

Screening and Diagnosis of Excessive Sleepiness: The Role of the Primary Care Physician

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According to the United States Surgeon General, chronic sleep loss and untreated sleep disorders profoundly impact the population and economy, affecting as many as 70 million Americans and resulting in an annual cost of \$15 billion in health care expenses and \$50 billion in lost productivity.¹ The problem appears to be growing; a recent report of the National Sleep Foundation shows an increasing number of adults are sleeping less than the recommended 8 hours per night, both during the week and on the weekends.²

Not surprisingly, patients suffering from excessive daytime sleepiness are commonly encountered in practice.³ Unfortunately, the problem is often not recognized by patients, says sleep expert Mary O'Malley, MD, PhD, because lack of sleep prevents people from correctly assessing their own functional level, even as they experience lapses in judgment and a decline in cognitive ability, motivation, and performance.⁴

As the first point of contact for most patients, the primary care physician plays an essential role in the detection, diagnosis, and treatment of sleep disorders. However, Paul Doghramji, MD, FAAFP, points out that most clinicians, especially primary care doctors, have very little knowledge about sleepiness in patients, primarily because it is not typically addressed in the medical school or postgraduate situation. "The symptom is a very crucial one, like chest pain, shortness of breath, abdominal pain, bleeding," Dr. Doghramji said, "but we just don't talk about it."

In this review, Dr. O'Malley and Dr. Doghramji discuss excessive sleepiness as a public health issue, its causes and clinical manifestations, patient evaluation, treatment options, and when to engage the help of a sleep specialist.

SECTION ONE: Overview of Sleep

Consequences of excessive sleepiness in the general public

The major cause of excessive sleepiness in this country is sleep loss, which Dr. O'Malley says can come in the form of either acute sleep deprivation, such as that experienced by shift workers, or, more commonly, chronic under sleeping.

"Most adults need eight hours of sleep and most adults get seven hours or less of sleep, so every hour or less that you actually get of your full night, it begins to accumulate," says Dr. O'Malley. Indeed, a recent study by Van Dongen and colleagues showed that lapses in behavioral alertness occurred after a cumulative sleep loss of 15.84 hours over 14 consecutive days.⁴ Furthermore, sleepiness ratings suggested that subjects were largely unaware of increasing cognitive deficits, which the researchers believe might explain a public assumption that the effects of chronic sleep restriction are benign.⁴

Dr. Doghramji agrees that the general public is guilty of chronic under sleeping by volition, due to a belief that time which should be dedicated to sleep can instead be spent on other tasks. "Sleepiness is supposed to happen. It's a normal symptom, like hunger," he says. "But sleepiness, when it's occurring at any time other than right before bedtime, is inappropriate."

The implications of excessive sleepiness are far-reaching, reports Dr. O'Malley, impacting work, social interactions, family life, and perhaps most importantly, the physical safety of the person suffering from sleepiness and others.³ She points out that carrying a burden of sleepiness has, in shift workers, historically been the source of industrial accidents. "Think Chernobyl, think Exxon-Valdez," she says. "This is sort of a silent and slow death for people's productivity, because they don't see it coming."

Both Dr. Doghramji and Dr. O'Malley agree that as the main point person in today's health care system, the primary care physician has a critical role in the detection of excessive sleepiness. "I think that it's really important that the primary care physician know about sleep disorders and the impact they'll have, because the American Academy of Sleep Medicine has recently developed guidelines that call for the assessment of sleep quality during routine health evaluations," Dr. O'Malley reports. "Really, this means that assessing sleep as part of the general health screening for adults, and I would say children as well, is huge."

Causes of Excessive Sleepiness

According to Dr. O'Malley, the causes of excessive sleepiness are multi-fold, attributable to under sleeping, an underlying sleep disorder, or another intervening factor, such as a medication or other disorder that imposes extra sleepiness. Populations particularly at risk tend to be people whose sleep is out of alignment with the circadian rhythm, including shift workers, medical staff, transportation workers, and others with jobs that require behavior which directly conflicts with the natural drive to sleep at night.⁵

Another example of this, explains Dr. O'Malley, occurs in teens. "Adolescents go through a shift in their development where they need extra sleep, they need between 9 and 10 hours a night, and their circadian rhythm is delayed by about an hour or so," she says. "It's harder for them to fall asleep by 10 or 11 o'clock; their body wants to go to bed at later times and get up later. But our society has largely asked high schoolers to get up very early, so there is a cause where their sleep is going to necessarily be curtailed in order to make it to school. And that restriction continues to accumulate over time and it causes extreme levels of sleepiness in lots of kids."

Over the counter medications, such commonly taken to treat allergies, and prescription medications also commonly interfere with natural states of alertness or sleepiness, says Dr. Doghramji. Daytime drowsiness is also associated with brain-related disorders such as stroke, narcolepsy, multiple sclerosis, or Parkinson's disease.⁵

"All these things, which are front part of the brain not functioning as well, are going to manifest themselves as excessive sleepiness," says Dr. Doghramji. "But the most important thing to remember is that all these people have the same specific symptoms of drowsiness." These symptoms, he says, include feeling tired, sluggish, irritable, and being unable to concentrate, multitask, exercise imagination, and adequately perform cognitive functions.

