A Sleep Review of Systems: Evaluating the Effects of Medical Disorders on Sleep in the Older Patient

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Accessibility
A sleep review of systems
Evaluating the effects of medical disorders on sleep in the older patient
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Older adults often experience sleep disturbances, but most fail to mention these sleep problems to their physicians out of a false belief that sleep troubles are just a consequence of getting older. On the contrary, sleep complaints in older adults are often the result of medical or psychiatric illnesses that can be managed, resulting in a return to restful sleep. It is important for physicians and patients to communicate about sleep disturbances, and for physicians to ask appropriate questions targeted at identifying the underlying cause of the sleep problem, particularly in patients with chronic medical conditions.


Key words: sleep review of systems • insomnia • apnea • restless legs

Although sleep disturbances are common in older adults, they are not a normal part of aging. Sleep complaints may be secondary to health burdens such as medical and psychiatric illnesses, other types of primary sleep disorders, and maladaptive behaviors, including poor sleep habits (sleep hygiene). Sleep disturbances may be caused by a medical illness; treatments associated with the illness, such as medication, surgery, and bed rest; inactivity or lack of exercise; depression related to the primary illness; or a comorbid condition.

In addition to sleep disturbances caused by medical conditions, there are also primary sleep disorders. The most important of these is sleep-disordered breathing (ie, central and obstructive sleep apnea/hypopnea). However, other sleep disorders may occur in older adults, including restless legs syndrome (RLS) and periodic limb movement disorder; circadian rhythm disorders, the most common one being an advance of the sleep-wake cycle; and parasomnias, which are abnormal events that occur during sleep, such as nightmares, sleep-walking, and sleep terrors.

Sleep disturbances are associated with increased cardiovascular risk, poor health, depression, and decreased quality of life. Consequently, it is important for primary care physicians to identify sleep disturbances in their older patients. This requires open communication from the physician and patient as well as an evaluation for medical conditions that might be affecting the patient's sleep. This article presents a sleep review of systems that primary care physicians can use when assessing sleep disturbances in their older patients.

Communication is key
Lack of communication between physicians and patients regarding sleep issues is a central barrier to diagnosing and treating sleep-related illnesses—a sort of "don't tell, don't ask" dynamic.
Barrier 1—Don't tell. Most patients, especially older adults, do not seek treatment specifically for sleep problems, so they don’t tell their physicians about sleep complaints. Instead, they resign themselves to poor sleep or daytime fatigue and blame their sleep complaints on stress or aging because they assume that trouble sleeping is a normal part of getting older.

Patients are reluctant to discuss their sleep problems with their physicians because they believe that sleep problems are an inevitable part of aging and think that little can be done to improve their sleep. In fact, only one-third of adults with insomnia have mentioned their sleep complaints to a healthcare professional, and only 5% specifically sought treatment.1-3

Barrier 2—Don't ask. Physicians and health professionals do not typically ask about sleep issues because questioning a patient about sleep is not an integral part of the medical history taught in medical schools. A recent study highlighted the significance of this "don't tell, don't ask" dynamic.4 The study included an interview and chart review of approximately 1,500 older patients from primary care offices, in which patients were asked several questions regarding their sleep:

- Do you feel excessively sleepy during the day?
- Do you snore loudly or frequently, or stop breathing?
- Do you feel refreshed upon awakening?
- Do you have difficulty falling asleep, staying asleep, or being able to sleep?

During the interview, 70% of patients answered "yes" to at least one of the questions; 45% of patients said they had difficulty falling asleep or staying asleep; 33% said they snored; and 27% said they were excessively sleepy during the day. However, the chart review of these same patients revealed that the primary care physicians identified, or at least mentioned, a sleep problem in only 10.7% of their patients.

In this same population, the number and type of sleep problems predicted physical and mental health status as measured by the SF-12 quality of life questionnaire, and the question that best predicted health status was, "Do you feel excessively sleepy during the day?" Thus, a sleep history should be an integral part of a careful health assessment.

Sleep review of systems
Complaints of sleep disorders increase with age, and there appears to be an association between sleep disorders and various medical conditions. In some cases, the sleep disorder is the result of the chronic medical condition, and in other cases, the sleeping problem may cause or aggravate the medical condition. Therefore, a careful sleep review of systems must be conducted, with a patient interview targeted at identifying the medical or psychiatric illnesses that are contributing to the patient’s sleep disturbance. The goal of the sleep review of systems is to understand the causes of sleep disruption so that appropriate treatments can be prescribed. As a screening tool for sleep disorders, every older adult should be asked:

- Do you have difficulty falling asleep or staying asleep?
- Are you excessively sleepy during the day?

