Sleep Disruption in Older Adults

Harmful and by no means inevitable, it should be assessed for and treated.

OVERVIEW: Insomnia is not a normal part of aging, but nighttime sleep in older adults is often disrupted, leading to excessive daytime sleepiness and other physical, psychological, and cognitive changes that affect overall health. Even so, clinicians often pay little attention to sleep in this population. The sleep of older adults tends to be less deep than that of younger people, and coexisting conditions and treatment effects can more easily disrupt sleep. This article reviews the current literature on sleep disruption in older adults and suggests ways that nurses can apply the information in intervening to improve sleep in their older patients.

Shakespeare, in Macbeth, described sleep as “sore labour’s bath / Balm of hurt minds, great nature’s second course, / Chief nourisher in life’s feast.” And in Notes on Nursing, Florence Nightingale wrote that sleep was “all important” to the sick. Since then, research has increasingly supported this view. The cognitive and emotional benefits of restorative sleep include improved alertness, greater ability to learn new tasks and retain new skills, improved word recall, and less depression. A lack of adequate sleep, whether because the sleep is of poor quality or because a person gets too little of it, has been associated with compromised immune function, relationship disturbances, depression, hypertension, diminished alertness, higher numbers of falls in older adults, and a greater risk of accidents while driving. Sleep is as central to health as diet and exercise are.

Catherine Cole is an assistant professor at the University of Arkansas for Medical Sciences College of Nursing in Little Rock, where Kathy Richards is the Alice An Loh Sun Professor of Gerontology. Richards is also the associate director for health services research at the Geriatric Research, Education, and Clinical Center, Central Arkansas Veterans Healthcare System, Little Rock. Contact Author: Catherine Cole, colecatherine@uams.edu. This article presents the findings and conclusions of the authors and does not represent the views of the Department of Veterans Affairs (VA) or the VA’s Health Services Research and Development Service. The authors of this article have no significant ties, financial or otherwise, to any company that might have an interest in the publication of this educational activity.
In an epidemiologic study with a sample size of more than 9,000 participants, 23% to 34% of older adults reported having insomnia at least a few nights per month. Although the normal physiologic changes associated with aging can cause a greater number of early-morning awakenings, more difficulty in falling asleep, and less time sleeping deeply, disrupted sleep and excessive daytime sleepiness should not be accepted as an inevitable aspect of aging.

Sleep disruption in older adults is most often caused by pain or discomfort resulting from illnesses such as arthritis, pulmonary and gastrointestinal diseases, and diabetes but can also result from depression and loneliness, the effects of medications such as anticholinergics and antidepressants, primary sleep disorders (sleep apnea, restless legs syndrome, and advanced sleep-phase syndrome), and poor sleep habits such as taking long naps or drinking coffee or alcoholic beverages before bed.

A recent study published in the *American Journal of Geriatric Psychiatry* found that while 69% of older adults reported at least one sleep complaint, physicians had noted these complaints in the patient’s chart only 19% of the time. Clinicians must become more responsive to sleep disruption in older people and more aware of its close ties to health and illness.

**SLEEP AND ‘NORMAL’ AGING**

Insomnia can be categorized as primary or secondary. Primary insomnia is defined by the American Psychiatric Association as a “complaint of difficulty initiating or maintaining sleep or of nonrestorative sleep.” The change in circadian rhythms seen in older adults may result from changes to the suprachiasmatic nucleus in the hypothalamus, whereby messages from the region are either not sent or not received properly.
sleep that lasts for at least one month and causes clinically significant distress or impairment in social, occupational, or other important areas of functioning,” and is not associated with another disorder. Primary insomnia is relatively rare; most complaints of insomnia are associated with another disorder and are thus considered secondary.

**Age-related changes in sleep.** There’s no precise definition for what constitutes a “good night’s sleep.” Different people have different needs, but most adults of all ages need about eight hours of sleep nightly to feel rested and alert. And aging leads to changes that can affect patterns of sleep, making it harder to fall and stay asleep and causing the sleep that is obtained to be lighter and less restorative.

