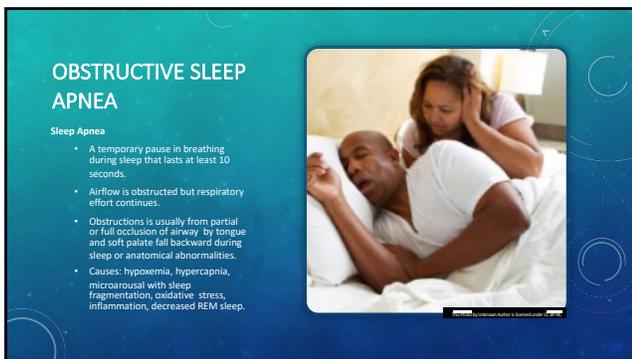
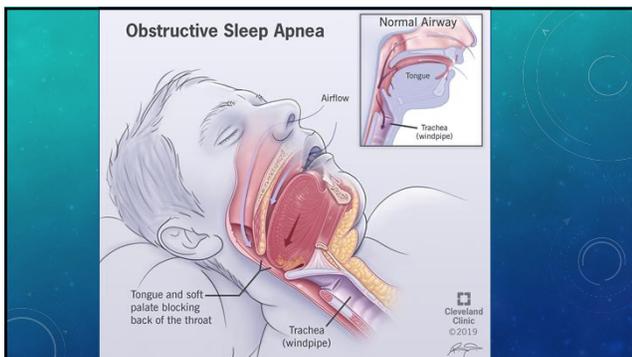


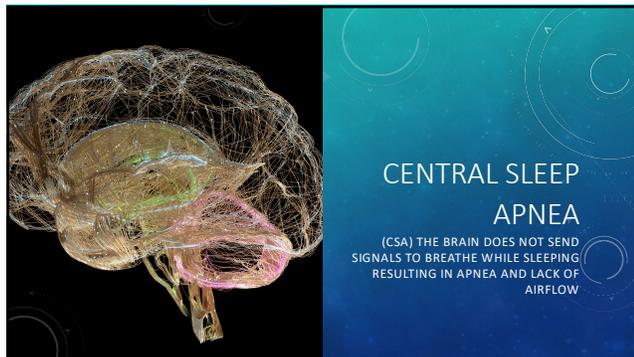
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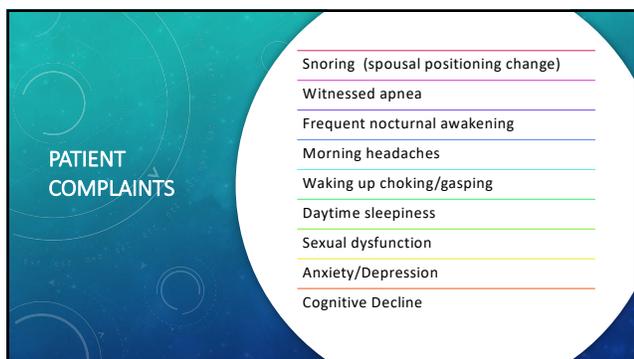
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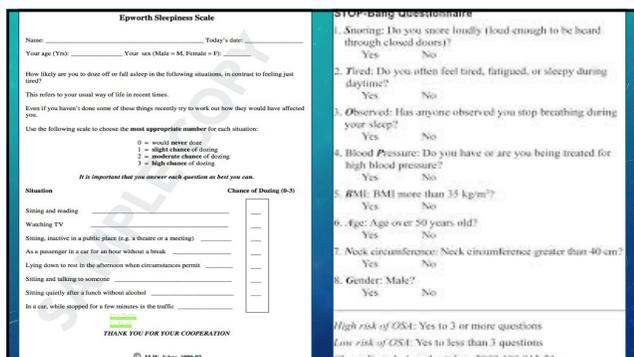
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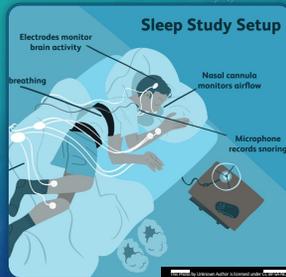
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6

DIAGNOSIS

- Polysomnography with findings:
- Apnea-hypopnea index (AHI) or respiratory disturbance index (RDI) 5 or greater and less than 14 if comorbid symptoms exist.
 - AHI or RDI greater than or equal to 15 in the absence of comorbid factors.



