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Guideline to Sleep Disorder Consultation

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Abstract

Is it because of a sleep disorder? Due to the increasing complaints of sleep-related issues and the severe consequences untreated sleep disorders may cause, it is imperative to know how to identify sleep disorders and when to consult a sleep specialist. On average there are 50-70 million adults in the United States that have sleep-related disorders.[1] There are several sleep disorders, but the most common are Insomnia and Sleep Disordered Breathing, (Apnea / Hypopnea). The prevalence of common sleep disorders are, Insomnia 10-30%; Sleep Apnea 5%; Restless Leg Syndrome (RLS) 10% and Narcolepsy 0.05%. Most commonly diagnosed disorders of a patient that presented to the sleep center are Sleep Apnea 67.8%, RLS 4.9%, and Narcolepsy 3.2%. [2] Sleep Disorders have a significant impact on health and quality of life. Primary Care Providers have an enormous task of seeing patients on a minimal schedule and require tools to facilitate quick and accurate evaluations of sleep issues. It is essential to know how to screen for sleep issues and when and where to refer patients for further assessment and treatment. Sleep disorders have the propensity to create and or exacerbate disorders such as mental health issues, hypertension, Kidney disorders, and cardiovascular disease, thereby increasing morbidity, and mortality.

Keywords: Clinical guidelines, Obstructive Sleep Apnea, Insomnia, Sleep disorders, Sleep-disordered breathing (SDB), positive airway pressure, sleep study and sleep consults, STOP-Bang, Epworth Sleepiness Scale (ESS), assessment, Berlin questionnaire, Cardiovascular Disease

Guideline to Sleep Disorder Consultation

There is increasing recognition of the prevalence of sleep disorders and the impact on patients and public health. Sleep disturbances, either difficulty falling asleep, problems staying asleep or excessive daytime sleepiness, affect an estimated 35% to 40% of the adult population in the United States.[3] The American Academy of Sleep Medicine (AASM) recommends that screening for sleep disorders be included in routine health evaluations.[4] While this may be an admirable endeavor, it can be difficult and time-consuming, decreasing the quality of care provided.

SLEEP DISORDERS

The most common sleep disorders are Insomnia and Sleep Apnea, which we will focus on during the rest of this article. Insomnia is defined by the inability to fall asleep, difficulty staying asleep, waking up earlier than desired or unrefreshed sleep.[5] Insomnia can be attributed to several things such as consuming too much caffeine, eating too close to bedtime, exercising to close to bedtime and just poor sleep hygiene. The author notes from experience insomnia have been caused by mental health issues such as anxiety, depression, and Post Traumatic Stress Disorders. Insomnia is the most difficult sleep disorder to treat, as many pharmacological treatments for mental health disorders cause insomnia. Primary Care Providers (PCP), must work closely with a behavioral health specialist to this disorder.

Sleep Apnea consists mainly of two subtypes, Obstructive and Central. Obstructive Sleep Apnea (OSA) is often described by symptoms of loud snoring, awakening due to gasping or choking during sleep, and witnessed interruptions in/stopping breathing while sleeping.[4] There are no apparent symptoms with Central Sleep Apnea (CSA) as one would note in OSA because CSA starts in the brain. In CSA there is an interruption in the signals sent from the pontomedullary (the junction of pons and medulla oblongata) to the site that stimulates the muscles (diaphragm, thorax, and abdomen) for respiration, loss of the signal results in apneic episodes.[6] The cyclic pattern of intermittent hypoxia-reoxygenation increases inspiratory effort and activation of the sympathetic nervous system throughout sleep phase. The activation of the sympathetic nervous system produces vasoconstriction and efflux in the blood pressure that impacts vital organs, to include contributing to heart disease/Left Ventricular Hypertrophy (LVH), Chronic Kidney Disease (CKD) / End Stage Renal Disorder (ESRD).[7,8]

A side note concerning other sleep disorders, that will not be expanded on but the reader should be aware of. Narcolepsy is a sleep disorder characterized by excessive daytime sleepiness, cataplexy, sleep paralysis, and hypnagogic hallucinations, a Multiple Sleep Latency Test (MSLT) is recommended in this situation to confirm this diagnosis. Restless Leg Syndrome (RLS) is characterized by the overwhelming desire to move legs or sensation of something is crawling on the patient. Period Leg Movements (PLM) disorder described as episodes of insistent limb movements that mostly occurs during sleep.[9]

Screening

Obtaining a thorough history will help determine which direction to proceed when considering consultation and or treatment for a patient with sleep disorders. Providers outside of Pulmonary and Sleep medicine have the daunting task of trying to figure out when a patient requires evaluation for sleep disorders. The consideration that a patient may have a sleep disorder usually occurs after treatment for some other disorders has failed. There are several tools to assist providers in screening, but most are time-consuming and have questionable reliability.

