# Managing insomnia in older adults

***Abstract: NPs frequently care for patients with complaints of insomnia in the hospital and community settings. Because older adults with insomnia present unique challenges for successful management, NPs should understand the latest assessment and treatment options.***

**By Christine Hedges, PhD, RN, NE-BC and John Gotelli, MSN, NP**

Patients commonly report sleep complaints, such as difficulty initiating and maintaining sleep or awakening too early, to their primary care provider (PCP). However, sleep assessment continues to receive far less attention than other aspects of the health examination. This practice has begun to change over the past decade as increased understanding of sleep reveals physical, psychological, and social detriments associated with sleep deprivation. The U.S. Office of Disease Prevention and Health Promotion's Healthy People 2020 goals now include sleep health.[1] The study of sleep has grown significantly over the past decade, and NPs should be prepared to assess and screen patients appropriately as well as recommend evidence-based nonpharmacologic and pharmacologic treatment options.

**Keywords: chronic insomnia disorder, dementia, Epworth Sleepiness Scale, insomnia disorder, non-rapid eye movement (NREM), Pittsburgh Sleep Quality Index, rapid eye movement (REM), sleep-wake cycle**

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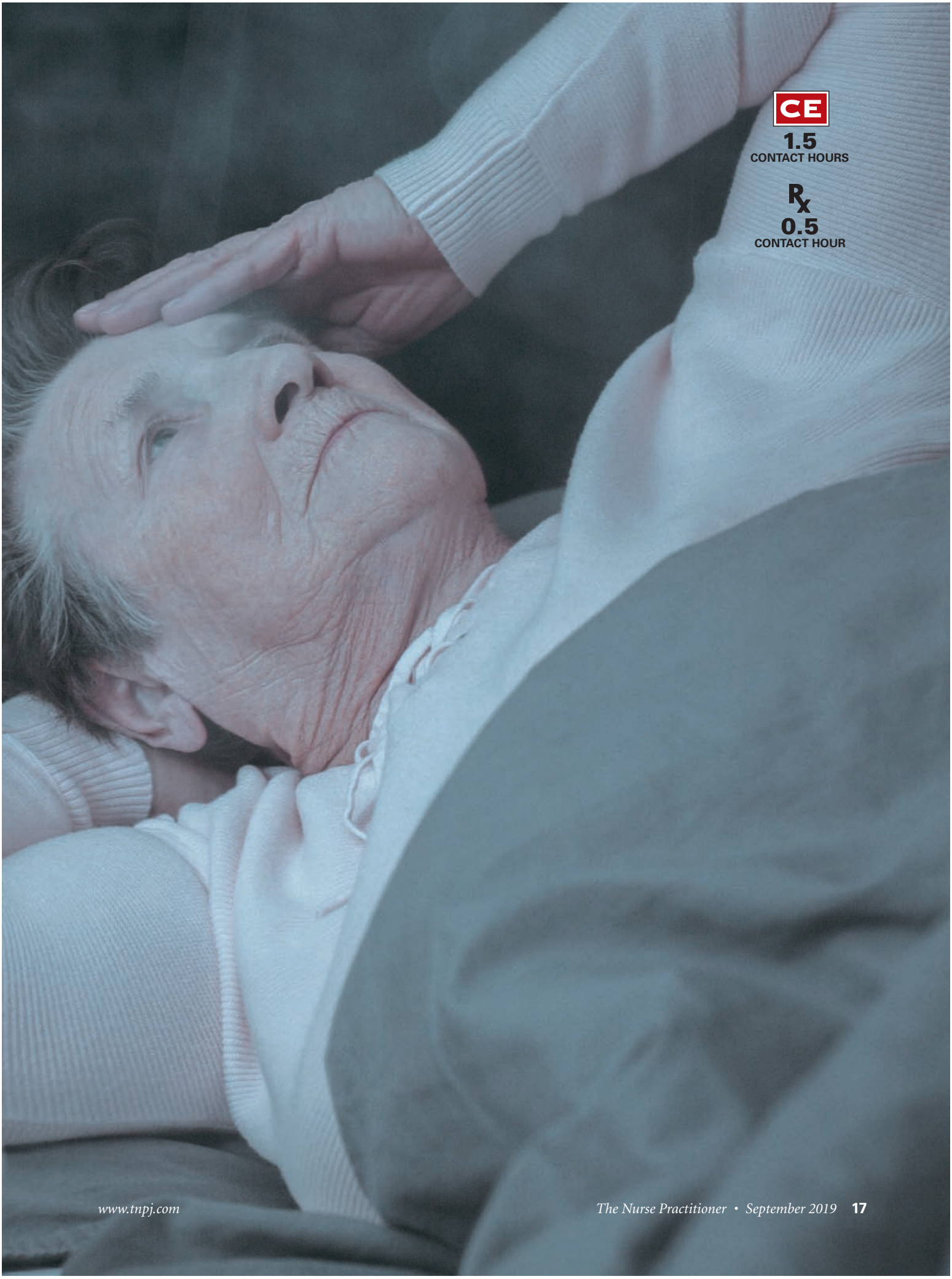