Cardiovascular disease and stroke.
The prevalence of coronary heart disease increases with age in men and women. Several studies demonstrate that patients with coronary heart disease have more complaints of disturbed sleep than patients without coronary heart disease.6-8 In relation to sleep, blood pressure decreases during the night, although this phenomenon is blunted in some older adults who have hypertension or congestive heart failure. Existing data show that this "non-dipping" effect is a risk factor for a subsequent cardiovascular disease event.9 Thus, sleep may have some influence on the timing of cardiovascular events, and the lack of physiologic changes associated with some circadian rhythms may contribute to an increased risk for cardiovascular events.

A Finnish study evaluated symptoms of sleep disturbance that were reported in the Nottingham Health Profile. The study included 189 male and 91 female patients (age range 35 to 74; mean ages 58.4 for men and 60.8 for women) with coronary heart disease (CHD) who were compared with a random population sample of 2,500 Finnish adult men and women. Researchers found a greater tendency to have symptoms of a sleep disturbance with CHD than without CHD, and a greater tendency for this to occur in those over age 65.

A separate study found that increased amounts of sleep-disordered breathing is associated with increased cardiovascular disease events.10 There also seems to be a relationship between sleep disturbances and stroke. One study demonstrated that hypersomnolence and insomnia are common after an acute stroke.11 Evidence suggests that people with frequent nocturnal awakenings have poorer outcomes after stroke.11 In addition, sleep-disordered breathing is common in the setting of acute stroke,12 and data suggests that patients with sleep-disordered breathing have poorer stroke outcomes and longer rehabilitation times than stroke patients who do not have sleep-disordered breathing.13 Treatment with nasal continuous positive airway pressure (CPAP) may be helpful in these patients, however, CPAP is not always well-tolerated after stroke.

When assessing a patient who has cardiovascular disease or stroke, sleep-related questions to ask include:
Do you experience shortness of breath when lying flat? (A yes answer might indicate congestive heart failure.)

Do you wake up at night with shortness of breath, chest pain, or chest tightness? (A yes answer might indicate coronary artery disease.)

To identify sleep-disordered breathing:

Do you snore or have breathing pauses during sleep?

Do you experience headaches (particularly upon awakening)?

Asthma and COPD. Asthma does not appear to increase in prevalence with age, and patients with asthma do not have more sleep symptoms than those without asthma. Nevertheless, asthma is a relapsing disease, and when patients experience an asthma attack, it has a significant impact on sleep. One study found that patients in asthma remission sleep much better than asthma patients who are not in remission. 14 Asthma attacks rarely occur during the first hour of sleep and are less frequent during the first one-third of the night. 14 Nocturnal awakenings and sleep-disordered breathing tend to occur, and are worse, during REM sleep in patients with asthma. 14, 15

In the Cardiovascular Health Study, adults over age 65 who had probable or definite asthma complained more of restless sleep than those without asthma. 16 In addition, those with asthma had a higher prevalence of being sleepy than those who did not have asthma. 17

Hypoxemia can occur during sleep in patients with chronic obstructive pulmonary disease (COPD). Many of these patients have severe nocturnal oxygen desaturation during REM sleep. 18 Although supplemental oxygen improves oxygenation and mortality in patients with COPD, a Swedish study found that oxygen does not appear to improve sleep disruption. 19 Patients with COPD tend to have cardiac arrhythmias at night that also may be related to oxygenation problems.

In data collected in The Sleep-Heart Health Study, forced expiratory volume in one second (FEV1), an indicator used to identify COPD in this cohort of 6,441 adults over age 40, showed a decreasing total sleep time and decreasing sleep efficiency with lower pulmonary function. 20 There was also a trend for an increasing number of arousals with decreasing pulmonary function. 20

Questions to ask when assessing sleep disturbances in patients with asthma or COPD include:

Do you awake during the night and at what time? (Timing is important because symptoms of asthma may occur in the early morning hours.)

Do you wake up during the night with shortness of breath, chest tightness, or cough? (These symptoms are often seen in asthma patients.)

What medications are you taking and at what times? (Steroids, for example, have a stimulatory effect that, when taken at night, can contribute to insomnia.)

Do you snore? (To identify underlying primary sleep disorders such as sleep apnea.)

Do you smoke?

Do you experience morning headache? (Might indicate nocturnal lack of oxygen, hypoxemia, or breathing excessive carbon dioxide during the night.)

