Managing sleep disorders in the elderly

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Sleep needs change with age, and sleeping problems generally increase with aging. Sleep disorders and sleeping difficulties are among the most pervasive and poorly addressed problems of aging. Primary sleep disorders can be associated with significant medical, psychological, and social disturbances.

However, aging does not mean elders should encounter sleep disorders; it merely increases the possibility that more elders will seek help to manage the problem. Therefore, NPs should become familiar with information about insomnia and sleep disorders.

This article will provide an overview of sleep physiology in the aging population, identify common sleep disorders, and suggest pharmacologic and nonpharmacologic treatment options.

Sleep is as important to well-being as food and water. Getting enough sleep can have a significant impact on daily function, alertness, and overall quality of life. Adults need 7 to 8.4 hours of sleep a night to carry out normal physiologic processes each day. Aging is associated with a decrease in the quality of nighttime sleep, and 30% of aged persons may experience chronic insomnia. Age-related insomnia has been linked to changes in the strength of the circadian regulation of sleep, which leads to increased fragmentation of the sleep-wake cycle.

Harbison notes that sleep disorders take away from quality of life and may lead to systemic diseases. Hoffman indicates that normal aging is accompanied by sleep pattern changes that may result in daytime sleepiness and affect the quality of life in older adults.

Many elders report frequent napping, and have difficulty falling asleep and staying asleep. These changes may be precursors to more serious sleep problems that can become more prevalent. According to Pressman et al., nocturia-related awakenings cause significant sleep disruption and fatigue in elderly patients and correlate with an increased number of falls at night.

Sleep apnea has also been associated with nighttime falls. Other behaviors that can affect sleep in elders include exercise; caffeine, nicotine, and alcohol intake; pain; anxiety; and stress. Consequences of sleep-deprived elders can include car accidents,
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work-related accidents, poor daily performance, depression, anxiety, and decreased quality of life.6

Sleep physiology

The human body has many rhythms that influence and regulate physiologic functions, performance, moods, and behavioral responses. A major determinant of sleep is the internal biological clock that regulates the circadian rhythm over a 24-hour period. Any disruption of this rhythm can result in interrupted sleep and cause a myriad of problems, including fatigue, mental changes, cognitive difficulties, and physical changes.

Sleep also has an internal organization regulated by different areas of the brain. This rhythm is controlled and regulated by two brain processes. The restorative process is a response to how long one stays awake. The longer the period of time one goes without effective sleep, the stronger the drive to sleep. The second process controls the timing of sleep and wakefulness during the day-night cycle. The timing of sleep is controlled by the suprachiasmatic nucleus (SCN) of the hypothalamus, which responds to light and causes sleepiness at night when it is dark7 (see Location of SCN).

Rapid eye movement (REM) and non-rapid eye movement (non-REM) sleep. Sleep is divided into two states: non-REM and REM. Non-REM is divided into four stages, and each progresses closer to REM sleep.8 During non-REM sleep, breathing and heart rates slow, BP decreases, and body temperature drops. Brain wave activity during non-REM sleep is dominated by large, slow waves that differ markedly with the short, rapid wave patterns characteristic of REM sleep and the waking state. In contrast, REM sleep is related to wakefulness because brain wave activity during REM sleep is marked by short, rapid wave patterns similar to brain wave activity of the waking state.9

REM sleep is a critical state for sleeping elders. During REM sleep, the brain replenishes neurotransmitters that organize neural networks essential for remembering, learning, performance, and problem solving. REM sleep also transfers short-term memories in the motor cortex to the temporal lobe to become long-term memories. REM sleep has restorative and growth-inducing properties, and plays a major role in maintaining general health.10

Hormonal regulators. Melatonin is important to regulate normal sleep cycles. This hormone is produced by the pineal gland, a small endocrine gland found near the center of the brain. Melatonin is produced during “dark hours” of sleep and is released in response to changes in light and inhibits the neurotransmitters involved in arousal, such as histamine, norepinephrine, dopamine, and serotonin.6 Melatonin has also been noted to induce sedation and lower core body temperature.12

