

Sleep disorders

Obstructive sleep apnea syndrome, restless legs syndrome, and insomnia in geriatric patients

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Sleep disorders may affect one out of two older Americans and may present as insomnia, excessive daytime sleepiness, or both. Age-related changes seem to cause a decreased need for sleep. The average 70-year-old sleeps only 6 hours a night, but may obtain an additional hour or even 2 during daytime naps. Older adults also experience an increase in the number of sleep disruptions and an increased incidence of chronic diseases, which can contribute to poorer sleep in this group. The two most common geriatric sleep disorders are obstructive sleep apnea syndrome and restless legs syndrome. Detailed diagnostic workup and treatment are usually referred to a center for sleep medicine where polysomnographic studies are performed. Left untreated, sleep disorders may present a serious threat to the patient's health and lead to increased morbidity and mortality.

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Sleep disorders are estimated to affect nearly 50% of older persons living in the community and nearly two-thirds of those in institutions.¹ Although older women are more likely to complain of sleep difficulties than older men, polysomnographic measurement of sleep quality actually shows a better preserved sleep architecture in older women than in older men.

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This article reviews age-related changes in sleep physiology and covers obstructive sleep apnea syndrome, restless legs syndrome, and insomnia, all common sleep problems in the older population. Tables include information to include in a sleep diary, sleep hygiene recommendations, and recommended drug categories for medical therapy; a sleep log appears on page 43 for use as a patient handout.

Age-related changes in sleep

Age-related changes in sleep needs and patterns are well documented. In general, older persons:

- seem to need less sleep (an average 70-year-old sleeps only 6 hours per night, but may make up with daytime naps often lasting 1 to 2 hours)²

- have greater difficulty falling asleep once they get into bed (increased sleep latency)

- have greater difficulty staying asleep (decreased sleep efficiency—more time spent in lighter sleep resulting in easier awakenings which lead to a sense of fragmented or unrestful sleep)³

- have more medical conditions that can adversely affect sleep (eg, nocturia, chronic pain, concomitant pulmonary disease, or concomitant psychiatric disease, particularly depression), including changes in breathing (apneas and hypopneas) and increased limb movements

- may experience changes in circadian rhythms (which tend to make them fall asleep earlier in the evening).

The increased sleep latency, decreased sleep efficiency, and lack of awareness regarding the need for less sleep all combine to create greater rates of complaints of insomnia in this population. It is not so much sleep-onset or initial insomnia but sleep maintenance or mid-insomnia that affects this group. Consequences of insomnia are impaired mood, reduced vigilance, and excessive daytime sleepiness, which may lead to an increased risk of automobile crashes.⁴

Other age-related changes can lead to more serious sleep disturbances, including sleep disordered breathing (SDB) and periodic limb movements in sleep (PLMS).

Sleep disordered breathing SDB, which affects nearly one-quarter of all older persons, is defined as a respiratory disturbance index (RDI) of >5 respiratory events (apneas and hypopneas) per hour of sleep up to age 60 and >10 respiratory events per hour of sleep after age 60. (The RDI is typically calculated using polysomnography in centers for sleep medicine.) In middle age, sleep apnea is 2 to 3 times more common in men compared with women. After menopause, the incidence of SDB rises rapidly in women: In one community study where SDB was defined as an RDI \geq 15, nearly 75% of postmenopausal women (mean age 63.4) were apneic.^{5,6} This disruptive breathing pattern awakens the patient, contributing to poor sleep experiences.

Periodic limb movements in sleep Almost 35% of those age 65 and older report some PLMS, which had been called nocturnal myoclonus. These repetitive movements, typically in the lower limbs, occur about every 5 to 40 seconds, clustered into episodes that last from a few minutes to several hours. Patients or their bed partners may recognize these movements as brief muscle twitches, jerking movements, or an upward flexing of the feet. These movements are typically rhythmic contractions, usually of the anterior tibialis muscle; an index of more than five per hour of sleep is considered abnormal, especially when associated with an electrocortical arousal. In one insomnia study, 86% of older participants had a mean PLMS index of greater than five events per hour of sleep.⁷ Bed partners are often more disturbed by PLMS than patients. Although not medically serious, PLMS can be a contributing factor in chronic insomnia, daytime fatigue, or both. On occasion, PLMS is associated with a serious medical condition, such as kidney disease or iron-deficiency anemia.

