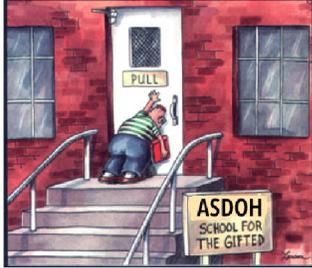


## SLEEP HEALTH

*"If you don't snooze, you lose!"*



Bruce White DDS  
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## Why should we care?

- How do you see dentistry operating as a profession in the next 5 to 10 years?
- We need to reverse the mindset that dentistry is a commodity and to increase the value in oral health by showing the relationship between oral health and overall health.

## Why should we care?

- We exist to make a difference in people's lives through excellent patient care.

Dr. Robert Groves  
CMO Banner University

## Why Should we care?

- Health Care Provider
- Commodity
- Service
- Higher level of health
- Working together
  - Facilitator
- Better Sleep
- Greatest impact health

## Cambodia Statistics

- GDP Growth
  - 7.7% top 10 past 10 ys.
  - 2016 –least developed to lower moderate.
- Life Expectancy
  - 1999- 46.8 ys
  - 2014- 72ys
- Health Care- Research has found that trust in health care providers is a key factor in improvement of people's health.

## Is There a Need

- Harvard Medical School Review
  - 18.9 million undiagnosed cases of OSA
  - 40% are CPAP non compliant
  - 7.56 million patients in need of OA
- SGS Statistics
  - 4% dentists practice sleep medicine
  - 8,000 dentists
  - 950 patients per dentists
  - 40% of current CPAP users

## Sleep Apnea and Health

- Direct correlation with diabetes and hypertension
- Relationship with the following:
  - GERD
  - High cholesterol
  - Weight gain
  - Depression
  - Cardiovascular disease
  - Poor sleep / Daytime sleepiness
  - Heart related issues

## Sleep Apnea and Health

- Prevalence of SDB in Comorbid Population
  - Drug Resistant Hypertension 83%
  - Type 2 Diabetes 58%
  - Stroke 62%
  - Heart Failure 52%

## Sleep Apnea and Driving

- SA drivers are equally unsafe as drunken ones.
- In 3 of 7 studies, SA drivers did **worse** than people too drunk to drive legally (blood alcohol content above 0.08).
- Auto accident rate for SA drivers is 2.6 times higher than all licensed drivers.
- Severity of car crashes much higher.

## Sleep Apnea and Driving



## Sleep Divorce

- Disrupted Sleep
- 2005 National Sleep Foundation survey- 25% separate beds
- 2103 Canadian research-35%

## Why Do We Need Sleep? (cont.)

- Routine Maintenance-Think of the body as a machine and sleep puts it in "idle" so repairs can be made.
- Sleep allows the body to repair and rejuvenate itself:
  - Immune function
  - Muscle growth
  - Tissue repair
  - Protein synthesis



## Why Do We Need Sleep? (cont.)

- Growth Hormone
- Other hormones for function and regulation.
- **Brain Plasticity** - sleep correlates to changes in the structure and organization of the brain.
- Sleep aids in the ability to learn and perform a variety of tasks in adults.
- Sleep plays a critical role in brain development in infants and young people.

## Sleep Stages

- Sleep is a complex process that occurs in stages. We cycle in and out of these stages from **N1 through REM.**
- Before sleep:
  - Body temperature begins to drop
  - Melatonin hormone begins to increase, signaling the body and brain that it's time to prepare for sleep
  - Before-sleep beta waves
  - Enter sleep; produce alpha waves

## Sleep Stages – N1

- Light sleep
- Theta waves
- Eyes roll slowly back and forth
- Can be awakened easily
- 5% at onset only



## Sleep Stages – N2

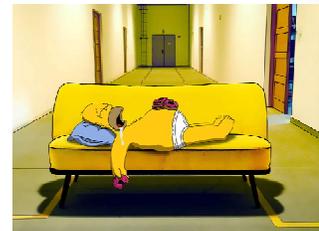
- Brain waves slower
- Higher amplitude
- Body temperature decreases
- Heart rate slows
- Breathing regular
- Light sleep
- 45 to 55%

## Sleep Stages – N3 & N4

- N3 less intense than N4
- Delta waves
- Muscles relax
- Primarily in early part of sleep
  - Deep sleep
  - 15 to 25%

## Sleep Stages - REM

- REM occurs 90 min. after sleep onset
- Rapid eye movement
- Short, choppy theta waves
- Skeletal muscles paralyzed