Adults often require less sleep as they get older, and adults in their late 70s need 30 to 60 minutes less than people in their early 20s. Harbison7 notes that the proportion of REM sleep to non-REM sleep is preserved throughout life. However, the duration of REM sleep, during which dreams occur, can vary. Older adults spend less time in the later stages of non-REM sleep, which results in a lighter sleep and easy arousal. Consequently, even though elders need a shorter duration of sleep, they may need to spend longer in bed to get it.5
Sleep disorders in aging

The International Classification of Sleep Disorders, published by the American Academy of Sleep Medicine, identifies approximately 90 different sleep disorders with varying degrees of severity.1

Insomnia. Insomnia is the number one sleep disorder complaint in older adults. Insomnia is defined as difficulty falling asleep, staying asleep, or sleep that is nonrestorative. Clinically significant insomnia is accompanied by significant distress or impairment that occurs for at least 1 month.14 According to Hoffman,9 insomnia can be a symptom and a sleep disorder.

The causes of insomnia can range from medical, psychological, and psychiatric issues to environmental and behavioral issues. Insomnia can also stem from using drugs that may increase physiologic processes, alcohol, medications, or other substances. Often, elders encounter insomnia due to chronic pain and discomfort that may be caused by arthritis, esophageal reflux, and nocturia.3

Depression. Studies suggest that depression is a major risk factor for insomnia and can be the reason why older patients with major depression or anxiety disorders seek treatment. Roberts, Shema, Kaplan, and Strawbridge15 examined the effects of age, gender, education, marital status, social isolation, functional impairment, financial strain, and alcohol use on depression and sleeplessness. In addition to insomnia, depression was noted as a risk factor for severe daytime sleepiness, due to early morning awakening, or problems initiating sleep.

A meta-analysis of risk factors for depression among elders, which affects more women than men, included bereavement, sleep disturbance, disability and prior depression.16 McCurry, Gibbons, Logsdon, Vitiello, and Teri17 examined nighttime insomnia in patients with Alzheimer disease (AD) and found that nocturnal and daytime sleep disturbances were common.

Nocturnal behaviors include wandering, day/night confusion, hallucinations, getting out of bed repeatedly, and talking behaviors that make AD difficult to manage. Other researchers have reported that damaged neuronal pathways that initiate and maintain sleep are responsible for many sleep difficulties encountered by patients with AD. It is also believed that psychological issues in patients with AD and changes in the circadian timing system may contribute to sleeping disorders and insomnia.14 Patients with AD who have sleep problems can benefit from sleep hygiene education, daily exercise, and increased light exposure.

Sleep disordered breathing (SDB) and sleep apnea. Older people also experience other sleep disorders that disturb normal sleep patterns and affect quality of life.6 SDB, or sleep apnea, affects approximately 25% of elders.19 SDB is defined as a respiratory disturbance index of greater than five respiratory events (apneas and hypopneas) per hour of sleep up to age 60, and greater than 10 respiratory events per hour of sleep after age 60.19

The most common form of SDB in older adults is obstructive sleep apnea (OSA). Studies show that OSA affects approximately 25% of the older population. Risk factors for OSA, which affects more men than women, include obesity, age, and diabetes. Since normal ventilation does not occur in elders with sleep apnea and there is a cessation of airflow for more than 10 seconds, sleep is interrupted and the person may be aroused from slumber.18 Normal ventilation then occurs and the person tries to go back to sleep. This cycle causes fragmented, nonrestorative sleep. After years of living with this untreated problem, patients may experience right-sided heart failure, cardiac dysrhythmias, stroke, or even death.19