Dr. O'Malley also reports sleepiness as an issue during psychiatric illness, although she contends that the idea of sleepiness as a part of depression as a misnomer. "Primary care doctors may have the approach that if someone complains of being tired, their first thought is that maybe they are depressed," says Dr. O'Malley. "And that's a critical decision point because what they need to think about is, is this patient fatigued or are they sleepy? Because, as it turns out, the majority of people who have depression are not excessively sleepy. But they may desire to go to bed to retreat from the world."

Another significant cause of excessive sleepiness is obstructive sleep apnea, which has an estimated prevalence of 9% in women and 24% in men.⁶ Somewhat less common is restless legs syndrome, unpleasant feelings in the legs that create the desire to move at night, which occurs in 11% of women and 8% of men.⁷

SECTION TWO: Clinical Manifestations, Diagnosis, and Treatment

Clinical manifestations

Excessive sleepiness is associated with medical conditions that pose significant health threats, such as cardiovascular disease, stroke, hypertension, gastrointestinal disturbances, diabetes, and obesity, reports Dr. Doghramji.

For example, the cardiovascular morbidity and mortality associated with obstructive sleep apnea is huge, says Dr. O'Malley.⁶ "We know now the reason is that obstructive sleep apnea causes hypertension, it causes cardiovascular disease, and therefore can lead to stroke and lead to MI," she says. "Essentially, the body is doing such extra work - every time you stop breathing, your oxygen drops and that whole event triggers an awakening with a surge of adrenaline - that instead of getting rest at night and being able to recuperate, your body is running a marathon."

Additionally, sleep apnea appears to have metabolic consequences, which over time, result in a shift toward insulin resistance and, eventually, diabetes, according to Dr. Doghramji. "They also have, oddly enough, a higher rate of peptic ulcer disease," he adds.

Shift workers are another population with an erosion of health directly related to the underlying sleep disorder. As in obstructive sleep apnea, sleep deprivation places shift workers at higher risk of GI disturbances, especially peptic ulcer, cardiovascular disease, diabetes, and even compromised pregnancy outcome.⁸

What shift workers are ultimately enduring, says Dr. O'Malley, is a constant, chronic jet lag. "What many people may not appreciate is that we know we have a circadian rhythm that governs sleep, but that same circadian rhythm governs all of our bodies, all of our physiology, and metabolism," she explains. Even when shift workers manage to get quality sleep, she says, the duration of tends to be shorter. The cumulative effect of sleep deprivation over time eventually places them at risk for significant medical disorders.

Likewise, shifts in metabolism toward weight gain and glucose intolerance are associated with restless legs syndrome, says Dr. O'Malley. "The downstream effects of poor sleep can be big, can be very big, and the primary care physician who may be chasing after the obesity or the diabetes or the hypertension, may not realize that the underlying reason is that they have a sleep disorder," she says.

Diagnosis

The role of the primary care physician in the diagnosis and treatment of excessive sleepiness is obvious, says Dr. Doghramji, as patients are likely to present to those practitioners before seeking medical care from any other specialist. The symptoms reported, he says, are often vague and unusual, such as *I don't have energy, I feel like I'm in a fog, or I want you to check my thyroid*. These types of statement may be indicative of excessive sleepiness, and warrant further investigation.

The key here is to realize that the patients themselves may not be aware of excessive sleepiness as a possible cause of their symptoms, advises Dr. O'Malley. Ask questions using clinically specific terms, such as sleepiness or fatigue. "When patients have complaints of anxiety or depression, that may get all the focus," she says. "But if in the mix with that you hear that there may be sleepiness, then you may be finding the root cause."

According to Dr. Doghramji, the main question which should be answered is whether the patient becomes drowsy in passive situations, such as waiting for a red light, watching TV, or sitting in a meeting. If the patient indicates this is the case, further screening should be performed.

A tool highly recommended by both Dr. Doghramji and Dr. O'Malley is the Epworth Sleepiness Scale, in which patients are asked to rate their chance of sleeping in 8 typical scenarios.⁹ The test is self-administered and produces quantifiable results for patient feedback.

[Insert screen shot of Epworth Sleepiness Scale here.]

Broader questionnaires assessing issues beyond sleepiness are also available, such as the Sleep Disorders Questionnaire¹⁰ and the Pittsburgh Sleep Quality Index.¹¹ However, because patients are often unaware of their symptoms, Dr. O'Malley recommends the additional use of sleep logs or diaries for the most accurate assessment.¹²

Treatment options

One of the easiest problems to address in patients experiencing sleep deprivation is sleep hygiene. The patient has to be educated in the importance of dedicated sleep time and an environment conducive to sleep. If the patient is taking medication that could interfere with sleep or alertness, Dr. Doghramji suggests that making adjustments may be helpful.

Shift workers, Dr. O'Malley says, should be educated on the role of light as an anchor for the circadian rhythm and take steps to protect their eyes from sunlight just before sleep time, such as wearing protective sun glasses during the drive home from work. This helps, she says, because the circadian rhythm functions not only by cuing the body for the sleep state, but also for being alert.

