Obstructive Sleep Apnea (OSA) and Insomnia for Primary Care

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Overview

- Sleep differential diagnosis
- OSA: the disease, diagnosis and treatment
- Medical and economic consequences of untreated OSA
- HSAT is preferable to sleep center for most patients
- Insomnia Basics
- CBTi treatment
- New frontiers
Sleep Evaluation

- Symptoms of Fatigue vs Sleepiness
- Epworth Sleepiness Scale
- Insomnia: duration, onset, sequelae
- Sleep History: weekday vs weekend
- Sleep Hygiene
- Sleep behaviors: snoring, movement, awakening, nightmares
- RLS: Occurs before sleep onset.
Sleepiness vs Fatigue

- **Sleepiness**: The urge to sleep or involuntary onset of sleep during normal wake periods.
  - Insufficient sleep syndrome most common cause. Seven hours is adult requirement, which may not be enough for some.
  - If sleepiness is present despite sufficient opportunity to sleep, consider a sleep disorder.

- **Fatigue**: The perception of a lack of sufficient energy to accomplish daily tasks:
  - “I’m tired”
  - Obesity, depression, lack of physical activity, social isolation
  - Often **not** sleepy
EPWORTH SLEEPINESS SCALE FORM

Instructions: Be as truthful as possible. Print the form. Read the situation in the first column; select your response from the second column, enter that number in the third column. Total all of the entries in the third column and enter the total in the last box.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Responses</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and Reading</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = slight chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>Watching Television</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = slight chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>Sitting inactive in a public place, for example,</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td>a theater or a meeting</td>
<td>1 = slight chance of dozing</td>
<td></td>
</tr>
<tr>
<td>As a passenger in a car for an hour without a</td>
<td>2 = moderate chance of dozing</td>
<td></td>
</tr>
<tr>
<td>break</td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>Lying down to rest in the afternoon</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = slight chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
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<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = slight chance of dozing</td>
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<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
<td></td>
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<tr>
<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after lunch when you’ve had no</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td>alcohol</td>
<td>1 = slight chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
<td></td>
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<tr>
<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
<tr>
<td>In a car while stopped in traffic</td>
<td>0 = would never doze</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 = slight chance of dozing</td>
<td></td>
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<tr>
<td></td>
<td>2 = moderate chance of dozing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 = high chance of dozing</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE**

A score of 10 or greater indicates a possible sleep disorder. Take the completed form to your doctor.

Score

0-5 normal

5-9 borderline

10-24 pathological sleepiness
What is Obstructive Sleep Apnea (OSA)?

- Upper airway obstruction during sleep usually associated with loud snoring and decreased oxygenation.
- With sleep onset muscles in the back of the throat relax, subjecting the area to negative pressure from breathing and collapse of the airway.
- Patients stop breathing during sleep for 10 seconds or longer (apnea) and this may occur up to 100 or more times each night, stressing the cardiovascular system through activation of sympathetic system.

Sleep apnea is a serious, potentially life-threatening condition.

Sleep stages affect degree of obstruction.
Components of the upper airway

- Nose
- Nasopharynx
- Oropharynx
- Laryngopharynx
- Larynx
1) Repetitive arousals destroy normal sleep cycles leading to symptoms of sleep deprivation: impaired memory, sleepiness, lethargy, decreased executive function, irritability, depression

2) For years OSA was considered a sleep disorder but the repetitive hypoxia at night leads to multiple medical issues as a result of hypoxia and over expression of sympathetic nervous system

3) Diagnosis requires the presence of clinical symptoms PLUS physiologic confirmation (sleep apnea testing)
Severe health risks associated with OSA

- OSA is present in...
  - 30% of patients with hypertension
  - 48% of patients with type II diabetes
  - 77% of patients with obesity
  - 49% of patients with atrial fibrillation
  - 30% of patients with cardiovascular disease

- OSA is an independent risk factor for arterial hypertension and is associated with an increased prevalence of hypertension