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## New classifications

Insomnia is the most common sleep disorder, and its definition has undergone recent updates.[2] Replacing the previous categories of "primary" and "secondary" insomnia are the new classifications of *chronic insomnia disorder* in the third edition of the International Classification of Sleep Disorders (ICSD-3) and *insomnia disorder* in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5).[3,4] Justification for this change in conceptualization of insomnia favors defining insomnia as a broad category. Both the ICSD-3 and DSM-5 classifications include the following criteria:[5]

- difficulty initiating and maintaining sleep despite adequate opportunities
- duration of at least 3 months
- frequency of at least three times per week
- resultant distress
- not explained by any other cause or disorder.

The National Sleep Foundation recommends adults (ages 26 to 64) sleep 7 to 9 hours a day and older adults (age 65 and older) sleep 7 to 8 hours a day.[6] Despite this recommendation, 25% of US adults report insufficient sleep at least 15 out of every 30 days.[1] In addition, the occurrence of reported shorter sleep has increased over the past 30 years. Insomnia, or the difficulty initiating and remaining asleep, occurs in 33% to 50% of the adult population, and insomnia accompanied by distress occurs in 10% to 15% of the adult population.[1,7] To better assess and treat insomnia and other sleep-wake disturbances, it is essential that NPs understand the chronobiology of the sleep cycle.

## Sleep cycle

Although the exact purpose of sleep is still poorly understood, sleep researchers agree that most humans spend one-third of their lives sleeping. Sleep is essential for health, and the functional consequences of poor sleep are multifaceted and deleterious.

The current understanding of sleep stages comes from studying brain wave (electroencephalogram [EEG]) activity, eye movement (electrooculography), and muscle tone (electromyography). Sleep is divided into two stages, rapid eye movement (REM) and non-rapid eye movement (NREM). NREM is further divided into stages traditionally called 1, 2, 3, and 4. More recently, some sleep researchers use the American Academy of Sleep Medicine terms N for NREM and R for REM, so clinicians may encounter the terms N1, N2.[8] This article will use the traditional terminology.

The normal onset of sleep for adults is through Stage 1 NREM sleep, a brief, light phase that quickly transitions to Stage 2 NREM sleep. Stage 1 usually lasts only a few minutes and individuals can often be wakened easily during this phase before transitioning to the deeper Stage 3 and Stage 4 NREM sleep, where greater stimulus is needed to awake the individual. Stages 3 and 4 are often combined and called N3, delta, or slow-wave sleep (SWS) because the stage is characterized by large, slow delta waves on EEG. REM sleep follows and is characterized by side-to-side eye movement, muscle atonia, and often vivid dreams. This pattern of REM and NREM sleep occurs in approximately 90-minute cycles throughout the night, with REM sleep occupying longer periods later in the night, so that SWS dominates the first third of the night and REM sleep occupies the majority of the last third. It is essential that providers understand the normal distribution of the sleep stages to understand changes that occur to sleep related to disease, cognitive changes, and effects of medication.[8] Describing changes in sleep architecture and circadian rhythm related to aging continues to be a challenging area of research because interrelated factors must be considered, including medical, psychiatric, and cognitive comorbidities as well as the use of sedatives and hypnotics. Most research is based on observational studies, further challenging conclusions. Earlier bedtimes and wake times as well as awakenings related to nocturia continue to contribute to the body of research on sleep architecture changes in the older adults. Therefore, the NP should remember that there may be numerous factors contributing to sleep stage distribution and circadian cycle disruptions.[9]

