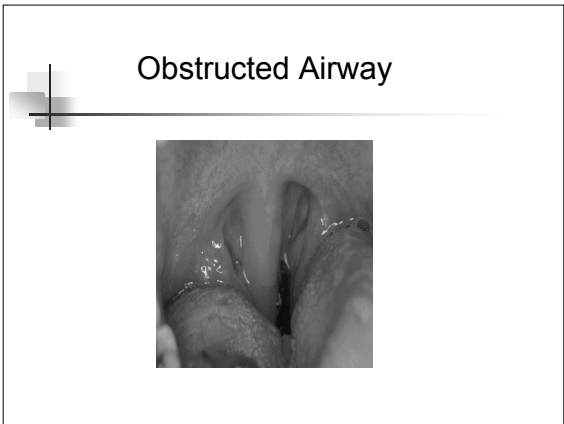
- Most common type of sleep apnea
- Repeated episodes of apnea & hypopnea accompanied by 4% drop in blood oxygen saturation
- Major cause - relaxation of soft tissue in the back of the throat that blocks the passage of air.
- May be magnified by natural loss of the intercostal muscle tone during REM sleep. The intercostals are used to overcome changes to airway resistance.

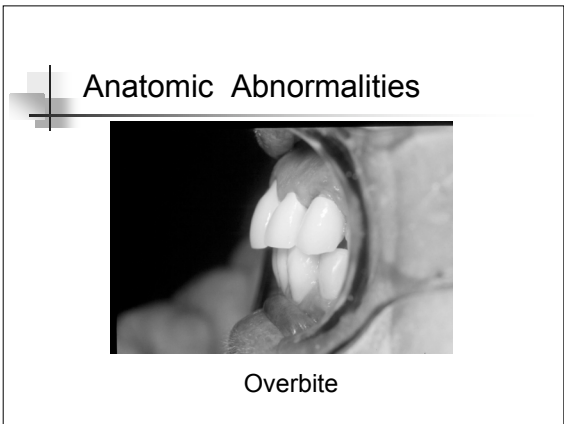










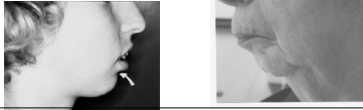


Who is affected

- Both sexes- males more than females
- One in 15 adults will have moderate to severe sleep apnea
- 20%-30% of older adults
- Children can also have sleep apnea
- More common in African Americans or Hispanics

Risk Factors

- Habitual Snoring
- Being Overweight BMI > 30
N.B. Between 30-50% of patients will not be obese
- Neck Circumference >17 in.men,>16 women
- Narrow airway -receding jaw, tonsils, adenoids



Risk Factors (cont)

- Age –occurs more often in people > 65 (loss of muscle mass)
- Familial Tendency
- Use of alcohol, sedatives or tranquilizers
- Hypothyroidism (mechanism not fully understood)
- Parkinsonism, Myasthenia Gravis, Muscular Dystrophy (impairment of nerves controlling muscles of upper airway)

Risks (cont)

- TMJ Arthritis
- Nasal Obstruction
- Smoking – tobacco can cause upper airway inflammation

Day Time Symptoms

- Excessive Daytime Sleepiness
 - Falling asleep while driving, at meetings
 - Napping
- Morning Headache
- Dry Mouth, Sore throat, Nasal Congestion
- Irritability or Mood Change
- Difficulty concentrating

Night Time Symptoms



Habitual Snoring – (crescendos, gasps, snorts) followed by periods of apnea

Night Time Symptoms

- Frequent awakenings
- Choking or Gasping During Sleep
- Nocturia and Enuresis
- Esophageal Reflux
- Increased Sweating
- Mouth Breathing
- Periodic leg jerks, and restlessness

Consequences of OSA



Fatigue, unrefreshing sleep, headaches, strokes and seizures.

Nighttime choking, coughing or shortness of breath.

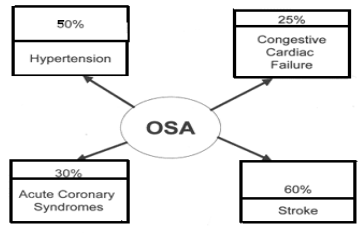
Nighttime chest pain, heart attack, palpitations, congestive heart failure, racing heart, oxidative stress and high blood pressure.

Slide courtesy of James O'Brien, MD

Consequences of sleep apnea How bad is it?

- Hypertension
 - Sleep Heart Health Study (2000)
 - 6000 individuals over age of 40
 - Independent association between OSA & hypertension
- Stroke, Arrhythmias, Nocturnal Angina
 - Non Dipping Blood Pressure
- National Center of Sleep Disorders Research estimates that cardiovascular deaths attributable to obstructive sleep apnea alone may be as high as 38,000 annually

Prevalence of Sleep Apnea in people with Cardiovascular & Cerebrovascular disease



Consequences (cont)

- Obesity
 - Sleep Deprivation
 - Decrease in Leptin, a hormone released by fat cells that signals satiety to brain
 - Increase in Ghreline, a hormone released by the stomach that stimulates appetite

Chasens and others / Insulin Resistance and OSA 89

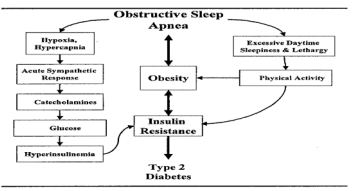


Figure 1. Obstructive sleep apnea-diabetes interaction model.

