

OSA: Getting to the Root of Our Patient's Sleepless Nights

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Learning Objectives

1. Identify signs and symptoms related to obstructive sleep apnea.
2. Recognize the risks of OSA and co-morbid conditions.
3. Determine when a referral for a sleep study should be recommended.
4. Identify possible treatments for OSA.

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Case Study

- Mr. (SA) is a 55 year old male who comes to your office with complaints of shortness of breath. He has gained 10 lbs over the past 6 months and feels that his breathing is more difficult when walking up a flight of stairs. There has been no cough or sputum production and he has no other respiratory complaints. He is here at the insistence of his wife and feels that he will probably be back to normal if he loses the extra weight. He has a history of childhood asthma but has not had any exacerbations as an adult. His past medical history is also relevant for hypertension, recently diagnosed non-insulin-dependent diabetes, and hyperlipidemia. His is an ex-smoker and quit 10 years ago with a 10 pack-year history of smoking. He works as a bank executive and is married with 2 children. He denies any occupational exposures.
- His wife, who accompanies him on this visit, mentions that he has been more tired lately when he comes home from work and has trouble concentrating on tasks. She often finds that he has dozed off in front of the TV while waiting for dinner. He has restless sleep during the night, and she is getting tired of having her own sleep disrupted with his loud snores. He does little else but sleep during the weekend and she worries that might be a sign of depression.

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Obstructive Sleep Apnea Background

- Common sleep-related breathing condition
- Characterized by complete or partial airway collapse
 - Cessation or airflow
- It can affect pediatric and adults
 - Most common older men and post menopausal women
 - Premenopausal nonspecific

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Prevalence and Facts

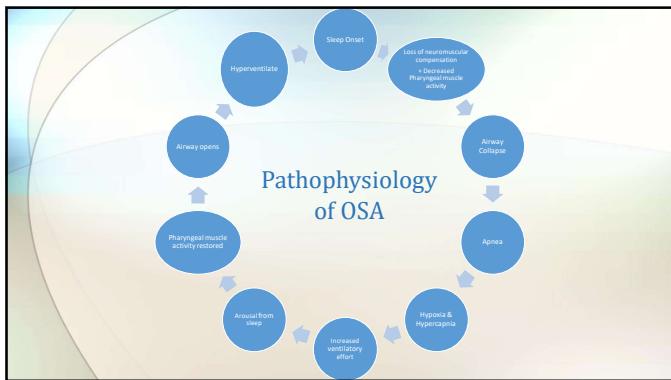
- 5-10% of adults in US have OSA
- Prevalence highest in Asians, Hispanic women, African – Americans
- 75-80% patient not identified
- 1 in 4 patient at risk for OSA
- 10% weight gain associated with 6-fold increase risk in OSA
- “hunger hormone” is higher in OSA patients

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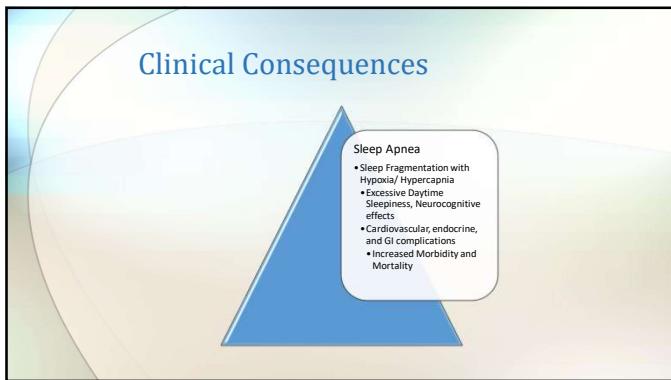
How Sex and Obesity Play a Role

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| <ul style="list-style-type: none"> • OSA risk in males > than females in adults up to age 50 • Prevalence because equals in older adults <ul style="list-style-type: none"> ◦ Menopause and estrogen • Older women have 5-fold increase than younger women • Older men only 2-fold increase than younger men | <ul style="list-style-type: none"> • Obesity increasing in US and increase prevalence of OSA • Weight increase worsen OSA • Weight decreased reduce severity • Sleep Heart Study <ul style="list-style-type: none"> ◦ Obese with larger neck circumference 1.5X to moderate to severe OSA |
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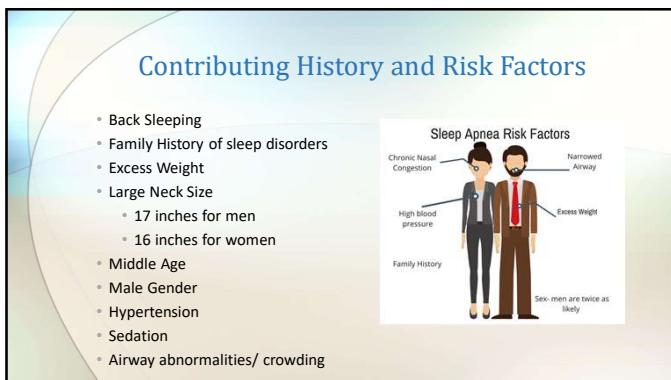
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External Dangers of OSA