## Associated medical conditions

Insomnia is associated with multiple comorbidities; however, the temporal order is not always clear. Insomnia is commonly related to psychiatric disorders, such as depression, anxiety, panic, and personality disorders. It has been linked to hormone level alterations, increased BP, and numerous comorbidities, including arthritis, hyperthyroidism, cancer, heart failure, asthma, diabetes mellitus, gastrointestinal reflux disease, chronic pain, pain due to arthritis, sleep disordered breathing such as obstructive sleep apnea syndrome (OSAS), and restless leg syndrome.[10-12]

Insomnia remains a secondary consequence of several medications, both prescription and over-the-counter (OTC) medications. The redistribution of sleep stages can occur when patients take benzodiazepines, which suppress SWS, or antidepressants, which suppress REM sleep.[8] Alcohol, caffeine, and nicotine also are related to insomnia. Alcohol, for instance, has the effect of inducing sleep initially but may result in waking within a few hours with the inability to return to sleep. Insomnia may be the result of external shifts to the sleep cycle such as jet lag and shift work sleep disorders, both of which affect the biological clock and circadian rhythm.[13]

When patients are hospitalized, disruptions to the sleep cycle can occur because of near-constant interruptions, noise, and overhead lighting. This can be particularly disorienting for older adults and those with cognitive impairment and has been linked to measurable adverse physiologic outcomes.[14,15] These outcomes include alterations of homeostatic function, glucose metabolism, cortisol regulation, and acute decline in executive and other cognitive processes.[16] Sleep is an important modulator of the body's immune response.[17] In the ICU environment, sleep disruption has been linked to modulation in immune function, and sleep deprivation can alter the immune response, which may influence a patient's ability to recover from serious infection.[17]

## Insomnia, delirium, and dementia

Sleep disorders are a common complaint among older adults both in community and hospital inpatient settings. More than 50% of noninstitutionalized adults over age 65 have reported some chronic sleep disorder, such as difficulty falling asleep, early morning awakening, nighttime awakenings, or not feeling rested during the day.[10] In hospital settings, the rate is even higher with two-thirds of general medicine hospitalized patients reporting sleep disturbances.[18]

Sleep disturbances are commonly encountered in older adults with dementia. Dementia is included in the category of neurodegenerative diseases, and there are specific subtypes of dementia, such as Alzheimer disease and Lewy body dementia. The subtypes of dementia have their own unique characteristics and manifestations, which are often amplified by various sleep disorders and cited as a major strain by caregivers.[16] Circadian rhythm changes seen in dementia may lead to excessive daytime sleepiness.[19] Compounding this are the associated cognitive and behavioral changes seen in dementia, which then may further exacerbate a healthy sleep-wake cycle. Excessive daytime sleepiness may lead to prolonged daytime napping, which may interfere with components of sleep hygiene.

In contrast to dementia, which is a major neurocognitive disorder that interferes with daily functional activities, delirium is characterized as an acute change in cognitive status characterized by inattention, disorganized thinking, and/or change in level of consciousness. Delirium develops over a course of hours to days rather than the slower progression (months to years) characteristic of dementia. The manifestation of delirium is theorized as a complex interaction of predisposing factors (age, cognitive impairment, functional decline) and precipitating risk factors (infection, metabolic derangement, hypoxia).[20] Disrupted sleep-wake cycle in hospitalized older adults and critically ill patients has been a noted hallmark in those who eventually develop delirium.[21,22]