## Sleep Stages – REM (cont.)

- Becomes longer and more frequent towards morning
- First period lasts 10 min.
- Each recurring REM stage lengthens
- Final REM period up to 1 hour
- Heart rate and respiratory rate speed up

## Sleep Disorders

- Sleep Bruxism
- Snoring
- Obstructive Sleep Apnea

## Sleep Bruxism

- Whatever is driving the clenching muscles is what the treating dentist must address.
- SDB → Bruxism
- Sleep
  - Collapsing airway
  - SNS activation
  - Nighttime bruxism
  - Arousal



## Sleep Bruxism (cont.)

- Night time clenching
  - Compensatory clenching to protect the airway
  - SB provides partial or complete opening of airway
  - As the airway collapses there is a drop in esophageal pressure
    - ✦ Resulting in activation of SNS
    - ✦ Resulting in increase activation of genioglossus muscle, suprahyoids to draw the tongue anterior to increase airway diameter

## Snoring

- **Snoring** – the act of breathing through an open mouth, in a way that causes vibration of the pharyngeal tissues. The reverberating tissues give rise to loud, unpleasant sound.



## Video: Baby Reacts to Snoring



## What Is Sleep Apnea?

- APNEA- When a patient stops breathing for 10 seconds or more and wakes just enough to take a breath.
- Hypopnea- When a patient doesn't stop breathing but the breathing becomes shallow with at least a 30% decrease in air flow for 10 seconds or more with an associated decrease in  $SO_2$  desaturation of at least 3%.

## Obstructive Sleep Apnea (OSA)

- Characterized by recurrent episodes of upper airway collapse during sleep
- The airway is blocked by the collapse of excess soft tissue in the back of the mouth and throat.
- The effect is like trying to drink through a wet paper straw – you keep sucking but nothing gets through

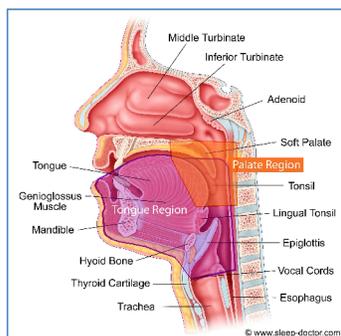
## Obstructive Sleep Apnea (cont.)

- The restriction of air of causes:
  - Decrease of oxygen levels
  - Increase of carbon dioxide levels
  - Sleep is lighter and interrupted
  - Decrease deep, continuous restorative sleep
  - Alerts brain to signal upper airway muscles to open
  - Awakens suddenly with loud gasps of breath

## Video: Sleep Apnea Example



## Diagram: OSA



## Risk Factors for OSA

- Obesity
  - BMI > 30
  - 10% increase in weight , 32% increase in AHI
- Gender
  - Men to women – 2.5 to 1
- Large neck circumference
  - Greater than 17 inches for men, 15 inches for women
- Excessive use of alcohol or sedatives
- Family history of OSA

## Risk Factors for OSA (cont.)

- Smoking
- Upper airway or facial abnormalities
  - Enlarged tongue
  - Constricted maxillary arch
  - Retrognathic mandible
- Snoring
  - 70% of people who snore have sleep apnea
- Diagnosis of hypertension

## Symptoms

- GERD
- Contraction of diaphragm forcing acid up the esophagus
- At same time negative pressure being created by lungs to inhale and pull acid up



## Symptoms

- Excessive daytime tiredness
- Measured by Epworth Scale



## Symptoms

- Poor sleep is linked to risk of developing Alzheimer's
- Sleep problems actually interact with some of the disease processes involved in Alzheimer's and that those toxic proteins in turn affect deep sleep.
  - Amyloid production highest during waking hours and lowest during deep sleep.
  - Brain uses sleep to flush out toxic debris

## Symptoms of OSA

- Lack of energy
- Morning headaches
- Weight gain
- Depression
- Frequent nocturnal urination



## Symptoms of OSA (cont.)

- Hypertension
  - direct relationship between degree of OSA and level of hypertension (50-70% also have OSA)
- Cholesterol
  - decrease HDL, increase LDL
- Nighttime gasping, choking or coughing
- Irregular breathing during sleep (i.e. snoring)

# Screening for Sleep Apnea

## Screening for OSA

- 90%
- Anatomical
- Physical
- Comorbidities
- Questionnaires
  - STOP BANG
  - Epworth (measures tiredness only)
  - Three-Minute Physical Screen

## Anatomical

- Malapati – class differentiations



## Anatomical (cont.)

- Malapati screenings
  - Size and position
  - Soft palate
  - Mandible class II
  - Tonsils
  - Uvula
  - Nasal
  - Snoring – severity of sound and duration