There are several screening questionnaires available that have been evaluated for appropriateness of use in Primary care: Sleep Apnea of Sleep Disordered Questionnaire (SA-SDQ) (seldom used), the Berlin Questionnaire, the STOP-BANG questionnaire, STOP questionnaire (rarely used) and the Epworth Sleepiness Scale (ESS). A meta-analysis comparing, the summary sensitivity, specificity and diagnostic ratio of the screening questionnaires found the STOP-BANG questionnaire to be more accurate in detecting OSA, with both higher sensitivity and diagnostic odds ratio for detecting obstructive sleep apnea.[10] In the past, the most widely used questionnaires were the Pittsburgh Sleep Quality Index (PSQI) (rarely used today) and the ESS. They were initially designed to measure sleep quality and subjective daytime sleepiness, respectively, but they were not intended to screen for a specific sleep disorder.[11] The most frequently used tool the ESS was developed in 1991 using data from healthy subjects and patients with a variety of sleep disorders to describe the general level of daytime sleepiness, and most commonly used in sleep research and clinical settings. The Epworth Sleepiness Scale questionnaire consists of eight questions total of twenty-four points, points above 10 indicate excessive daytime sleepiness, 0-5 Lower Normal Daytime Sleepiness, 6-10 Higher Normal Daytime Sleepiness, 11-12 Mild Excessive Daytime Sleepiness, 13-15 Moderate Excessive Daytime Sleepiness and 16-24 Severe Excessive Daytime Sleepiness.

Table 1

Epworth Sleepiness Scale

Name: _____ Today's date: _____

Your age (Yrs): _____ Your sex (Male = M, Female = F): _____

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired?

This refers to your usual way of life in recent times.

Even if you haven't done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the **most appropriate number** for each situation:

0 = would **never** doze
1 = **slight chance** of dozing
2 = **moderate chance** of dozing
3 = **high chance** of dozing

It is important that you answer each question as best you can.

Situation	**Chance of Dozing (0-3)**
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. a theatre or a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in the traffic	

THANK YOU FOR YOUR COOPERATION

The internal consistency of ESS (Cronbach's alpha ranged from 0.7 to 0.9) suggested that this instrument can be used for group level comparison, but does not recommend using it for individual comparison[12] Rosenthal (2008) study indicated that the ESS had low sensitivity (66%) in identifying the apnea-hypopnea index suggestive obstructive sleep apnea.[13]

The STOP-BANG and Berlin questionnaire where found to be more accurate at predicting the presence of moderate to severe obstructive sleep apnea.[14] The Berlin questionnaire consists of 10 question, and the scoring is much more involved than with the ESS and STOP-BANG. A study of the Berlin and STOP-BANG questionnaire for the prevalence of OSA indicating positive and negative predictive values showed a prevalence for OSA was 83% using the apnea-hypopnea index (AHI) of AHI $\geq$ 5/h and 58.4% for AHI $\geq$ 15/h. The STOP-BANG questionnaire had a high sensitivity (97% for AHI $\geq$ 5/h, 98% $\geq$ 15/h), but the specificity was low (19% and 11% respectively).[15] No statistically different sensitivity and specificity were found between the Berlin and STOP-BANG questionnaires. The STOP-BANG was created by an anesthesiologist as a clinical instrument to rule out OSA in lower-to-average risk population.[4] The scoring for STOP-BANG, yes to 0-2 questions indicate low risk of OSA, 3-4 questions indicate Intermediate risk and yes to 5-8 questions suggest High risk. The STOP alone has been validated in preoperative surgical patients yielding a sensitivity of 65%. STOP = Snoring, Tiredness, Observed apnea, high blood Pressure; BANG = BMI greater than 35, Age older than 50, Neck circumference greater than 17 inches (43cm), Gender male and 16 inches (41cm) female (see Appendix 2). Men are thought to suffer from OSA more than women; however, scores for men using the STOP-BANG were found to be inflated, possibly resulting in more being sent for follow-up testing.[4] When considering screening questionnaires the Epworth Sleepiness Scale and STOP-Bang will provide sufficient information and save the crucial time needed to complete an initial exam. Screening questionnaires are considered very subjective, but yet they remain effective as part of the initial screening.

Table 2

STOP-Bang Questionnaire	
Snoring	Do you snore loudly (louder than talking or loud enough to be heard through dosed doors)?
Tired	Do you often feel tired, fatigued,or sleepy during the daytime?
Observed apnea	Has anyone observed you stop breathing during your sleep?
Blood **P**ressure	Do you have or are you being treated for high blood pressure?
BMI	BMI more than 35 kg/m^2?
Age	Age over 50 years old?
Neck Circumference	Are you a male with a neck circumference greater than 17 inches, or a female with a neck circumference greater than 16 inches?
Gender	Are you a male?

Physical Exam

Obstructive Sleep Apnea disorder is closely associated with comorbid complications including cardiovascular disease such as cardiac arrhythmias, atrial fibrillation, bradyarrhythmia, and complex ventricular ectopy.[16] Obstructive Sleep Apnea remains undiagnosed in patients with cardiovascular disorders due to lack of consistent clinical predictors, weak to no screening performed in cardiology clinics and economic challenges associated with obtaining sleep studies. Several studies have shown that at least 50% of heart failure patients present with sleep breathing disorders, equally divided among OSA and CSA, systolic heart failure prevalence in patients with CSA is estimated at 21-37%. Recurring desaturation and associated arousals can cause induced catecholamine release, systemic inflammation and increases insulin resistance.[17] When performing a physical exam, it is important to note any abnormal heart sounds and signs of peripheral venous insufficiency.

