WHAT CLUES DO WE FIND IN THE MEDICAL HISTORY?
POSSIBLE SYMPTOMS OF OBSTRUCTIVE SLEEP APNEA

• High blood pressure
• Type II Diabetes
• Depression
• Morning headaches
• Reduced libido
• Frequent trips to bathroom at night
• Unable to lose weight
POSSIBLE SYMPTOMS OF OBSTRUCTIVE SLEEP APNEA

- Restlessness during sleep
- Reduced mental function
- Poor judgment
- Memory loss
- Quick to anger
- Nighttime chest pain
• Snoring
• Snoring with pauses in breathing
• Daytime drowsiness
• Breathing cessation noticed by partner
• Gasping or choking during sleep
• MAINLY 2 THINGS EFFECT PATIENT
  o 1. Oxygen desaturation
  o 2. Lack of restorative sleep
• BOTH CAUSE MAJOR PROBLEMS

POSSIBLE SYMPTOMS OF OBSTRUCTIVE SLEEP APNEA
30% of all pregnant women snore

• Women who snore habitually deliver developmentally-retarded babies 7% of the time

• Women who snore occasionally deliver developmentally-retarded babies 2.3% of the time

Oxygen saturation is a major component of OSA

- Repeated breathing stoppages inhibit the body's ability to process oxygen.
- Typically it is cause for concern if oxygen levels get below 90%
  - Most hospitals will put patients on oxygen masks if they drop below 92%
  - It is not uncommon to see people with OSA drop into the 80’s, 70’s, 60’s and even 50% range.
- Consequences of low oxygen saturation (hypoxemia) range from irreversible brain damage to heart attack and stroke.

**Interesting Fact:**
How long do you have to hold your breath to get to 90% saturation?

30 seconds? 1 minute? 2 minutes? It’s almost impossible to get someone to drop to 90% by simply holding their breath – further emphasizing the point of how severe sleep apnea is.
Why is excessive sleepiness, lack of energy & fatigue a symptom?

- Frequently when your body pulls you out of an apneic event it is accompanied by a micro-arousal.
  - A micro arousal doesn’t necessarily wake you up from sleep, but it pulls you out of whatever sleep stage you were in.
- The result is a **disrupted sleep pattern and insufficient amounts of sleep**.
- OSA patients spend significant amounts of time at night in a ‘**fight or flight**’ state with elevated blood pressure, heart rate and respiration.
- People do not feel rested in the morning because they spent the night fighting to breath.

Impact of excessive sleepiness.

- Social implications, mood changes, irritability, lack of energy.
- **Alcohol/Sedatives**
- Alcohol consumption (especially before bedtime) and sedative use (even sleeping pills) can contribute to OSA. They relax muscle tone in the upper airway which can lead to airway collapse and OSA.

- **Smoking**
- Smoking, while not a sedative, can also increase risk for OSA. Smoking irritates and inflames the tissues of the upper-airway. Even a slight amount of inflammation can narrow the airway enough to cause a problem.

Risk Factors – Alcohol / Sedative Use & Smoking
“Depression” or “chronic fatigue syndrome” is readily diagnosed in patients with the primary complaint of fatigue. Accordingly, these patients are treated with antidepressant medications although unrecognized sleep apnea may be present.”
Why is high blood pressure a symptom? – Two reasons

- There is a sympathetic (emergency) response in the body every time an apnea or hypopnea occurs.
  - Heart rate and blood pressure increase
  - OSA Patients have hundreds of events per night, thus the body remains in a constant state of elevated blood pressure.

- Because the body is not getting sufficient oxygen, it is not converting enough into nitric oxide.
  - Nitric oxide is a vasodilator, without nitric oxide blood vessels narrow.
  - The endothelial lining of the arteries breaks down, making them more susceptible to plaque and fatty tissues building up.
  - Narrow arteries with high risk of blockage = High Blood Pressure, heart attack and stroke.

- OSA increases hypertension risk by 45%
Oxygen goes down - BP goes up

CO2 goes up - heart rate goes up

• This combination results in 3-5AM

• “he died in his sleep”
Why are headaches a symptom of OSA?