- Associated with increased risk for vehicle crashes
- Studies estimate crash risk increased between 1.2 and 5-fold
- Factors that may further increase risk of accident include BMI, higher AHI, or severity of hypoxemia

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Co-morbidities Associated with OSA

- | | |
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| <ol style="list-style-type: none"> 1. Hypertension 2. Obesity 3. Diabetes Mellitus Type 2 4. Tobacco use history 5. Chronic Ischemic Heart Disease 6. COPD | <ol style="list-style-type: none"> 7. Pure hypercholesterolemia 8. Hypertrophy of tonsil/adenoids 9. Current tobacco use 10. CHF 11. Atrial fib or flutter 12. GERD |
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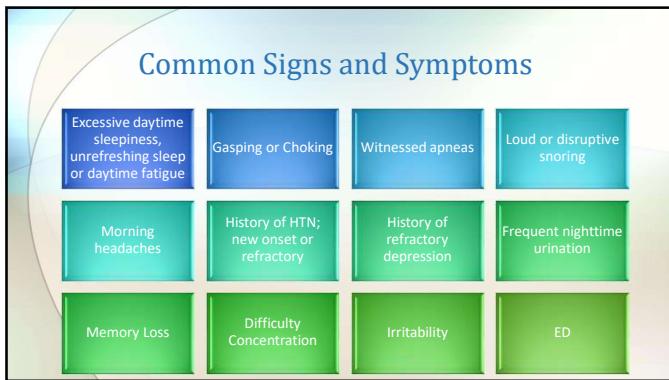
Start the assessment

Ask these four questions to assess your patient for sleep apnea:

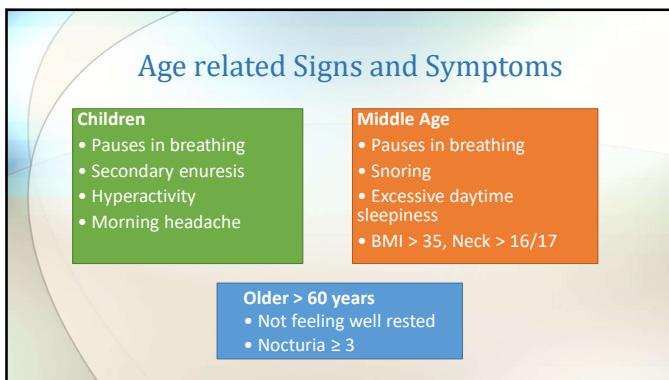
1. Has your snoring/breathing at night bothered others or yourself?
2. Do you feel excessively tired during the day or fall asleep easily?
3. Have you been told you stop breathing or choke while sleeping?
4. Do you have hypertension or type 2 diabetes?

If two or more responses are yes then assess with any of these tools:
Berlin Questionnaire, Epworth Sleepiness Scale score, BMI, neck size measurement

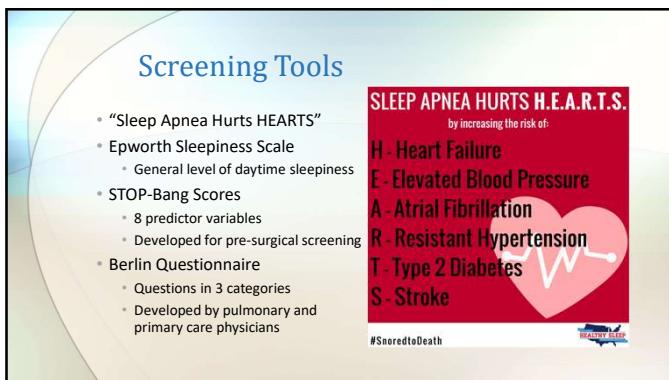
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Physical Exam Findings

- Oropharyngeal crowding/ small posterior pharynx
 - Mallampati score
 - Tonsillar enlargement
 - Enlarged, long or swollen uvula
 - Macroglossia
- Neck collar size
- Craniofacial Abnormalities
- Nasal passage abnormalities
 - Deviated septum, enlarged turbinates, polyp
- Signs of right heart failure/strain
 - Edema, JVD

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Examples of Exam Findings

Mallampati Classification:

- CLASS I:** Hard and soft palate, upper portion of tonsils and uvula visible.
- CLASS II:** Soft palate and tonsils visible.
- CLASS III:** Only uvula visible.
- CLASS IV:** None of the structures visible.

Labels: Uvula, Hard palate, Soft palate, Pillars.

Definition and Pathophysiology

What to look for in Upper airway:

- Retrostethitis
- Retropharynx

Crowded Upper Airway

Symptoms: Snoring, Snorting, and Gasping

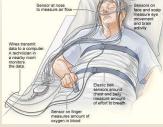
Larynx: Sleep Apnea

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Case continues

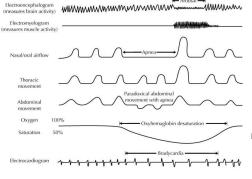
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Now You Plan to Refer What Will We Do?