GERD. Gastrointestinal disorders, gastroesophageal reflux disease (GERD), gastritis, and peptic ulcer disease can all contribute to or are associated with increased incidences of insomnia, sleep apnea, anemia, and RLS. 21 Although the incidence of GERD does not increase with age, GERD does have a negative impact on quality of life. 22

The prevalence of GERD is high in the U.S.—42.9% for men and 42.4% for women. 23 Research has shown that there is a statistically significant association between GERD and obstructive sleep apnea, daytime sleepiness, and insomnia, with increased odds of having GERD if one of these three conditions is present. 21

Questions to ask when evaluating sleep disturbances in patients with GERD include:

Do you have difficulty falling asleep, or do you wake up frequently during the night with heartburn? (To identify acid reflux-related arousals.)

Do you snore, choke, or stop...
breathing during sleep? (May indicate sleep-disordered breathing.)

- Are you excessively sleepy during the day? (May indicate obstructive sleep apnea and poor sleep quality.)

**Diabetes mellitus.** Diabetes is associated with obesity, and both conditions increase with age and can affect sleep. One study of 150 mildly obese (ie, average body mass index 30.5 kg/m²) men (age >45; mean, 58.7) found that sleep-disordered breathing might predispose them to developing diabetes. The researchers measured the patients' glucose levels and compared those levels with the patients' apnea hypopnea indices (AHI), which were used to determine the degree of sleep-disordered breathing. They found that glucose tolerance worsened as oxygen saturation decreased, and that increasing AHI was associated with worsening insulin resistance, independent of body mass index or weight. Data from another study showed that older patients with diabetes exhibited poor sleep quality. Taken together, this research suggests that there is a relationship between insulin resistance and sleep-disordered breathing.

Additional data from the Sleep-Heart Health Study demonstrates that patients with diabetes mellitus are more likely to exhibit sleep-disordered breathing, particularly periodicity and central apnea, than patients without diabetes. Thus, sleep-disordered breathing may be a risk factor for diabetes.

Questions to ask when evaluating a patient with diabetes or obesity include:

- Do you have difficulty falling asleep or staying asleep?
- Are you excessively sleepy during the day?
- Do you snore, wake up gasping for air, or have breathing pauses during sleep? (May indicate sleep-disordered breathing)
- Do you have uncomfortable, crawling, aching sensations in the legs at rest? (May indicate restless legs.)

**Renal disease.** In addition to diabetes and hypertension, age is a significant predictor of renal disease, and renal disease in older patients can contribute to disturbed sleep. Patients with renal disease frequently complain of hypersomnia or insomnia, have an increased prevalence of RLS and periodic limb movement disorder, and may also have an increased prevalence of sleep-disordered breathing.

In one study, patients undergoing hemodialysis reported more sleep complaints than a control group and exhibited diminished quality of life scores. Restless legs is commonly seen in patients with renal insufficiency and in association with dialysis, resulting in daytime fatigue and sleepiness.

Questions to ask the patient with renal disease include:

- Are you excessively sleepy during the day?
- Do you snore, choke, or have breathing pauses during sleep?
- Do you have uncomfortable sensations (ie, burning, aching, crawling) in the legs at rest that are more pronounced in the evening and are relieved by movement?
- Do you have difficulty falling asleep or staying asleep?
- Do you kick or have leg cramps? (All indicate RLS or periodic limb movements.

**Psychiatric disorders.** Sleep disturbances are common in patients with psychiatric disorders such as depression and anxiety. Depression and anxiety are strongly associated with insomnia and sleep apnea.

Primary care physicians can elicit more information to uncover a sleep disorder when evaluating a patient with a psychiatric illness by asking:

- Do you have trouble falling asleep, or staying asleep, or do you wake up early in the morning?
- Do you snore, choke, or stop breathing during sleep?
- Do you have difficulty staying awake, or do you experience excessive daytime sleepiness?
- Do you have early evening sleepiness and early morning awakening, regardless of sleep time?
- What medications or over-the-counter medications are you taking, and are you taking any herbal supplements?

**Neurologic or neurodegenerative disorders.** Sleep disturbances in patients with neurologic or neurodegenerative disorders are usually caused by multiple factors. A thorough sleep review of systems for these patients includes an assessment of associate medical and primary sleep disorders, psychiatric disorders, daytime behaviors, pain, and psychosocial support; and a review of medications and environmental conditions, especially in patients with Alzheimer's disease and Parkinson's disease. RLS and REM behavior disorder are often seen in association with Parkinson's disease.

It is also important to interview the caregiver to identify sleep disturbances such as snoring, gasping, choking, and episodes of stopped breathing.