- Three types of headaches have been directly linked to the presence of OSA.
  - Migraine
  - Cluster Headaches
  - Dull Morning Headaches

- All are caused by different things, **morning headaches and cluster headaches have been linked to oxygen desaturation events.**

- Migraine headaches are correlated with REM & Delta sleep patterns which are severely disrupted in patients with OSA.
Why is Diabetes a symptom of OSA?

Classic “which came first” scenario.

- Obese patients are more likely to have OSA, they are also more likely to have diabetes.

- Perpetual lack of sleep in healthy young adults results in changes in glucose metabolism and endocrine functioning.

- “The presence of recurrent hypoxemia and abnormal nocturnal sympathetic output, which are well-demonstrated properties of obstructive sleep apnea, has been the proposing mechanism in the casual link between SDB and insulin resistance.”

  Tasali, Esra MD et al. Sleep Disordered Breathing and the current epidemic of obesity. Consequence or contributing factor.


OSA’s Deadly Path
Why is sexual dysfunction a sign of OSA?
- Lack of nitric oxide in the body narrows arteries and decreases blood flow to all areas of the body.
- The major erectile dysfunction medications all function by causing a spike in nitric oxide production, which causes vasodilatation and increased blood flow. (this is why they all have warnings about taking them if you have low blood pressure – because the vasodilatation will further lower it)
- Nitric oxide is also a released to activate the egg to complete meiosis II.

Why are social problems a sign of OSA?
- Simple equation.
  - OSA = Poor Sleep = Unhappy, grumpy, irritable person = work/relationship/school problems
Apneic events cause a disturbance in the blood chemical balance favoring formation of free radicals.

This oxidative stress causes damage to the blood vessel lining (endothelium).

NEW?? #1 cause of Atrial Fibrillation is Sleep Apnea

OSA and CVD link – Oxidative Stress
Because of all the cardiovascular damage that’s occurred because of the sleep apnea people with OSA are at great risk for heart attack and stroke.

OSA increases this risk more than any other single factor – including smoking, obesity etc.

Nearly 80% of nocturnal strokes can be directly attributed to
Alcohol/Sedatives

Alcohol consumption (especially before bedtime) and sedative use (even sleeping pills) can contribute to OSA. They relax muscle tone in the upper airway which can lead to airway collapse and OSA.

Smoking

Smoking, while not a sedative, can also increase risk for OSA. Smoking irritates and inflames the tissues of the upper-airway. Even a slight amount of inflammation can narrow the airway enough to cause a problem.
FINALLY – Some good news….not really

IF you survive the snoring, sleepiness, car accident risk, acid reflux, headaches, high blood pressure, heart attacks and strokes…..

New research from Stanford University is showing a strong relationship between OSA and dementia & Alzheimer's Disease. So maybe you’ll forget about all the things OSA has caused.

A USC study showed that 70% of dementia patients had sleep apnea and there was a strong correlation between the severity of cognitive impairment and the severity of the apnea.
If you took a cross section of OSA patients in their 20’s and 30’s the ratio of Men to Women would be about 7–1

Those ratio of those same patients in their 50’s and 60’s would be about 2–1 in numbers with OSA.

As women’s hormone production slows – their body changes the way it deposits and stores fat. Neck size increases as does OSA.
Women with Polycystic Ovarian Syndrome are 30x more likely to have Sleep Disordered Breathing than controls.

Source: Alexandros N.V. Et. Al – Journal of Clinical Endocrinology & Metabolism
The shape of things to come
Why does obesity and large neck circumference contribute to OSA?

- Fat deposits in the neck put outside pressure on the airway tissues making it more narrow.
- Larger tongues obstruct the airway.
- Thousands of studies have documented the correlation between weight & OSA.

**OSA Fact:**
A neck size of >17” for men and >15” for women is a clinically significant risk factor for OSA.
LEPTIN IS A NEUROTRANSMITTER PRODUCED BY FAT CELLS AND REGULATES APPETITE. IT TELLS THE BODY IF IT NEEDS FOOD. DURING SLEEP DEPRIVATION, LOW LEPTIN LEVELS INCREASE APPETITE.
SWEETS, STARCH, AND SALT IN THOSE BETWEEN THE AGES OF 32 AND 49

over 49 they are dead?

under 32 other factors (activity?) play a role
1 Billion people in the world are overweight (BMI > 25)

300 million of those are clinically obese (BMI > 30)