Patient workup

The two most common geriatric sleep disorders are obstructive sleep apnea syndrome (OSAS) and restless legs

syndrome (RLS). Left untreated, sleep disorders may present a serious threat for the patient's health and lead to increased morbidity and mortality.

Three questions can help in screening for sleep disorders:

- 1) Is your sleep restorative?
- 2) Does sleep or fatigue intrude in your daily activities?
- 3) Does the bed partner or caregiver report any unusual sleep behaviors, such as snoring, breathing pauses, gasping, abnormal movements?

In one study, nearly 75% of postmenopausal women were apneic with an RDI \geq 15

Patients who complain of any type of sleep disturbance—insomnia or excessive daytime sleepiness—should be asked to keep a 2-week sleep log or diary (table 1). Primary care physicians can use the log to help patients pinpoint specific concerns, such as sleep-onset insomnia, sleep maintenance insomnia, or excessive daytime sleepiness.

Taking a complete history, including nature of the difficulty, onset and duration of symptoms, psychiatric history, and careful assessment of sleep patterns, is also key.

Medication review is mandatory because side effects in older persons can be more pronounced than in younger persons. In addition, certain medications, such as hypnotics, can lose their efficacy within a few weeks, and may worsen some pre-existing sleep disorders. For example, ben-

zodiazepines may adversely affect OSAS. Also mandatory is an inquiry into use of over-the-counter drugs—especially combinations of aspirin or acetaminophen with antihistamines—and herbal remedies.

Medical conditions that can disturb sleep include untreated chronic cardiac or lung disease, thyroid disease, gastroesophageal reflux disease, and chronic pain. The physical examination should pay close attention to:⁸

- general appearance, including an assessment of nutritional status, general care, personal hygiene, and social exchange. Posture problems may identify patients with osteoporosis who require further evaluation; pain associated with osteoporotic fractures can contribute to sleep concerns.
- vital signs, in particular hypertension, which has been associated with OSAS (treating OSAS improves hypertension).
- the head and neck, inspecting for exophthalmos (check for hyperthyroidism), micrognathia (small jaws), midfacial abnormalities (eg, deviated nasal septum), and myopathic (droopy) facies, all of which are associated with OSAS and other sleep-related breathing disorders. Large neck size (>17 inches), often associated with obesity, increases risk of OSAS, but neck examination should also evaluate for tu-

Table 1 Elements of a sleep log or diary

- time they got into bed
- time they switched out the light
- time they fell asleep
- number of nocturnal awakenings
- rising time
- daytime alertness
- number and time of daily naps
- foods consumed and timing of meals
- amounts and times of alcohol consumed
- medications, including all over-the-counter and herbal remedies, and prescription medicines

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Table 2 Clinical presentation of obstructive sleep apnea syndrome

- snoring (but no discernible pattern)
- breathing pauses (observed by bed partner)
- excessive daytime sleepiness
- awakenings with gasping
- waking with a headache
- waking with heart racing

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mors. Special attention should be given to the oropharyngeal space, which is often compromised (low soft palate, large uvula, large tongue, sometimes tonsillar hypertrophy).

- the heart and lungs, performing inspection, auscultation, palpation, and percussion of the chest. Congestive heart failure and chronic obstructive pulmonary disease can contribute to sleep difficulties in older patients.

- the abdominal area, examining for tumors and masses. Excessive obesity has been associated with SDB.

- neurologic findings; sleep disturbances are part of disease progression in organic brain syndromes, dementia, and Alzheimer's disease; neuromuscular diseases (spinal muscular atrophy), can contribute to daytime sleepiness by causing OSAS, hypoventilation, or both during sleep.

Patients with excessive daytime sleepiness will report unexpected sleep episodes, such as falling asleep while watching TV or at the movies or in more severe cases, while talking with someone or even while driving. These patients should be referred to a center for sleep medicine, as they usually have an organic underlying sleep disorder.