## Sleep assessment

Sleep assessment, including the patient's sleep history, should be a high priority during patient assessments; it is easily incorporated into the initial physical exam. Both patients and sleep partners can be reliable informants about sleep health. Ask the patient about their "normal" sleep patterns, starting with "lights-out" time until wake-up time. Do not assume that a patient's normal sleep period is at night, as in the case of shift workers. Although an estimate, ask patients about the time it takes to fall asleep from "lights-out" time, how often the patient wakes up at night (or normal sleep period for shift workers), as well as the cause (to use the bathroom, room too warm). Inquire about how long it takes to return to sleep to get an indication of wake after sleep-onset duration. Be sure to ask about daytime napping and ask about medications (prescription, herbal, or OTC) the patient takes for sleep. The patient's sleep partner can provide valuable information about snoring or restlessness that might indicate a more serious problem. More serious concerns, such as sleep disordered breathing and OSAS, will require referral to a sleep specialist. If recall is difficult, a sleep diary is a useful tool for patients to complete prior to their next appointment.

The functional assessment of sleep can begin by asking the patient how well rested they feel upon awakening. Gather details about the patient's daytime sleepiness while sitting, watching TV, driving, or riding in a car. With the recent attention given to the effect of electronic devices and sleep, it is useful to ask about screen time

(smartphone, computer, or tablet) in the hours before sleep. There are numerous tools available to the NP to assess sleepiness, and NPs should take care to choose a well-validated, brief measure. The Epworth Sleepiness Scale (ESS) is a brief and useful tool to assess for sleepiness. The ESS consists of eight items asking the patient to self-report the likelihood of dozing off during daily situations, such as riding in a car, watching TV, or sitting quietly after lunch. Although originally tested with healthy subjects, the ESS has been validated in numerous clinical populations. A systematic review of the properties of the ESS revealed good internal consistency (Cronbach's alpha of 0.73 to 0.86), but with little evidence of test-retest reliability, so it is not recommended for individual-level comparisons over brief intervals.[23] Despite these findings, the ESS remains the most widely used scale to assess for daytime sleepiness due to its ease of use and brevity (less than 5 minutes), but further high-quality studies are still needed.[23,24]

***Recently, there has been a greater emphasis on sleep hygiene as a first step in the management of insomnia.***

The functional assessment should also include questions about daily routines, mood, energy, and fatigue. There are numerous screening tools available to the NP to assess functional qualities of sleep such as the Pittsburgh Sleep Quality Index (PSQI). The PSQI is a 19-item self-report of the patient's sleep during the previous month and measures sleep disturbances, latency, duration, and efficiency as well as daytime dysfunction. The PSQI continues to be one of the most widely used measures of sleep quality and has been tested in both clinical and nonclinical settings demonstrating sensitivity (89.6%) and specificity (86.5%) (kappa = 0.75, $P < .001$) in distinguishing "good" sleepers from "poor" sleepers. The PSQI takes 5 to 10 minutes to administer and incorporates questions for the patient's bed partner.[25,26]

## Nonpharmacologic management

Recently, there has been a greater emphasis on sleep hygiene, or a set of sleep promotion behaviors, as a first step in the management of insomnia. Treatment for chronic insomnia in older adults begins with nonpharmacologic interventions. The recommended initial intervention surrounds behavioral or cognitive-behavioral therapy (CBT) strategies geared toward the older adults, which can take place in the primary care office setting.[27] These strategies include education on using a sleep diary, methods to avoid excessive sleep during the day, and sleep hygiene at night to help sleep onset. Older adults with moderate to advanced cognitive impairment may not be able to undergo CBT independently; however, caregivers may implement some of the strategies by carefully prompting and cuing the patient in select behavioral interventions. For example, a caregiver can exercise daily with their loved one by gently guiding them to a safe and suitable location for a 30-minute walk while they remain at their side.