Major risk factor for chronic diseases—diabetes, CVD, hypertension, stroke & OSA

BUT DO NOT LET THE PREVALENCE OF OVERWEIGHT PEOPLE WITH SLEEP APNEA FOOL YOU INTO MISSING APNEA IN NON-OBESE PATIENTS

A 10% weight loss can reduce Apnea by 50% – Like ACE guy
IN ADDITION TO THE MEDICAL HISTORY CLUES MENTIONED BEFORE

WHAT ARE SOME DENTAL CLUES WE HAVE?
Why is acid reflux or G.E.R.D (Gastro Esophageal Reflux Disease) a symptom?

- When breathing is stopped, the body increases efforts to take in air.
- **Abdominal contractions are exaggerated, and get worse if breathing does not begin.**
- These contractions squeeze the stomach and force acid up.
- **Negative pressure builds up** in the esophagus because of efforts to breathe. This helps pull acid up as well.
ENLARGED TONSILS
High Palatal Vault and 4 on the floor
- Anatomic Abnormalities
  - An enlarged tongue, constricted maxillary arch, high palate, retrognathic mandible, deviated septum and a variety of other conditions relating to tongue and mandibular position as well as narrow facial bone structure can have and adverse effect on the airway.

Risk Factors – Anatomic Abnormalities
Mallampati Classification
Enlarged Tongue
Scalloped Tongue
snoring, inflammation, smoking etc.
Bruxism
Why people brux and clench at night...

...To protect the collapsing airway!!!
Pediatric Obstructive Sleep Apnea
- Usually caused because of enlarged tonsils and adenoids. Narrow maxillary arch and mouth breathing are contributing factors.
- Often seen in children who are smaller, less developed and underweight because of a disruption in the nighttime secretion of growth hormone.
- These children have that narrow face, high palate, retrognathic chin and dark circles around eyes and are considered less “bright”
- Many can be helped young with widening palate
- Bottle feeding related to narrow arch
Complications of Obstructive Sleep Apnea in children

ADD / ADHD

One study concluded that 75% of ALL ADHD could be eliminated if children’s habitual snoring and sleep related breathing disorders were effectively treated. (Chervin et. al, sleep)

Poor growth and development – need growth hormone during delta sleep

Orthodontic problems

Increased chance of OSA as an adult

Pediatric OSA Complications
Airway Obstruction – Effects to the Pediatric Patient

- Snoring
- Increased Prevalence of Throat Infections
- Bed Wetting – Due to oxygen level drop causing arousal
- High Rate of Disturbed Sleep – link to ADD & ADHD
- Alteration of Facial Growth – Causes long face syndrome, retrognathic mandible
- Alteration of Jaw Development – Causes some type of Malocclusion, TMJ dysfunction caused by malocclusion
LEGALLY….ONLY AN MD CAN DIAGNOSE SLEEP APNEA THROUGH A SLEEP STUDY
Which one is better?

- **Home Study**
  - Less accurate study of a much more typical night’s sleep

- **PSG**
  - More accurate study of a less typical night’s sleep
What are they looking for?

Classic sleep disordered breathing. Narrowed airflow (hypopnea) followed by oxygen desaturation followed by gasps (snoring) and increased efforts to breathe. This raw data is normally 'scored' manually.
ONLY 2 OR 3 out of every 100 people with OSA have been successfully treated!!!!!!

The lack of diagnosis of sleep apnea is unprecedented for a disorder as deadly as it is.

Do you think there is a market for a more acceptable treatment option?

The OSA Epidemic DO WE HAVE A ROLE?????
WHO ARE WE LOOKING FOR?

- Snorers without sleep apnea
- Bed partners of snorers
- People with undiagnosed sleep apnea
- People with sleep apnea who are not complaint with their C-PAP or do not wish to travel with it
- People with a C-PAP who might not need one
YOU CANNOT JUST TREAT SNORING OR APNEA WITHOUT THE PROPER MEDICAL PROTOCOL
Snoring Fact: 70% of the time, loud snoring is indicative of OSA
CPAP - IT WORKS...... If YOU WEAR IT!!
SO WE WILL OPEN THE AIRWAY BY MOVING THE LOWER JAW FORWARD AND OPEN
With and Without Appliance
With and Without Appliance