Treating insomnia in older adults secondary to sleep apnea may include continuous positive airway pressure (CPAP). This treatment remains the most effective therapy for patients suffering from sleep apnea. Treatment with a CPAP machine eliminates upper-airway flow limitations in most patients, and it is associated with improved daytime symptoms and objective measures of sleepiness in patients with mild or severe abnormalities in the apnea-hypopnea index.20 Using CPAP can help reverse the detrimental effects of OSA, such as cardiac dysrhythmias, hypertension, and heart failure. Although the short-term clinical effects of CPAP have been well documented, long-term clinical effects have not been well reported.21

Restless legs syndrome (RLS). Another cause of sleep disruption in older adults is RLS. According to the Restless Legs Syndrome Foundation,22 this condition affects more than 20% of adults over age 80. To be diagnosed with RLS, a person must meet the following criteria: a strong urge to move the legs and feelings described as creeping, itching, tugging or gnawing; symptoms start or become worse at rest; symptoms improve with leg movement and may offer complete or partial relief; and symptoms are worse at night. RLS can be caused or precipitated by drugs or medicines,
such as selective serotonin reuptake inhibitors, lithium, calcium channel blockers, or withdrawal from sedatives or opioids. Due to the increasing problem of polypharmacy in older people, RLS is becoming more common.\textsuperscript{23} Diagnosing RLS is a lengthy process because diabetes and anemia must be ruled out with lab tests.

\textbf{Sleep assessment in elders}
Assessing sleep disorders is critical when providing care for this population. The Epworth Sleepiness Scale (ESS) is a reliable, well-known sleep scale and is considered the best practice in nursing care to assess sleepiness in older adults by the Hartford Institute for Geriatric Nursing.\textsuperscript{23} The ESS distinguishes between the average amount of sleep and problems with sleep deprivation that require intervention. High internal consistency and a Cronbach alpha from 0.73 to 0.88 are reported for this instrument.

The older adult self-reports on the likelihood of dozing in various situations. Using this instrument can provide advanced practice nurses with a quantitative measurement of the impact of sleep disorders in geriatric clients.

When conducting a history, it is important that NPs ask about sleep behaviors and bedtime rituals, and recognize when responses indicate a potential problem.\textsuperscript{6} If an older patient reports difficulty falling asleep or being able to stay asleep, frequent nighttime awakenings, or wakes up tired and groggy, further assessment and referral is warranted. During a sleep assessment, the elder may report changes in behavior or mood or display physical signs of sleep deprivation that can signify an underlying sleep disorder.

Advanced practice nurses should ask about existing health problems and related medication use, including over-the-counter (OTC) products and alcohol. Elders may self-medicate with OTC products that contain antihistamines or use alcohol as a sleep-inducing agent.\textsuperscript{6} Guidelines for diagnosing and treating insomnia include determining potential causes, such as sleep apnea, uncontrolled pain, RLS, and periodic limb movement disorders, all of which may be indicative of neurological disease.\textsuperscript{23}

\textbf{Nonpharmacologic interventions.} A comprehensive sleep assessment should be conducted and a plan needs to be developed. Nonpharmacologic interventions in sleep-deprived elders can be of benefit alone or combined with drug therapy. Behavioral management in the older adult population must begin by eliminating common causes of insomnia.\textsuperscript{23} For instance, teach elders to avoid caffeine and alcohol, and limit fluids before bedtime.\textsuperscript{23} They should also avoid stimulating activities before bedtime, such as exercise, watching TV, or reading.

Good sleep habits can decrease problems with insomnia as well. Developing a sleep ritual to ensure that the bedroom environment is soothing and relaxing helps reduce sleeplessness.\textsuperscript{23} The bed should be used only for sleeping and sexual activity.\textsuperscript{23} The time spent in bed should be identical to the amount of sleep.\textsuperscript{23} Elders should set an alarm clock and get up at the same time each morning, and eliminate afternoon naps.