Components of a sleep hygiene protocol may include advising the patient to: adhere to the same bedtime each night; avoid caffeine late in the day; and allow at least 1 to 2 hours after mealtime before going to bed. Alcohol should not be consumed within 1 to 2 hours before bed. Patients should be advised to power off electronic devices such as phones or tablets at least an hour before sleep, read a print book before going to sleep, and use the bed only for sex or sleep. Adherence to a bedtime routine enhances sleep, and many patients benefit from a warm, decaffeinated drink such as herbal tea or a warm bath or shower.[13] (See *Nonpharmacologic interventions for insomnia.*)

Efforts to enhance sleep hygiene in older adults in both primary care and hospitalized populations consist of interventions carried out by family members and nursing staff. Specifically, for patients with dementia, chronic sleep problems (OSAS, pain, medications) must be addressed.[20] Next, behavioral interventions can be carried out in a consistent and structured manner. Encouraging a regular morning wake-up, which may take prompting from a caregiver, will help prevent sleeping into the early afternoon. Regular or "timed" voiding at specific intervals throughout the day prevent nighttime awakenings because of a full bowel or bladder. Exercise, such as moderate walking or an activity suited to the patient's cognitive level, will help burn excess energy during the day and lead to a feeling of tiredness as bedtime approaches. Dietary changes primarily include avoiding caffeine intake past the morning hours as well as alcohol intake prior to bedtime. Finally, as bedtime approaches, family members can create an environment

that optimizes rest and restoration by minimizing excessive stimulation: turning off TV and electronic devices, reducing ambient noise, and turning down the lights.[29]

## Pharmacologic management

Pharmacologic options may be considered if insomnia persists after nonpharmacologic treatments and behavioral interventions have been implemented. Do not discontinue the nonpharmacologic interventions in place of medications, rather a judicious use of the appropriate medications may enhance a healthy night's sleep. Current guidelines provided by the American Academy of Physicians explain the use of pharmacologic therapies based on their efficacy of collected evidence.[27] Accordingly, because most, if not all, of the pharmacologic therapies are of low-quality evidence, the provider must first create an open dialogue with their patient regarding the benefits as well as potential harms of pharmacologic agents. Current guidelines suggest starting with the nonbenzodiazepine hypnotic agents, such as eszopiclone, zaleplon, or zolpidem, when considering pharmacologic therapy for the general population. However, the 2019 Beers Criteria recommends clinicians avoid this class of medications in the older population because of their potential adverse reactions.

Current guidelines indicate there is insufficient evidence for melatonin use in the general population including older adults. Melatonin supplements taken 1 to 2 hours before bedtime have been shown to improve sleep in older adults with insomnia.[30] Trazodone may be used in low dosages as an off-label prescription for insomnia in older adults. It is currently approved by the FDA for depression, but lower dosages than those used for depression treatment have been shown to induce and maintain sleep while avoiding excessive daytime somnolence.[31] (See *Common pharmacologic therapies for insomnia*.) Although short-term use of select medications for sleep in certain patients may be beneficial, clinicians need to remain cautious when prescribing sleep medications to older adults. Chen and colleagues found in primary care clinics a report of insomnia as well as a prescription for sleep aids both independently predicted falls in the older adults.[32]

## Case study

*Mrs. R is an 82-year-old woman who presents to the NP at the clinic as a follow-up to her recent 3-day hospitalization. Mrs. R was admitted to the hospital for weakness, fatigue, and "not doing well at home." She was found to have a urinary tract infection (UTI) and was treated with I.V. antibiotics. Although she was discharged free from UTI symptoms, her daughter tells the NP that the hospital course was rough. She explains that her mother became very confused at night, did not sleep "at all," and is now even more forgetful and confused than usual. She reports that her mother's sleep cycle is still disrupted and that she is "still taking long naps during the day and just won't sleep at night."*

*The NP reviews Mrs. R's discharge summary and medication list. Mrs. R has a history of type 2 diabetes mellitus, hypertension, heart failure with preserved ejection fraction, "probable" dementia, and osteoarthritis. Her discharge medications are listed as: acetaminophen 1,000 mg orally three times a day as needed, metformin 500 mg orally twice daily, amlodipine 5 mg orally once daily, hydrochlorothiazide 12.5 mg orally once daily (she takes this in the afternoon), lisinopril 20 mg orally once daily, clonazepam 0.5 mg orally twice daily (for "nerves"), and aspirin 81 mg orally once daily. On exam, the NP notes Mrs. R has a frail appearance with a pleasant demeanor who answers questions politely but refers to her daughter for more complex questions. During Mrs. R's exam, she is awake and attentive but appears fatigued and deconditioned. Her daughter wonders if zolpidem could be prescribed "to let my mom finally get some sleep." The NP formulates an assessment and plan and includes disordered sleep in her problem list.*

### Nonpharmacologic interventions for insomnia[28]

Share the following techniques for sleep hygiene and behavioral therapies with patients, families, and caregivers.