- While OSA is prevalent with type 2 diabetes, patients without type 2 diabetes are also at increased risk of developing insulin resistance and diabetes

- Patients with OSA are two times as likely to develop a depressive disorder than patients without OSA

References:
OSA signs and symptoms

- Awakening with choking
- Hypertension
- Intense snoring
- Large neck circumference (>17” men, >16” women)
- Male gender
- Obesity (common but only 66% are overweight)
- Reported apneas or choking by sleep partner
- Legs or arms jerk often during sleep
- Atrial fibrillation, morning headaches
- Excessive daytime sleepiness (kids & adults), fatigue more common in women
Most OSA patients are NOT diagnosed
OSA prevalence in general population

- 1 in 15 has moderate to severe OSA  
  *T Young 2004*

- **9%** women & **24%** men in the middle-aged working population have OSA  
  *T Young 1993*

- Medicare population: **70%** of men and **56%** of women between the ages of 65 to 99 years have moderate to severe OSA

- ~**85%** not diagnosed  
  *T Young 1997*
The cost of untreated OSA

- Millions of Americans have undiagnosed OSA

- Union Pacific Rail Union saved $2411/treated OSA member in health care costs in 2008\(^1\)

- These medical savings have been confirmed in multiple other studies.

- Increased care for OSA is a multi-billion dollar opportunity

Technological Changes in OSA Care

- Key developments have made it possible for OSA management to move from sleep specialist to Primary Care
- Home Sleep Apnea Testing (HSAT) 1988
- Automatic, continuously adjusting PAP therapy 2000s (APAP)
- Randomized controlled trials\(^2,3\) have shown non-inferiority of HSAT followed by APAP when compared to sleep lab model.
- HSAT followed by APAP can be managed successfully by Primary Care in up to 80% of patients.


\(^3\) Berry, R.B. and Sriram, P., 2014. Auto-adjusting positive airway pressure treatment for sleep apnea diagnosed by home sleep testing. *Journal of Clinical Sleep Medicine, 10*(12), pp.1269-1275.
Apnea & Hypopnea Index (AHI aka RDI/REI)

The Physiologic measure used to diagnose Obstructive Sleep Apnea

- **Apnea (Obstructive and Central)**
  - Cessation of airflow $> 10$ seconds

- **Hypopnea**
  - Decreased airflow plus a decrease in oxygen levels $> 10$ seconds

- **Apnea Hypopnea Index (AHI) (aka RDI and REI)**
  - # apneas + hypopneas per hour of sleep (or testing)
OSA is an unacceptable risk

- Double the healthcare costs *Kapur 1999, Kryger 1996, Peker 1997*

- Double the risk of stroke and 75% increase in early death *Yaggi 2005, Sahlin 2008*

- Increased risk of fatal and non-fatal cardiovascular events *Marin 2005*

- An independent risk factor for hypertension, stroke and cardiovascular disease *Drager 2007, Doherty 2005, Yaggi 2005*

- 6 times higher the risk of vehicle accidents *Teran-Santos 1999*

- With CPAP treatment, most OSA related risks, costs and death can be prevented *George 1996, Nietro 2000, Marin 2005, Drager 2007, Doherty 2005*
CPAP therapy is the treatment of choice

- Machine uses air pressure in the throat so that airway does not collapse when breathing in

- Highly effective when used regularly

- Adherence levels 2016 of 80% if managed well
Different types of CPAP machines available

- **APAP** – newest machine continuously monitors breathing and adjusts the pressure to compensate for breathing variation throughout the night

- **CPAP\Bipap** – first generation produces constant pressure to keep the airways open (titration required)
Primary Care and OSA

- Primary Care is better than Specialist care for common conditions
- They are already by default tasked with recognizing OSA and long term care of OSA
- OSA is a chronic medical condition with multiple co-morbidities, sleepiness is but one symptom
- Technology accessible to Primary Care will make it possible to manage most OSA, needing sleep specialist only to interpret HSAT in majority of cases
Diagnosis of OSA