Obstructive sleep apnea syndrome

Obstructive sleep apnea syndrome has a prevalence of 4% in the total population, but reaches almost 25% in the geriatric population. In one cross-sectional study, 24% of independently living adults age 65 and older had an apnea index (RDI) of ≥ 5 .⁹ Increasing body weight is a risk factor for OSAS that is often associated with increas-

Hallmark symptoms of OSAS include snoring, daytime sleepiness, and morning headaches

ing age and enhanced upper airway collapsibility, which may be caused by overall decline of muscular tightness. Patients with hypothyroidism also have an increased incidence of OSAS. Untreated OSAS may predispose patients to hypertension, cerebrovascular accidents, and cardiac arrhythmias. An RDI of ≥ 30 events per hour is associated with a 50% increased risk of death.¹⁰

Obstructive sleep apnea can be identified following a thorough history (snoring, daytime sleepiness, morning headaches) and physical examination (increased neck circumference), but evaluation by a sleep specialist and overnight polysomnography are needed to confirm the diagnosis (table 2).¹¹ The sleep specialist will take a detailed sleep history and general medical history, followed by physical examination. Special attention is given to the configuration of the oropharyngeal space, which often shows a low-set soft palate, large uvula, large tongue, and an erythematous and edematous oropharyngeal mucosa.

Typically, OSAS is diagnosed following overnight polysomnography

(PSG), consisting of a 16-channel recording of brain waves, eye movements, respiratory effort, nasal/oral airflow, ECG rhythm strip, and limb movements, as well as oximetry (a measure of oxygenation). Based on PSG results, which may be followed by measurement of daytime sleepiness, treatment is initiated.

The gold standard of treatment for OSAS is nasal continuous positive airway pressure (n-CPAP), which acts as a physical splint that prevents the collapsing of the upper airway. Patients usually need a second night of overnight polysomnography for n-CPAP adjustment to determine the correct pressure for home use. Some patients find the n-CPAP headgear and tubing too cumbersome for restful sleep, develop pressure sores from the tight-fitting mask, experience claustrophobia, or are disturbed by the white noise of the pressure generator; as a result, the long-term compliance rate for n-CPAP therapy is 60 to 70%.

If the problem is positional sleep apnea (apneic episodes only when patients sleep on their backs), positional training with an inflatable backpack, for example, is a proven option. Alternatively, patients can purchase (or make their own) T-shirts with pockets in the back that can be filled with tennis balls, thus making it uncomfortable for them to sleep on their backs.

Another treatment option is a custom-fitted dental mandibular advancement device, which locks the jaw in a protruded position, thus opening up the oropharyngeal space.

In patients who are unable to tolerate n-CPAP, an ear/nose/throat consult may be indicated to evaluate for possible removal of structural oropharyngeal pathology. Uvulopalatopharyngoplasty (UPPP) involves removal of the soft palate, uvula, and other peripharyngeal tissues, sometimes including the tonsils. Although it may stop snoring, this procedure may not cure OSAS because it only addresses anatomic narrowing of the upper airway of the

oropharyngeal level. Thus, UPPP is not indicated when narrowing is caused by excessive parapharyngeal fatty tissue deposits in the hypopharyngeal space. It remains difficult to predict which patients will respond well to UPPP.

For all treatments, be it positional training, UPPP, or dental appliance therapy, a followup polysomnographic study is indicated to assess therapeutic efficacy of the selected treatment.¹²

In cases of central sleep apnea, congestive heart failure must be ruled out. Often, administration of low-flow oxygen (eg, 2 to 3 liters per minute) will eliminate central sleep apnea. Nasal bilevel continuous positive airway pressure (BiPAP—which uses a higher inspiratory than expiratory pressure) may be combined with timed respiratory support and tried as well. These procedures are best performed in a sleep center.

Restless legs syndrome

Restless legs syndrome is characterized by nighttime symptoms with a restless feeling in the legs, and ill-defined sensations described as muscle twitching, sensations of pins-and-needles, or cramps and muscle aches. These feelings are only relieved by activities such as pacing. About 20% of adults age 80 and older experience RLS.¹³

Typical RLS patients will benefit from low doses of carbidopa/levodopa (eg, Sinemet, 25/100 mg at bedtime) or dopaminergic medications (eg, pramipexole, 0.125 mg at bedtime), such as those used in Parkinson's disease. (There is no association between RLS and Parkinson's disease.) If no significant improvement in symptoms is achieved with these agents, patients should be referred to a sleep medicine center for polysomnographic evaluation.

Insomnia

Often, the best cure for insomnia is a brief instruction in basic sleep hygiene (table 3).