Proper nutrition, exercise, and healthy relationships improve mood, relieve depression, and allow for a better night’s sleep. Patients with medical diagnoses such as acid reflux are encouraged to eat an evening meal at least 3 to 4 hours before bedtime, with a nighttime light snack if necessary. It is useful to note that sleeping with the head elevated may also help acid reflux symptoms. To ease anxiety, encourage patients to turn alarm clocks around, which decreases anxiety and pressure to go to sleep. If anxiety is present before bedtime, a warm bath may help calm nerves.\textsuperscript{23} Often nonpharmacologic methods alone are not effective to treat sleep disorders. If nonpharmacologic interventions fail, the NP may need to provide referrals to sleep specialists, or add pharmacologic components.

\textbf{Pharmacologic interventions.} Due to problems with polypharmacy in the older population, pharmacologic treatment for sleep disorders must be managed with caution. Pharmacologic interventions for insomnia include OTC and prescription medications.\textsuperscript{28} Major OTC sleep remedies contain antihistamines, such as diphenhydramine or doxylamine. Tolerance to OTC antihistamine remedies may only take 3 days\textsuperscript{26} and can leave older adults feeling drowsy and unproductive when they get up in the morning. Anticholinergic adverse reactions are often an unwanted result of treatment.

OTC melatonin has been recommended by some practitioners to assist sleep. Melatonin helps patients fall asleep when taken 1 to 2 hours before bedtime and hastens time to REM sleep; however, it does not increase time spent in REM sleep.\textsuperscript{27} A newer prescription drug for insomnia, ramelteon (Rozerem), is a melatonin agonist that can help patients who experience problems with sleep onset. Ramelteon induces sleep within 30 minutes, but it is not effective maintaining sleep. Because ramelteon is not a controlled substance, long-term use is considered safe.\textsuperscript{28}

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\caption{Patients with medical diagnoses such as acid reflux should eat an evening meal at least 3 to 4 hours before bedtime.}
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Other prescription treatments for insomnia include drugs such as benzodiazepines, nonbenzodiazepines, and antidepressant medications. These medications are acceptable for short-term usage to “reset” the circadian clock and allow a good night’s sleep. Benzodiazepines indicated for insomnia include: triazolam (Halcion); flurazepam (Dalmane); quazepam (Doral); estazolam (ProSom); and temazepam (Restoril). Therapy with these drugs, when kept to 2 to 3 weeks, is associated with a relatively low addiction risk. However, if longer-term therapy is warranted, they are indicated for use only 2 to 3 nights per week because tolerance and dependence may occur. After discontinuing the benzodiazepine, rebound insomnia and withdrawal symptoms can be minimized by weaning patients off the medication. Nevertheless, the benzodiazepine dosage should be reduced in the elderly patient. But, if possible, avoid the longer-acting benzodiazepines, as they are associated with prolonged sedation and an increased risk of falls (see Drugs to treat insomnia in the geriatric patient).

Three drugs, eszopiclone (Lunesta), zolpidem (Ambien), and zaleplon (Sonata), are considered benzodiazepine-like in their action; they induce sleep easily and leave the patient feeling refreshed. These drugs may be safer to use long term, as they are less addicting and vary in their time to onset and duration of action. Zaleplon (Sonata) has a duration of action of only 4 hours, which helps the patient fall asleep, even in the middle of the night, and still awake refreshed. Zolpidem (Ambien) has a short duration of action. However, avoid using the extended-release formulation (Ambien CR) because of slowed elimination and metabolism in the elderly population. Additionally, zolpidem has been associated with hazardous, sleep-related activities such as driving, cooking, and eating while sleeping. The drug must be discontinued in patients who experience a sleep-driving episode.

Finally, certain antidepressants may be used to treat insomnia in geriatric patients. If the patient has coexisting depression, that disorder should be addressed with the appropriate antidepressant drug. Antidepressants as hypnotics are not typically a first-choice treatment regimen, as these drugs may cause significant daytime sleepiness and postural hypotension, among other adverse reactions. For sleep disorders, this category of drugs may be helpful in older adults who have not had success with other measures, have a history of substance abuse, or have insomnia resulting from antidepressants that cause central nervous system stimulation. In this class, atypical antidepressants include trazodone (Desyrel) and nefazodone (Serzone), as well as tricyclic antidepressants such as amitriptyline and nortriptyline (Aventyl). These drugs may be prescribed as adjunctive agents to the other “daytime” antidepressant the individual is already taking. As a result, adverse reactions and drug interactions can be numerous, and it is necessary to take a careful health and drug history prior to prescribing any sleep agents for elderly patients.