## Physical

- BMI
  - Obese = BMI greater than 30
- Neck Size
  - Male: larger than 17 inches
  - Female: larger than 15 inches

## Comorbidities

- Common comorbidities
  - High Blood Pressure
  - Type II diabetes
  - Stroke
  - Heart attacks
  - A FIB
  - Stents for blockage
  - GERD
  - Headaches and tiredness
  - Depression

## Epworth Sleepiness Scale (ESS)

Situation	Chance of dozing (0-3)			
Sitting and reading	0	1	2	3
Watching television	0	1	2	3
Sitting inactive in a public place—for example, a theater or meeting	0	1	2	3
As a passenger in a car for an hour without a break	0	1	2	3
Lying down to rest in the afternoon	0	1	2	3
Sitting and talking to someone	0	1	2	3
Sitting quietly after lunch (when you've had no alcohol)	0	1	2	3
In a car, while stopped in traffic	0	1	2	3
<b>Total Score</b>				

0 = would never doze 1 = slight chance of dozing 2 = moderate chance of dozing 3 = high chance of dozing  
 Johns MW. Sleep. 1991;14:540

**Interpretation:**

- 0-7: It is unlikely that you are abnormally sleepy.
- 8-9: You have an average amount of daytime sleepiness.
- 10-15: You may be excessively sleepy depending on the situation. You may want to consider seeking medical attention.
- 16-24: You are excessively sleepy and should consider seeking medical attention.

## STOP-BANG Questionnaire For Sleep Apnea

Patient Name: \_\_\_\_\_ Date: \_\_\_\_\_

Please answer the 8 questions below to help us assess for possible sleep apnea, a condition in which your breathing pauses or stops for periods of time while you sleep. Sleep apnea can increase your risk for many health conditions.

*Note: If you already have a diagnosis of sleep apnea, you do not need to complete this questionnaire.*

- Yes No **Snoring:** Do you snore loudly (louder than talking or loud enough to be heard through closed doors)?
- Yes No **Tiredness/Fatigue:** Do you often feel tired, fatigued, or sleepy during the daytime, even after a "good" night's sleep?
- Yes No **Observed apnea:** Has anyone ever observed you stop breathing during your sleep?
- Yes No **Pressure:** Do you have or are you being treated for high blood pressure?
- Yes No **Body mass index:** Do you weigh more for your height than is shown in the tables below?
- Yes No **Age:** Are you older than 50 years?
- Yes No **Neck size:** Does your neck measure more than 15" around for females? Or 17" for males?
- Yes No **Gender:** Are you male?

Height	Weight (lb)	Height	Weight (lb)
4'00"	167	5'00"	230
4'11"	173	5'07"	237
5'	179	5'10"	243
5'1"	185	5'11"	250
5'2"	191	6'	258
5'3"	197	6'1"	265
5'4"	204	6'2"	272
5'5"	210	6'3"	279
5'6"	216	6'4"	287
5'7"	223	6'5"	295

**Number of Questions Answered? Yes:**

- OSA - High Risk: Score is 5-8
- OSA - Intermediate: Score is 3 or 4
- OSA - Low Risk: Score is 0-2

What is the likelihood this person has OSA?

1



What is the likelihood this person has OSA?

2

He looks healthy enough...but can he have OSA?



## Treatment

- Chief Complaint- My wife sleep's in a different bed and I'm awake multiple times at night
- S-y
- T-n
- O-n
- P-y
- B-n
- A-y
- N-n
- G-y
- Score-4

## Treatment

- Comorbidities
  - HTN 3 meds
  - High Cholesterol
- Family history of heart attacks
- Malampati

## Treatment Options for OSA

- CPAP
- Surgery
- Oral Appliance
- Life Style Change



"Whoa! That was a good one! Try it, Hobbs — just poke his brain right where my finger is."



End the Torture  
of CPAP Masks

## Treatment options – CPAP

- Therapy utilizes positive airway pressure to create a pneumatic air splint reducing pharyngeal constriction
- Continuous positive airway pressure
- Pressure level related to severity of sleep apnea
- Gold standard for physicians
- Amount of pressure determined in lab titration procedure
  - Split night
  - Adjustments done in lab
  - Instant AHI results

## Treatment Options – OA

- Success rate varies
- Compliance 90%
- Best used for mild to moderate AHI



## Clinic Experience

- Screening
- Testing
- Diagnosis
- Treatment
- Practice managemnet