Many patients will spend about 10 hours in bed, but will sleep for 6 hours,

Table 3 Recommended sleep hygiene

- Be aware of how much sleep you actually need: the average 70-year-old needs only 6 hours/day, total, including naps.
- Get up at about the same time everyday—weekends and weekdays.
- Go to bed only when sleepy; reserve bed for sleep and sex only.
- Establish a relaxing presleep routine, such as reading a book or listening to relaxing music.
- Avoid heavy meals or caffeinated beverages within 5 to 6 hours before bedtime.
- Avoid smoking/nicotine products close to bedtime.
- Avoid sleeping pills for periods longer than a few weeks. Be careful not to drink alcohol while taking sleeping pills.
- Maintain a regular daily schedule that includes exercise, down time, and regular meal times. Avoid strenuous exercises within 6 hours of bedtime.
- Early afternoon naps can prevent early evening dozing.
- If necessary, restrict caffeine intake, including coffee, tea, caffeinated sodas, chocolate, and certain over-the-counter medications.

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leaving the impression that they “did not sleep half the night.” Treatment for sleep onset insomnia is a simple intervention called “sleep consolidation” or “sleep restriction therapy.” This consists of allowing the patient to stay in bed for a limited amount of time, typically starting with the amount of time the patient claims to sleep. For example, if a patient claims to get only 5 hours of sleep, he or she can stay in bed for 5 hours only (such as from midnight to 5 a.m.). After 2 or 3 difficult nights, which result in a slight sleep deprivation for the patient, the patient will subsequently sleep through those 5 hours, and have the impression he or she “slept almost all night.” Once sleeping, total time in bed may be extended by 15 minutes to one-half hour per week until insomnia recurs. During sleep consolidation therapy, “rescue medications,” such as zolpidem (5 mg taken before bedtime) or zaleplon (5 mg taken before bedtime or when waking up in the middle of the night), can be prescribed.

Because melatonin levels decrease with age and reduced melatonin can be a factor in insomnia, OTC melatonin, 1 to 3 mg, taken approximately

RLS patients may benefit from low doses of carbidopa/levodopa or dopaminergic agents

4 hours prior to the desired sleep time, may be useful.¹⁴

Should insomnia persist despite following the sleep hygiene recommendations, further evaluation in a sleep center with possible polysomnography should be considered to rule out any underlying organic sleep pathology.

Sleep maintenance insomnia If early morning awakening is the chief complaint, with patients waking up around 2 or 3 a.m., consider two underlying diseases: depression or alcohol abuse. Complaints of poor sleep are common in patients with depression, so a trial of antidepressant therapy may be warranted.¹⁵ If insomnia persists, these patients should be screened by a psychiatrist, as depression and alcohol abuse

Table 4 Selected pharmacotherapies for insomnia, restless legs syndrome in older adults*

Agent	Recommended dose/timing	Comments
Nonbenzodiazepine hypnotics for insomnia		
Zolpidem tartrate (Ambien)	5 mg at bedtime	Drug of choice for treatment of sleep-onset and sleep-maintenance insomnia; duration should not exceed 2 to 3 weeks
Zaleplon (Sonata)	5 mg at bedtime	May also be used to dose in the middle of the night; has been shown to cause daytime drowsiness; may use for 2 to 3 weeks
Benzodiazepine for insomnia		
Temazepam (Restoril)	7.5 mg at bedtime	Consider ruling out OSAS first. (benzodiazepines may worsen OSAS)
Hormone replacement therapy for menopausal insomnia		
Conjugated estrogens	0.3 to 1.25 mg in the morning	Has been shown to improve sleep and reduce OSA
Antidepressants for insomnia and depression		
Sertraline HCl (Zoloft)	50 mg in the morning	Well tolerated; treatment with antidepressants is indicated for clinical depression at any age
Fluoxetine HCl (Sarafem)	20 mg in the morning	Same as sertraline
Mirtazapine (Remeron)	15 mg at bedtime	In cases of depression associated with severe insomnia and anxiety, has been shown superior to SSRIs
Dopamine agonists for restless legs syndrome (RLS)		
Carbidopa/levodopa (Sinemet)	25/100 mg at bedtime	Traditionally used for RLS; may cause augmentation (shift symptoms to daytime)
Pramipexole (Mirapex)	0.125 mg at bedtime	Newer dopamine agonist; may cause excessive sleepiness
OSA: Obstructive sleep apnea syndrome		SSRIs: Selective serotonin reuptake inhibitors
*Before prescribing any agent, perform medication history, check for possible Black Box warnings, investigate possible drug-drug interactions, review potential adverse events, and verify dosing recommendations.		
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often coexist, with patients trying to treat their depression with alcohol. Alcohol reduces sleep latency (the number of minutes before the onset of sleep), but also causes frequent nocturnal awakenings in the later sleep period.