### RLS
When treating sleep-deprived patients, it is important to assess the cause of insomnia. For example, as many as 20% of geriatric patients report RLS contributes to insomnia.
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Treating RLS can be difficult and may require different therapies and combinations of drugs before relief is found. Little evidence-based nursing and treatment studies have been performed on patients with RLS.\textsuperscript{34} Treatment for RLS includes a thorough assessment of patient signs and symptoms, and searching for underlying medical reasons, such as peripheral neuropathy or diabetes.\textsuperscript{30} For older adults with mild to moderate symptoms of RLS, NPs may suggest taking supplements to correct deficiencies in iron, folate, and magnesium. Studies also have shown that maintaining a regular sleep pattern can reduce symptoms.\textsuperscript{30}

Nonpharmacologic therapies include encouraging moderate regular physical activity 3 days a week, or taking a hot bath before going to sleep. Although many patients report relief from these measures, rarely do these interventions completely eliminate RLS. Pharmacologic therapies for RLS include dopaminergics, benzodiazepines, opioids, and anticonvulsants. Dopaminergic agents, which are used to treat Parkinson disease, may reduce RLS symptoms and are, therefore, considered the treatment of choice.\textsuperscript{30} Dopaminergic agents include ropinirole (Requip), pramipexole (Mirapex), and levodopa and carbidopa (Sinemet) in an off-label use. Patients usually take these drugs in the evening several hours before bed, and sometimes tolerance to their effect is seen. If patients experience tolerance to the dopaminergic agent, an increase in dosage, or a switch to a different classification of medication may be warranted.

Benzodiazepines are known to reduce symptoms of RLS; however, they do not eliminate RLS altogether, and may lead to daytime sleepiness. Their use for RLS is considered off-label, and using geriatric dosage guidelines is important to prevent this adverse reaction. In severe cases of RLS, opioids may be prescribed to manage pain symptoms. Adverse reactions of opioids include dizziness, nausea, constipation, and vomiting.\textsuperscript{30}

**Patient education**

It is important to provide patient education to treat sleep difficulties or disorders. When possible, it is better to teach elders nonpharmacologic measures to improve sleep. Significant improvement can occur by simply suggesting that people establish a relaxing bedtime ritual each evening. Refraining from caffeine after midday and limiting fluids after dinner can relieve nocturia. In addition, advise elders to avoid naps, and strenuous exercise late in the day, and establish a routine for going to bed and getting up. Also, watching TV and reading books that could cause stress or anxiety before bedtime can interfere with sleep.

When elders take medications that could affect their sleep, they must be aware of the proper times to take them and potential adverse reactions. Caution should be taken with hazardous tasks or driving whenever these agents are used. Suggest choosing a mattress and bed linens that meet comfort level. The relationship between fatigue, quality of life, and safety should always be a part of patient education when counseling elders with sleep disorders.

Sleep disorders are common in the elder population, especially those who reside in long-term-care facilities (LTCF).\textsuperscript{3} A comprehensive health history and physical exam must be performed to rule out other possible underlying causes of insomnia. Nonpharmacologic interventions should be exhausted before prescribing drug therapy. But should drug therapy be used, it should be seen as a short-term option to help reset the patient’s “sleep clock,” and not as a lifestyle for the patient.

Advanced practice nurses play a vital role in assessing poor sleep quality with older adults. NPs are often the providers who make decisions between pharmacotherapeutic interventions and behavioral therapy.\textsuperscript{4} Sleep and sleep hygiene are basic human needs, and disorders can truly diminish an elder’s quality of life.

**Whenever possible, it is better to teach elders nonpharmacologic measures to improve sleep.**

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