- Maintain a regular schedule of waking and going to bed, even on weekends.
- During the day, avoid naps longer than 30 minutes, napping does not make up for the lack of adequate sleep time, but a short nap of 30 minutes or less during the day can help improve mental alertness and mood.
- Engage in regular exercise, and partake in social activities.
- During the day, avoid stimulants such as tobacco and caffeine, especially as evening approaches.
- Create a regular bedtime that minimizes exposure to bright light, excessive noise, and stimulation. The bedroom should be kept dark and slightly cool.
- Use the bedroom for sleep and intimate time rather than eating, watching TV, or engaging with other electronic devices.
- Avoid large meals and alcohol prior to bedtime.
- Educate family members of patients with cognitive dysfunction about the elements of good sleep hygiene, as they will need to guide their loved ones in these therapies.

## Case discussion

For experienced clinicians who work with an older adult patient population, Mrs. R's case is unfortunately all too familiar. The NP begins by reviewing the discharge summary with Mrs. R's daughter and explains that she developed delirium in the hospital that contributed to a reversal in her sleep-wake cycle and although her UTI was successfully treated, she still has residual sleep disturbance even at home. The NP performs a thorough history and physical exam in which she finds that her cognitive testing shows significant deficits and her history of progressive decline in functional status makes a major neurocognitive disorder likely. The NP concludes that Mrs. R's sleep disturbance is likely multifactorial in nature, a combination of chronic pain from osteoarthritis and likely neurocognitive impairment. The NP suggests follow-up cognitive testing in 3 months to more formally

### Common pharmacologic therapies for insomnia[27,33-35]

| Class | Medication | Notes |
|---|---|---|
| Nonbenzodiazepine receptor agonist hypnotic agents | Zolpidem | • Used for short-term treatment of insomnia and to help decrease sleep latency<br>• May cause dizziness, associated with falls in older adults<br>• May cause hallucinations, sleep walking, and other unusual sleep-related activities. |
| | Zaleplon | • Used for short-term treatment of insomnia and to help decrease sleep latency<br>• May cause headache, nausea, dizziness, somnolence, abdominal pain. |
| | Eszopiclone | • Used for short-term treatment of insomnia, to help decrease sleep latency, and improve sleep maintenance<br>• May cause headache, daytime somnolence, gastrointestinal upset.<br>Note: The manufacturers of zolpidem, zaleplon, and eszopiclone are required, per the April 2019 FDA Drug Safety Communication, to include a boxed warning in the prescribing label advising that rare but serious injuries have resulted with the use of these medications because of sleep behaviors, including sleepwalking, sleep driving, and engaging in other activities while not fully awake.<br>• Additionally, these medications are listed on the 2019 Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. |
| Melatonin receptor agonist | Ramelteon | • Used for short-term treatment of insomnia, to help decrease sleep latency and should not be taken with or immediately after a high-fat meal<br>• May cause somnolence, dizziness, fatigue, nausea, and exacerbated insomnia<br>• May be associated with abnormal thinking, behavioral changes, and complex behaviors such as sleep-driving. May worsen depression and cause suicidal thinking. |
| Antidepressants (select) | Doxepin | • Doxepin is an antidepressant and is approved by the FDA to treat insomnia and improve sleep maintenance. It should be taken within 30 minutes of bedtime and should not be taken within 3 hours of a meal to help minimize next-day sleepiness<br>• On the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults<br>• May be associated with abnormal thinking, behavioral changes, and complex behaviors such as sleep-driving. May worsen depression and cause suicidal thinking. |
| Natural hormone | Melatonin | • Dietary supplement, nonprescription<br>• Generally safe in physiologic dosages<br>• May cause excessive sleepiness in higher dosages or when combined with other sleep agents<br>• Not FDA-approved for insomnia. |