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| <p>Polysomnogram (PSG)</p> <ul style="list-style-type: none"> Recommended if comorbid conditions or suspicion of other sleep disorders More data obtained More expensive  | <p>Home Sleep Apnea Test (HSAT)</p> <ul style="list-style-type: none"> Recommended if high pretest probability of OSA in a symptomatic patient Less data obtained Cheaper |
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What Sleep Providers Are Looking For

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| <p>PSG</p>  | <p>Scoring</p> <p>AHI = (# apneas + # hypopneas) / sleep hours</p> <ul style="list-style-type: none"> AHI < 5 normal AHI 5 – 15 mild AHI 15 – 30 moderate AHI > 30 severe <p>RDI = (# apneas + # hypopneas + # RERAs) / sleep hours</p> <ul style="list-style-type: none"> Can be large difference in AHI vs RDI in young, thin patient who is less likely to desaturate by 4% with events Treatment not covered by Medicare if AHI < 5 but some insurances accept RDI > 5 (with AHI < 5) with symptoms |
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Case Study: Sleep Lab Results

The sleep study report is as follows:

- SLEEP ARCHITECTURE:** (frontal, central and occipital EEG, right and left EOG and digastric EMG) The exam started at 22:17 and ended at 05:39. Sleep latency was 10 minutes, and REM Latency was 85 minutes. Total sleep time was 404.3 minutes with a sleep efficiency of 91.5 %. The sleep stage distribution showed stage N1 (16.7%), stage N2 (67.3%), stage N3 (0 %), and REM sleep (16 %). The total amount of wake after sleep onset (WASO) was 35.5 minutes and there were 236 arousals during the exam.
- RESPIRATION:** There were 295 respiratory events consisting of 35 obstructive apnea(s), 22 mixed apnea(s), 0 central apnea(s), 238 hypopneas and 0 respiratory effort-related arousals (RERAs). The AHI during REM sleep was 23.1. The average event duration was 27.3 seconds, and the maximum duration was 55.2 seconds. The supine and non-supine RDI were 75.3 and 41.2 respectively.
- OXYHEMOGLOBIN SATURATION:** (pulse oximetry with beat by beat sampling) Mean oxyhemoglobin saturation was 94.7%. Oxyhemoglobin saturation was below 88% for 2 minutes. The SaO₂ ranged from 86% to 99%. The patient was studied on room air.

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Treatment Options

- PAP (positive airway pressure)
 - CPAP
 - APAP
 - BiPAP
- Oral appliance therapy
- Surgery
- Upper airway stimulation
- Weight Management
- Positional Therapy
- Cognitive Behavioral Therapy

Oral Appliance Therapy
The first and most comfortable option to CPAP for the treatment of obstructive sleep apnea.

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Pap Mask Types

- Nasal mask
- Nasal pillows mask
- Full-face mask
- hybrid mask
- Oral mask
- Total face mask

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| Nasal Pillows | Nasal | Full Face | Hybrid | Oral |
| <ul style="list-style-type: none"> - small profile - minimal headgear - nasal delivery - least intrusive | <ul style="list-style-type: none"> - small facial profile - nasal delivery - best patient compliance record | <ul style="list-style-type: none"> - supports congestion - nasal/oral delivery | <ul style="list-style-type: none"> - avoids forehead - avoids nose bridge - nasal/oral delivery | <ul style="list-style-type: none"> - minimal facial contact - minimal headgear - oral delivery |

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Case Study: Treatment

- After some discussion, SA accepts the recommendations and opts for CPAP therapy. You arrange for in-lab CPAP titration and after reviewing the results, you prescribe CPAP at 12 cmH₂O

DIFFERENT TYPES OF CPAP MACHINES

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Case Study: Follow up

- SA returns after 3 months of cpap use and reports improvement in daytime hypersomnolence. He has been paying attention to his diet and has been exercising more with a 10 lb. weight loss. He wonders whether he still needs CPAP.
- He reports nightly use of at least 5 hours with initial difficulty tolerating the mask but gradual increase in tolerance. He uses a humidifier and that has helped somewhat.

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Sleep and Why It is Important

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Sleep Recommendations

- Adequate Duration
 - Average adult 7 or more hours per 24 hours
 - Healthy People 2030
- Create a schedule that prioritizes regular, sufficient sleep
- “buffer” before bed
- Reserve your bed for sleep
- Avoid alcohol and excessive caffeine
- Make your sleep space a sanctuary
- Stay active and head outdoors if possible

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Tips for Healthcare Workers:
Prioritize sleep and seek help for any sleep problems

- Bank sleep on days off
- Use caffeine strategically
- Nap strategically
- Use bright light, especially on the night shift
- Take an activity break or micro break
- Use checklist and communicate with your team