7

TREATMENT

Positive Airway pressure (PAP)

- CPAP
- BiPAP
- APAP
- ASV



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TREATMENT

Dental Device (Only for OSA)

- Option for those intolerant of PAP with mild to moderate OSA.
- Keeps airway open by advancing mandible forward or keeping the tongue from blocking the airway.
- Made by a dentist or sleep specialist.



<https://www.clevelandclinic.org/healthinfo/ShowImage.a.shx?PIC=4403&width=450>

9

WHOSE AT RISK?

Sleep apnea affects up to twenty-five million adults in the U.S.

Sleep apnea is more prevalent in African Americans, Hispanics and Native Americans than Caucasians.

Men are more likely to have sleep apnea when young but equals between men and women later in life due to hormone changes.

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WHY DOES IT MATTER?

Untreated sleep apnea is associated with higher occupational and vehicular accidents.

Untreated Sleep apnea is associated with high healthcare-associated cost and burdens the healthcare system.

Sleep apnea is on the rise, thought to be related to increasing rates of obesity.

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POSSIBLE COMORBIDITY

- Pulmonary hypertension
- Systemic hypertension
- Cardiac dysrhythmias
- Right or left ventricular failure
- Right ventricular hypertrophy
- Increased risk of myocardial infarction
- Increased risk of stroke
- Nocturnal angina
- Exacerbation of COPD
- Insulin Resistance
- Endothelial cell dysfunction

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ADHERENCE

Despite these positive outcomes of PAP therapy, adherence is low with only 30-60% of patients utilizing their devices.

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ENDOCRINOLOGY

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DIABETES TYPE 1

- At higher risk to develop OSA but not related to obesity.
- Thought to be related to autonomic neuropathy.
- No data to show an association between OSA and glucose levels.

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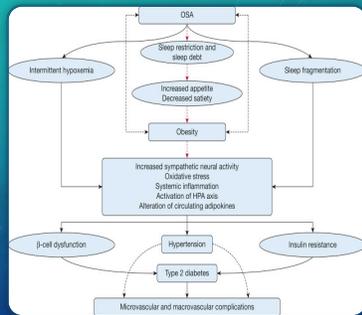
DIABETES TYPE 2

- Unknown links of diabetes and OSA though we know there is one. Thought to be bi-directional as patients with type 2 diabetes are more likely to develop OSA.
- One study showed that patient with type 2 diabetes have an almost 50% increased risk for developing OSA.
- Another study found the higher the severity of OSA, the higher chance of increased hgbA1C indicating poor glycemic control.

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DIABETES TYPE 2

- Intermittent hypoxia enhance sympathetic activity.
- Drives up oxidative stress and chronic inflammation resulting in derangements in glucose metabolism.
- Sleep fragmentation and deprivation may impact insulin sensitivity and alterations in the growth hormone and cortisol secretion.



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CARDIOLOGY

18

CARDIOLOGY

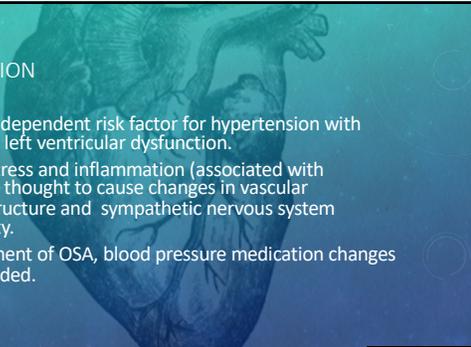
Patients with OSA are at a higher risk of death from sudden cardiac arrest.