Insulin Resistance and Obstructive Sleep Apnea – Chasens, Weaver, Umlauf – Biological Research for Nursing 2003

Insulin Resistance – Impaired Glycemic control

- Sleep Deprivation
 - Decreased Brain Glucose Utilization
 - Increased Cortisol Levels – rapid release of glucose in the system
 - Increase in “fight or flight” response
- A study by Babu in 2005 showed the chronic nightly use of CPAP (4 hours or more) for >50 days caused significant reduction in glucose levels

Consequences (cont)

- Depression
- Cognitive Impairment
 - Query lack of REM Sleep
 - Wandering behavior & confusional arousals may occur, particularly in patients with dementing disorders
- Injury due to accidents
 - Driving accidents

Have you ever arrived home in your car but couldn't remember the trip from work?



Diagnosis

- Epworth Sleepiness Scale
 - Normal is total score of less than 11.
 - Mild daytime sleepiness is a score of 11-14.
 - Moderate to severe is a score higher than 14

Diagnosis (Cont)

- Interview with Client and Partner
- Sleep Diary
- Sleep Test - Polysomnogram



Sleep Diary

National Sleep Foundation
Sleepiness Diary
 (2nd Week)

WEEK ON: _____

The faces on the scale below represent different levels of sleepiness from being wide awake (0) to falling asleep (4). At the times indicated on the chart record with a 0, 1, 2, 3, or 4 for each day which face most represents how you feel at the given time.

The three statements on the left in the table below represent difficulties staying awake. For each day of the week, record how frequently during the day you experience this level of sleepiness.

0: Not at all 1: Occasionally 2: Some of the time 3: Most of the time 4: All of the time

	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Waking (0-4)							
Awake (0-4)							
Awake (0-4)							
Awake (0-4)							

For each day below, record how much you slept the previous night and how much time you spent napping during your day in hours (__: __) and minutes (__: __). Then, enter your total sleep time.

	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Hours							
Minutes							
Total							

NATIONAL SLEEP FOUNDATION
 1122 K STREET, NW, SUITE 500, WASHINGTON, DC 20005
 www.sleepfoundation.org

Polysomnography



Stroke occurred when sleeping

Sleep Study Sensors



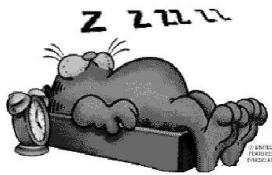
- EEG – to determine the sleep stages through brain waves.
- EOG – Electroculogram to measure eye movements
- EMG – Electromyogram under chin to measure muscle tone
- Airflow: A sensor or two placed on upper lip to monitor the airflow through nose & mouth.
- Breathing effort: 2 expandable belts that fit around chest & abdomen. Belts record movement of those areas to show how hard you are trying to breathe.

Sleep Study Sensors (cont)

- Oxygen level: A probe with a red light is placed on a finger. This is connected to an oximeter, which is used to monitor blood oxygen level throughout the night.
- Heart rate: Two or three electrodes placed on the chest will monitor heart rate and rhythm.
- Video monitoring body position & snoring: An infrared camera may be present which will allow the technologist to observe & note any body position changes as well as unusual sleep behaviours.
- A snoring sensor (either a microphone or vibration sensor) may be placed near the throat.

Treatment

- Positional Therapy



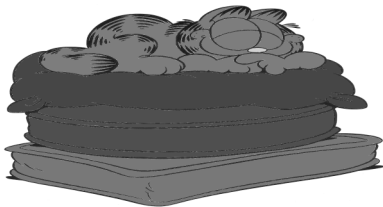
Don't sleep on your back

Wake UP!!! Put on your Tennis Ball tee shirt so I can get a good night sleep



Treatment

- Pillows
 - Body Pillow
 - Neck Pillow



Sleep Apnea Shirt



Behavioural Treatment

- Avoid alcohol and sedation at night
- Avoid muscle relaxants at night
- Avoid nasal sprays that may cause rebound congestion (stick to saline)
- Practice good "sleep hygiene"
 - Fixed bedtime
 - Comfortable room temp
 - Quiet and dark environment
 - Light snack – warm milk
 - Relaxation techniques

Oral Appliances: What They Do

- Repositions the lower jaw, tongue, soft palate
- Pulls the tongue forward away from the throat



Oral Appliances

- Tongue Retaining Device- to hold tongue stable

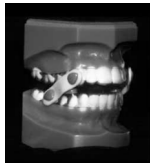


- Holds mandible in position



Oral Appliances

- Adjustable Repositioning Mandibular Device



Continuous Positive Airway Pressure CPAP




Nasal Pillows



Full Mask

CPAP Problems

- Compliance
 - Claustrophobia
 - Training
 - Humidifier
 - Chin Strap



Surgeries

- Nasal, Septal and Adenoid Surgery
- Uvulo-palato-pharyngoplasty UPPP
 - Partial removal of the uvula and reduction of the soft palate
- Genio-Glossus Advancement (GGA).
 - A procedure that tightens the front tongue tendon; reducing the degree of tongue displacement into the throat.
- Maxillo-mandibular Advancement (MMA)
 - Double jaw advancement - the upper and lower jaws surgically moved forward

Nurses Role

- Assess
 - Symptoms – snoring, sleepiness, headache
 - Weight, neck circumference, tonsils, adenoids, nasal obstruction
 - Psychological – depression, marital stress
Quality of life
- Support

Articles and Websites

- www.lung.ca – search for sleep apnea
- www.nhlbi.nih.gov – sleep apnea & national center on sleep disorders research
- www.sleepapnea.org – American Sleep Apnea Association
- www.sleepfoundation.org – National Sleep Foundation

Sleep Awareness Week

March 3-9, 2008





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