Questions to ask the caregiver include:

- Does the patient kick or exhibit violent movement during sleep? (Will help identify restless legs, periodic limb movements, and REM behavior disorder, as well as other types of parasomnias.)
- What medications is the patient taking? (Will help identify use of benzodiazepine receptor agonists, GABA agonists, and dopaminergic and cholinergic medications. Dopamine 2 agonists can cause daytime sleepiness, but cholinergic agonists tend to be stimulating and can disrupt sleep.)
- Ask about the timing of the sleep-wake cycle and naps to uncover advanced sleep phase syndrome or other types of circadian rhythm abnormalities.

**Cancer.** Sleep disturbances and fatigue are common complaints in pa-
tients with cancer. Insomnia and sleep/wake cycle disorders may be secondary to biological and psychological factors associated with cancer and its treatments.

When evaluating a patient with cancer, ask:
- Do you find it difficult to get things done during the day?
- Are you sleepy during the day?
- Do you find that you fall asleep when you don't want to?
- Is your sleep at night disturbed?
- Do you have difficulty falling or staying asleep?
- How is your poor sleep and fatigue affecting your quality of life?

Menopause. Complaints of sleep disturbance are more prevalent for women than men across the lifespan and do increase in midlife, affecting approximately 40% of women. Sleep difficulties in postmenopausal women may be due to hormone changes, hot flashes, or the onset of a sleep disorder, such as periodic limb movements or sleep apnea. However, not all sleep complaints in peri- or postmenopausal women are hormone-related. Questions to ask include:
- Are you fatigued and sleepy during the day?
- Does your bed partner report that you snore or kick at night?
- Are you depressed or stressed?

Chronic pain. Multiple factors make sleep disturbances common in patients with chronic pain, including the pain itself, mood disorders associated with pain, medications, sleep disorders, and poor sleep hygiene. It is important to ask patients if pain interrupts their sleep (ie, is the pain directly related to sleep, or is the sleep problem exacerbating the pain?). Pain medications can affect sleep, as can alcohol intake at night, and caffeine intake during the day. Other questions to ask include:
- Are you depressed or anxious? (Mood disorders are common in this population)
- Are you physically active?
- Describe your sleep habits.

The more pain patients have, the more likely they are to be physically inactive, which can have a negative effect on sleep and can contribute to poor sleep hygiene.

Primary sleep disorders
Physicians should not disregard a primary sleep disorder as the cause of sleeping difficulties in older patients. Obstructive sleep apnea, RLS, periodic limb movement disorder, circadian rhythm disorder, or parasomnia should be included in the differential diagnosis. If a physician suspects that an older patient's sleep problems are caused by a primary sleep disorder, the following questions may be helpful in making a diagnosis.

If sleep-disordered breathing is suspected, ask:
- Do you snore?
- Do you have gasping arousals? (If yes, ask about gasping, choking, and witnessed apneas by a bed partner.)
- Are you excessively sleepy during the day?
- Do you have morning headaches, dry mouth, or sore throat? (These symptoms may be caused by sleeping with the mouth open.)
- Has sleeping, or lack of it, affected your personal life or caused mood changes, such as depression and anxiety?

Specific questions to identify RLS and periodic limb movement disorder include:
- Do you have uncomfortable, aching, crawling sensations in the legs that prevent you from falling asleep or that wake you up? (This is a particularly important question for patients with Parkinson's disease, in whom RLS is common.)
- Are the sensations relieved by movement?
- Do you have increased symptoms in the evening and at rest?
- Do you experience any kicking behaviors or leg cramps during sleep?
- Are you sleepy during the day?

Parasomnias, particularly REM behavior disorder, are more common in the older population and can be identified by asking the patient:
- Do you wake up confused?
- Have you been told that you have agitated, violent movements during sleep? (eg, hitting, kicking, verbalizations, walking or running behaviors during sleep)
- Has any of this behavior resulted in self-injury or injury to others?
- Is this behavior dream or nightmare-related? (Recollection of dream content can be seen in patients with REM behavior disorder, and allows the physician to distinguish between other types of parasomnias.)
- When do these episodes occur? During the first, second, or third part of the night? (REM behavior disorder, because of the preponderance of REM sleep in the early morning hours, will probably be more likely if the episodes are occurring at this time.)

Is the pain directly related to sleep? Is the sleep problem exacerbating the pain?

What next?
There is a complex interaction between illness burden and sleep in older adults. A careful history and thorough diagnostic work-up is warranted in older patients with sleep complaints or patients with medical or psychiatric illnesses. A "yes" answer to any sleep-screening question should prompt the physician to conduct a more detailed sleep history and an assessment of (possibly multiple) underlying causes.

Primary care physicians can play a vital role in the diagnosis of sleep disturbances by asking their older patients specific questions about the quality of their sleep, and by informing them that sleep problems are not a normal part of aging.
References


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