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HYPERTENSION

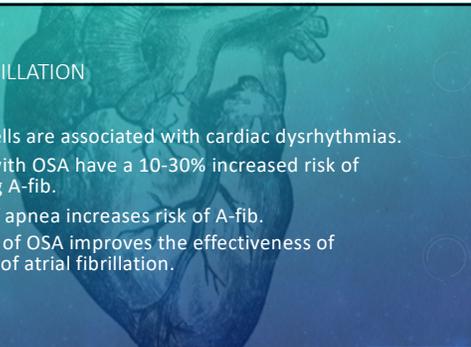
- OSA is an independent risk factor for hypertension with subsequent left ventricular dysfunction.
- Oxidative stress and inflammation (associated with hypoxemia) thought to cause changes in vascular function/structure and sympathetic nervous system hyperactivity.
- With treatment of OSA, blood pressure medication changes may be needed.



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ATRIAL FIBRILLATION

- Apneic spells are associated with cardiac dysrhythmias.
- Patient's with OSA have a 10-30% increased risk of developing A-fib.
- Severity of apnea increases risk of A-fib.
- Treatment of OSA improves the effectiveness of treatment of atrial fibrillation.



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CONGESTIVE HEART FAILURE

- Sleep apnea is more prevalent in patient with chronic congestive heart failure.
- Treatment of sleep apnea can improve heart failure.
- Congestive heart failure can be a result of OSA due to left ventricular dysfunction (thought to be combined from overreaction of sympathetic nervous system and hypertension).
- Central sleep apnea, vice versa, can be caused by CHF.
- Associated with increased mortality in patients with CHF.

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UROLOGY

23

NOCTURIA

- Unknown link between nocturia and sleep apnea.
- In older adults, degree of apnea corresponds with severity of nocturia.
- Studies suggest nocturia may be as indicative of OSA as snoring. Patients need to be screened with a sleep questionnaire when complain of nocturia.

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PSYCHOLOGY

25

PSYCHIATRY

- Frequent arousals/microarousals cause loss of REM sleep leading to excessive daytime sleepiness.
- Daytime sleepiness can lead to decreased work productivity, imbalance in home life, cognitive decline, moodiness, and irritability.
- Depression and anxiety are frequently seen in patients with sleep apnea. Some studies find improvement in these symptoms with treatment of OSA.



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NEUROLOGY

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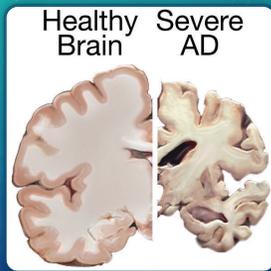
NEUROLOGY

- Sleep fragmentation and intermittent hypoxia affects brain structure and brain function.
- Arteriosclerosis, stroke, tumors, hemorrhage, head trauma, encephalitis, poliomyelitis can cause central sleep apnea.
- Untreated sleep apnea is associated with cognitive decline (memory loss, decreased concentration).

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ALZHEIMER'S DISEASE

- Recent studies show untreated OSA is associated with earlier mild cognitive decline and Alzheimer's disease.
- Treating sleep apnea may help with cognitive functioning.



29

PULMONOLOGY

30

PULMONARY HYPERTENSION

- Mild pulmonary hypertension is possible in patients with sleep apnea even without pulmonary disease.
- Caused by left heart dysfunction resulting in vascular remodeling and hypoxic vasoconstriction.
- Treatment improves severity.

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COPD

- COPD and OSA in conjunction are often called "the overlap syndrome".
- Associated with increased morbidity and mortality.
- At an increased risk for pulmonary insufficiency and prolonged periods of hypoxemia.
- Goal is to treat each condition separately to promote oxygenation. Some patients require oxygen bleed into PAP device during use.

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THE ROLE OF THE PRIMARY CARE PROVIDER

- Screening with the ESS or STOP-BANG when patients complain of fatigue or other sleep apnea symptoms.
- Follow up on sleep apnea treatment adherence at annual appointments.

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REFERENCES

Durphy L., Winland-Brown, J., Porter B., Thomas D., (2019). Primary care: The art and science of advance practice nursing – an interprofessional approach. F.A Davis