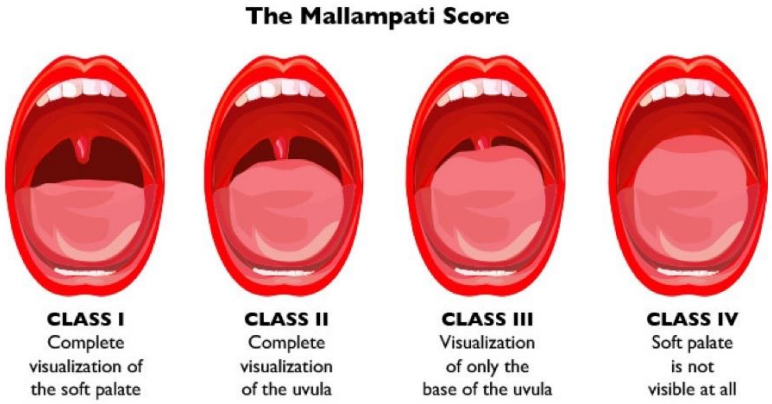
As stated previously in the STOP-BANG screening questionnaire Body Mass Index (BMI) and neck size play a significant role in OSA. Being overweight and having a sizeable abdominal girth limits lung expansion and large neck size greater than 16-17 inches may obstruct due to the relaxation of the tissue during sleep collapsing on the airway. In addition to large neck and elevated body mass index, posterior chin position, known as retrognathia, reduces the distance and increase angles from the chin to the thyroid cartilage causing narrowing of the oropharyngeal opening.[18]

Figure 1

This patient demonstrates **structural abnormalities** which can lead to airway narrowing and sleep apnea. Note the presence of a thick neck and retrognathia. [19]

An oral examination is required to evaluate the size of the oral cavity. Using the Mallampati scoring system is an effective way to access the possible occlusion of the airway. Mallampati scoring is used by an anesthesiologist to determine the ease in which it would be to intubate a patient (see Appendix 3). Hypoxemia from a small or collapsed airway potentially contributes to the development of coronary artery disease.[20]

Table 3



Decision to Consult

Patients who have Insomnia often misunderstand their sleep and wake time and become overly worried about not getting to sleep. This behavior increases anxiety, which can induce insomnia, creating a revolving cycle of torment. Studies report there is about 22% to 67% co-occurrence of Chronic Insomnia and Obstructive Sleep Apnea; however the American Academy of Sleep Medicine does not recommend as a standard performing Polysomnography (PSG) for Insomnia.[21] The recommended initial therapy for Insomnia is Cognitive Behavioral Therapy for Insomnia (CBT-I), this therapy has also been known to increase the tolerance of PAP.[22,23] Hughes (2018) confers the military has linked chronic insomnia to increased risk of for incident mental health disorders and suicidal ideation and attempts.[24] Approximately 50% to 80% of adult patients with mental illness are said to have difficulty falling asleep and staying asleep. Other mental health disorders closely associated with sleep issues include depression 23%, substance abuse (Alcohol 7% and drug 4%).[25] Patients with a high prevalence of insomnia should be referred to Behavioral Health for evaluation and consideration of CBT-I. When there is additional suggestive physical anatomy and voiced symptomology for underlying sleep breathing disorder and additional consult should be submitted to Pulmonary/Sleep Medicine. As stated earlier PSG is not recommended for Insomnia, however performing a Home Sleep Apnea Test (HSAT) may be appropriate, the test most commonly uses parameters of oxygen saturation and heart rate.[26] Patients found to have low-to-moderate symptomology, and physical findings of OSA should also be considered for HSAT. The HSAT cost less than Polysomnography (PSG) and can be completed in the comfort of the patients home. When encountering a patient with moderate-to-severe symptomology and physical attributes consistent with OSA or CSA, consultation to Sleep Medicine for PSG is recommended. Polysomnography is an attended overnight study that monitors brain activity with EEG, eye movement, muscle activity, and heart rhythm. Other considerations for sleep evaluation by PSG are those in the occupations of Air

Traffic Control, Pilots, and Commercial Vehicle drivers. Crash risk increases by 50% for commercial drivers with untreated sleep apnea.[27] The quality of life is the extent to which one's life is comfortable and satisfying, having insomnia or OSA can significantly alter that. A cohort study on the quality of life of those with untreated sleep apnea compared to the general population found that patients with OSA have impaired physical and mental quality of life compared with the general population.[28]

Conclusion

Sleep disorders are associated with increased mortality and morbidity, and although there has been an increase in complaints of related symptoms, screening continues to fall short. Even with limited time, screening can be accomplished effectively with a good history, limited questionnaires and focused physical exam. The average time from initial assessment to referral ranges from a few weeks to 6 months; the earlier conditions are identified the sooner treatment can begin to improve patients quality of life.

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