“And in the reverse, if we use light - bright light - at work, that can also increase wakefulness in the night time setting,” O'Malley says. Modafinil has also been shown to effectively improve alertness in shift work sleep disorder.^{13,14} In a 3 month, double-blind study by Czeisler and colleagues, treatment with 200 mg modafinil as compared to placebo prior to each shift resulted in improved psychomotor performance as measured by the Psychomotor Vigilance Test (a reduction in lapse frequency of 2.6 vs. an increase of 3.8, respectively; $P < 0.001$) and a reduction of almost half in accidents and near accidents while commuting home (29% vs. 54% respectively; $P < 0.001$).¹⁴ Modest improvement from baseline was observed in mean nighttime sleep latency (1.7+/-0.4 vs. 0.3+/-0.3 minutes, respectively; $P = 0.002$), and clinical symptoms improved in more patients (74% vs. 36%, respectively; $P < 0.001$).¹⁴ Headache as the most common side effect.¹⁴ Despite these benefits, excessive sleepiness and impaired night time performance were not completely curtailed.

Because of the significant safety improvement, Dr. O'Malley recommends using modafinil as a first-line treatment for shift work sleep disorder, in conjunction with sleep hygiene attenuation. The additional use of a hypnotic may facilitate sleep when necessary.

Other studies have been performed to assess the impact of sleep quality improvement on excessive sleepiness during waking hours. Zolpidem, a nonbenzodiazepine hypnotic, has been found to improve sleep quality and, to a lesser degree, next-day performance in shift workers; however, zolpidem appeared to negatively affect next-day mood, and the investigators concluded that the medication was not appropriate for short-term shift changes.¹⁵

A variety of drugs are available to treat restless legs syndrome, according to Dr. O'Malley. She recommends dopaminergic drugs, such as ropinirole, pramipexole, and levodopa as first-line therapy, cautioning that patients occasionally experience augmentation, a rebound effect that subjects patients to restlessness during the morning hours. Second line therapy would consist of an anticonvulsant, such as gabapentin, and opioids are can be effective when other alternatives fail, she says, and all treatment should be provided in consultation with a sleep specialist in case of underlying periodic limb movement disorder.

Pharmacologic Treatment Options for RLS^{16,17*}

- First-line therapy
 - Dopaminergic drugs (eg, ropinirole, pramipexole, levodopa)
- Alternative therapies
 - Benzodiazepines (eg, triazolam, zolpidem, zaleplon)
 - Opioids (eg, codeine)
 - Anticonvulsants (eg, gabapentin)*

When to Refer to a Sleep Specialist

“Certainly if a patient has had chronic, unremitting sleep complaints and you’ve done your best, and they’re still there, that’s an easy referral,” says Dr. O’Malley. Primary care physicians who suspect obstructive sleep apnea, narcolepsy, or disruptive sleep behaviors should also make a referral, as these conditions require overnight testing.

According to Dr. O’Malley, the sleep center performs many of the same assessments undertaken by primary care physicians, including collection of sleep history, medical history, psychiatric history, and performing a physical exam. Additional outpatient assessments may also be performed prior to overnight studies. When overnight testing is performed, daytime testing may follow to measure next-day sleepiness. The test, known as the multiple sleep latency test, reveals over the course of 4 to 5 daytime naps how much pressure is on the brain to fall asleep and what kind of sleep the patient gets.¹⁸

“If there is sleepiness and the brain produces an inappropriate onset into dream sleep, REM sleep –rapid eye movement sleep - those are the measures we use to define narcolepsy,” Dr. O’Malley says.

Patients with conditions such as narcolepsy or cataplexy are prescribed medications for their symptoms. Additional overnight testing is necessary for the diagnosis of obstructive sleep apnea in order to titrate a nasal CPAP, the gold standard for treating the disorder.

However, Dr. Doghramji cautions that in the case of obstructive sleep apnea, primary care physicians should be aware that residual sleepiness may continue after treatment. “The current statistics are about 20% or so of patients who are adequately treated for their apneic episodes will continue to have pathologic daytime sleepiness,” he warns. Primary care physicians should be alert to this and prepared to provide additional support such that patients can achieve the highest level of wakefulness possible.

Conclusion

Excessive sleepiness is gaining increasing recognition for its substantial burden on individuals, society, and the economy, and the role of primary care physicians in healthcare has been identified as essential for intervention.

“The American Academy of Sleep Medicine is calling for guidelines for primary care doctors to be more adept at identifying excessive sleepiness by specifically looking for patients that are at high risk,” says Dr. Doghramji. Primary care physicians should be able to identify the vague symptoms that suggest excessive sleepiness, and perform the research necessary for accurately determining if it is an issue, and if so, taking the appropriate steps to remediation.

“I want to emphasize that sleep physicians love to collaborate. And we view ourselves as consultants for these sort of patients,” Dr. O’Malley says. She recommends that primary care physicians who are not already working in conjunction with a sleep specialist use the American Academy of Sleep Medicine’s web site, www.aasmnet.org, to find accredited sleep centers in their area.

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