Treatment

Treatment begins by encouraging patients to lose weight (if indicated in OSAS patients) and to avoid alcohol and sedating medications before bedtime. Patients should be advised to avoid activities requiring sustained vigilance, such as driving, until the sleep disorder is successfully treated.

Consider depression or alcohol abuse when the chief complaint is early morning awakening


Long-term treatment with prescription hypnotics is not advised because most hypnotics lose their efficacy within a few weeks, have side

effects, and, in fact, may worsen a pre-existing sleep disorder, such as OSAS. Table 4 provides dosing recommendations for various pharmacotherapies in the geriatric population.

Hormone replacement therapy (HRT), in particular conjugated estrogens, has been shown to improve sleep in menopausal women, primarily by reducing sleep disturbances caused by vasomotor symptoms. HRT also reduces OSAS in this population and should be considered. Patients taking HRT need to be advised to notify their physicians if they notice any breast masses, depression, or changes

in vaginal bleeding, or if they experience chest pain, tingling, or shortness of breath; they should also be advised of photosensitivity issues and not to skip doses.

Conclusion

Complaints of insomnia or excessive daytime sleepiness need to be addressed as clinical presentations of potentially life-threatening disease, such as OSAS. If medical conditions have been treated or ruled out and sleep disturbances persist, primary care physicians should refer patients to a center for sleep medicine for a polysomnographic diagnostic workup, as well as tailored treatment. Most sleep disorders are treatable, and treatment can provide patients not only a good night's sleep but concomitant improvements in daytime functioning as well. 

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References

1. Sleep disorders in the elderly. Last accessed 10/7/02 at www.mayo.edu/geriatrics-rst/sleep.html
2. Cauter EV, Leproult R, Plat L. Age-related changes in slow wave sleep and REM sleep in relationship with growth hormone and cortisone levels in healthy men. *JAMA* 2000; 284(7):861-8.
3. Boselli M, Parrino L, Smeireri A, Terzano MG. Effect of age on EEG arousals in normal sleep. *Sleep*. 1998; 21(4):351-7.
4. Martin SE, Engleman HM, Dreaury IJ, Douglas NJ. The effect of sleep fragmentation on daytime function. *Am J Respir Crit Care Med* 1996; 153(4 Pt 1):1328-32.
5. Ancoli-Israel S, Kripke DF, Klauber MR, Mason WJ, Fell R, Kaplan O. Sleep-disordered breathing in community dwelling elderly. *Sleep* 1991; 14(6):486-95.
6. Redline S, Kump K, Tishler PV, Browner I, Ferrette V. Gender differences in sleep disordered breathing in a community-based sample. *Am J Respir Crit Care Med* 1994; 149(3 Pt 1):722-6.
7. Youngstedt SD, Kripke DF, Klauber MR, Sepulveda RS, Mason WJ. Periodic leg movements during sleep and sleep disturbances in the elderly. *J Gerontol A Biol Sci Med Sci* 1998; 53(5):M391-4.
8. Hertz G, Cataletto ME, Barthlen GM. Sleep dysfunction in women. May 2002. Last accessed 10/7/02 at www.emedicine.com/neuro/topic656.htm
9. Ancoli-Israel S. Epidemiology of sleep disorders. *Clin Geriatr Med* 1989; 5(2):347-62.
10. Ancoli-Israel S, Kripke DF, Klauber MR, et al. Morbidity, mortality and sleep disordered breathing in community dwelling elderly. *Sleep* 1996; 19(4):277-82.
11. Malhotra A, White DP. Obstructive sleep apnoea. *Lancet* 2002; 360(9328):237-45.
12. Quan SF. Uvulopalatopharyngoplasty for obstructive sleep apnea-good and bad news. *Sleep Medicine* 2001; 2(4):279-80.
13. Phillips BA, Young T, Finn L, Henning WA, Asher K, Purvis C. Epidemiology of restless legs symptoms in adults. *Arch Intern Med* 2000; 160:2131-41.
14. Olde Rikkert MG, Rigaud AS. Melatonin in elderly patients with insomnia. A systematic review. *Z Gerontol Geriatr* 2001; 34(6):491-7.
15. Foley DJ, Monjan AA, Brown, SL, Simonsick EW, Wallace RB, Blazer DG. Sleep complaints among elderly persons: An epidemiologic study of three communities. *Sleep* 1995; 18(6):425-32.

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