- Indications for HSAT
  - History of snoring, witnessed apneas, spontaneous awakenings.
  - Symptoms of excessive sleepiness despite the adequate opportunity to sleep
  - Absence of insomnia, neurologic disease or severe COPD/CHF (NYHA III or IV)
  - Morning headaches, hypertension, diabetes, pre-diabetes, microalbuminuria, nocturia, GERD.
  - Obesity (2/3) although normal BMI and female gender should not be overlooked
Obstructive Sleep Apnea diagnosis by HSAT is definitive.
Mild OSA: PAP, oral appliance, positional therapy, rarely surgery.

Moderate to severe OSA: AutoPAP
- Rx AutoPAP 4-20cm with heated humidity
- Nasal mask (not pillows or full face)
- Distilled H2O (<$1 gallon)
- Use it all night, every night
- Downloads provided by DME show usage, mask leak
- If patients c/o difficulty breathing at startup, increase minimum pressure to 8 cm.
- Major complaint is mask fit NOT pressure.
What if test is normal?

- Reassess patient
  - Sleepy vs fatigue
  - Sleep diary

- Retest if sleepy (home vs center)

- Multi-night testing in home most cost effective and reduces significantly the risk of re-testing.
Primary Care and OSA

- Pathway of HSAT to Auto-Pap has been validated.\(^1\)
  - Randomized trial of HSAT followed by Auto vs. in lab test and titration. Outcomes the same*.

- Primary Care has been shown to be capable of managing OSA\(^2\)

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Insomnia

- Three categories: Acute, chronic, other
- Chronic insomnia (10% of population)
  - Difficulty initiating, maintaining sleep or early awakening
  - Daytime symptoms associated
    - Malaise, fatigue, sleepiness*, headache, memory issues
  - At least 3 times a week for 3 months
  - Opportunity for adequate sleep is available
  - Not better explained by another condition
    - Depression, OSA
Insomnia clinical phenotypes

- Psychophysiologic insomnia: 3 Ps
  - Idiopathic insomnia
    - Longstanding complaints beginning in infancy or early childhood
  - Paradoxical insomnia
    - Sleep state misperception
  - Inadequate sleep hygiene
    - Sleep is a behavior, bad behavior = bad sleep
  - Behavioral Insomnia of childhood
Psychophysiologic Insomnia: 3 Ps model

- Predisposing factors: Family history, anxiety, prior bouts
- Precipitating event: usually began with an event causing acute sleep loss. 60% can identify a specific event.
  - family, work/school and health
- Perpetuating: Behaviors to correct the insomnia and fear over lack of sleep actually drive the insomnia, long after the precipitating event has resolved. Excessive time in bed relative to sleep time.
- Coppola’s law: Everything the patient is doing to treat the insomnia is making it worse.
- Patients typically sleep better away from home!
Stimulus control: Keep it dark, cool and quiet
Bed is for sex and sleep ONLY
Don’t go to bed until you are ready to sleep and never go to bed early.
No digital clock in bedroom, if you awaken in the middle of the night, don’t check the time, your email or sports scores.
In hour before sleep time engage in restful activities avoid bright light. Warm bath/shower.
Avoid napping, stimulants and alcohol within 4 hours of bedtime.
Non-pharmacologic treatment of insomnia

- Every study has shown that non-pharma Rx is more effective and more enduring than pharma.
- Cornerstone of therapy is CBTi
- Cognitive behavioral therapy for insomnia (CBTi) includes cognitive therapy, stimulus control, sleep restriction, sleep hygiene and relaxation training.
- Web based individual CBTi has been shown to be as effective as in person CBTi
New approaches to Insomnia

- Although routine in center sleep testing is not indicated for diagnosis of insomnia or RLS, in home overnight EEG with sleep staging may have a role to play in identifying insomnia phenotypes particularly paradoxical insomnia.

- EBB new non-pharmacological Rx of insomnia
Time for a new approach