Note: Per the American College of Physicians 2018 Guidelines for Management of Chronic Insomnia in Adults, there was insufficient evidence to recommend use of complementary and alternative treatments, such as melatonin. It is included in this table because clinicians may encounter its use in their patients.

evaluate the stated history of "probable" dementia. In the interim, the NP discusses with both the daughter and Mrs. R strategies to assist her sleep-wake cycle now that she is at home. The NP suggests home physical and occupational therapies and encourages her to practice these exercises daily. The NP reviews important sleep hygiene practices, which the patient's daughter admits neither of them practices. The NP also suggests creating either a formal (such as an adult day program) or an informal structured daily routine where Mrs. R wakes up at the same time each day, engages in physical and social activity, followed by an evening routine to "wind down" into sleep. The NP instructs that caffeinated beverages, if used, should be kept to a minimum and not consumed in the afternoons. During review of the patient's medications, the NP notes that clonazepam may have significant serious adverse reactions in older adults such as daytime somnolence, falls, dizziness, and confusion. The NP reviews the need for continuing hydrochlorothiazide, and, if still indicated, schedules this in the morning to avoid middle-of-the-night bathroom visits. Similarly, zolpidem can also contribute to untoward adverse reactions in older adults, and the NP explains that she would like Mrs. R to avoid this medication at this time. The NP suggests a slow tapering off of the clonazepam and provides a drug tapering schedule and reviews nonpharmacologic methods to help with anxiety. Additionally, the NP recognizes that Ms. R may be experiencing pain from her osteoarthritis further contributing to the burden of impaired sleep. If elements from the history and physical exam suggest pain from osteoarthritis, the NP would offer a regimen of acetaminophen 650 mg orally taken three times daily as an overall safe and effective pain management protocol.

Finally, the NP assures Mrs. R and her daughter that she fully appreciates their concerns over sleep disturbances and plans a follow-up visit in 2 weeks. The NP suggests that Mrs. R and her daughter maintain a sleep diary over the next 2 weeks to record bedtime, wake time, and any instances of waking in the night. The NP concludes the visit by mentioning that should sleep not improve, or worsen, over the several days, they can reach her by phone and the NP will discuss a medication at that time, such as OTC melatonin to help improve sleep.

At the return visit 2 weeks later, Mrs. R's daughter is overall pleased with her mother's recovery. She reports that her mother has been participating in the home physical and occupational therapy services and she is regaining her strength. Per the NP's recommendations, her mother has slowly begun tapering off the clonazepam, has avoided caffeinated beverages in the afternoon, has continued regular exercise activities (even on nonphysical and occupational therapy days), and admits that sleep has improved even while tapering off the medications. Mrs. R does continue to state that there are two to three times a week where falling asleep is difficult. The NP therefore recommends melatonin 2 mg orally per night as needed for inability to fall asleep.

## Conclusions and future directions

Insomnia remains a common complaint reported to PCPs in both the community and inpatient settings. NPs can incorporate sleep assessment in their care of patients and are ideally suited to treat patients for insomnia or identify sleep symptoms that may require further investigation. Both hospitalized and community-dwelling older adults are especially subject to altered sleep-wake patterns from both environmental issues and dementia; they therefore represent a specialized at-risk population. Future opportunities for research include investigation of nonpharmacologic sleep-promoting strategies in both acute care and community settings.

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Christine Hedges is Director of Nursing Quality and Research at University of North Carolina Hospitals, and an adjunct professor at The University of North Carolina at Chapel Hill School of Nursing, Chapel Hill, N.C.

John Gotelli is a geriatric NP at UNC Health Care, Hillsborough Campus, Hillsborough, N.C., and an adjunct clinical faculty member at The University of North Carolina at Chapel Hill School of Nursing, Chapel Hill, N.C.

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.

DOI-10.1097/01.NPR.0000577944.27349.66