**Sleep depth.** Normal human sleep consists of rapid eye movement (REM) sleep (this is when we dream) and non-REM sleep. Non-REM sleep is further categorized into four stages: light sleep (stage 1) and progressively deeper levels of sleep (stages 2, 3, and 4). The term “sleep architecture” is used to describe the way in which an episode of sleep alternates between non-REM and REM sleep in approximately 90-minute cycles throughout the night. As a person ages, the proportion of time spent in deep sleep (stages 3 and 4, the most restorative stages of sleep) decreases, while that spent in light sleep (stage 1) increases; at the same time, the proportion of time spent in REM sleep decreases slightly (by 2% to 3%), but the meaning of this reduction is unclear.

**Sleep efficiency** is the ratio of time spent in bed to time spent asleep. As people grow older, sleep becomes less efficient—that is, they may need to spend more hours in bed to achieve the same amount of restorative sleep as when they were younger. At age 45, the average sleep efficiency is 85%; this declines to 79% in those over age 70.10 A “good night’s sleep” is one in which sleep comes readily and is sustained throughout the night. Even healthy older adults without a sleep disorder may have difficulty falling asleep (longer sleep latency) and have as many as 15 arousals per hour during the night and awaken early. (An arousal differs from an awakening in that it is very brief and often not remembered.)

**Disrupted circadian rhythms.** When older adults report early-morning awakenings, they may be what’s called phase advanced. That is, their 24-hour rest–activity cycle or circadian rhythm is disrupted so that they have difficulty staying awake until an appropriate bedtime and then, after falling asleep early in the evening, they awaken very early in the morning and are unable to return to sleep. Even in older adults who are not phase advanced, sleep is easily disrupted, especially during the second half of the night, and the result is early-morning awakening.

In healthy people of all ages, mental and physical function, including neurobehavioral performance and metabolism, fluctuate in a pattern that nearly matches a 24-hour rest–activity pattern (circadian rhythm) and that is also influenced by the level of fatigue resulting from prior hours of wakefulness (sleep homeostasis). For example, reaction time to visual stimuli may be best in the morning after a night’s sleep and gradually slow as the day progresses and fatigue increases; a slowed reaction time makes driving less safe and falling more likely. Normal 24-hour rest–activity patterns can easily be disrupted, and for many reasons; in one case, researchers found that when environmental cues, such as light and dark, are eliminated in a laboratory setting, natural 24-hour sleep–wake rhythms are disrupted and, in most people, are gradually transformed into a 25-hour cycle. The change in circadian rhythms seen in older adults may result from changes to the suprachiasmatic nucleus in the hypothalamus, whereby messages from the region are either not sent or not received properly.

**HEALTH CONDITIONS AND SLEEP DISRUPTION**

Coexisting illnesses are responsible for a significant proportion of sleep disruption. In 2003, 62% of people in the United States over the age of 65 had at least two or more comorbidities. In 2003 the National Sleep Foundation conducted telephone interviews with 1,506 older adults ages 55 to 84 years and concluded that sleep complaints in older adults are frequently secondary to comorbid conditions. The relationship between comorbid conditions and sleep is often bidirectional: health problems put older adults at risk for sleep disruption, and sleep disruption may be a risk factor for future health problems. Sleep quality should be assessed in older adults with any type of illness, and older adults presenting with sleep disruption should be assessed for illness. Although the exact interaction between sleep disruption and coexisting health problems is not always clear, a cycle of nonrestorative nighttime sleep and impaired daytime mental and physical functioning is now being shown to affect the quality of a person’s of life and work performance, to increase the risk of injury, and to lessen the nighttime secretion of important hormones, the nighttime lowering of blood pressure, and the consolidation of short-term memories to long-term memories.

**Pain** and sleep disruption have a close relationship. One group of researchers surveyed a convenience sample of 102 hospitalized patients to examine factors that disturbed sleep. Participants reported that pain and inability to get comfortable and perform a familiar nighttime routine were moderately disturbing to sleep. The researchers concluded that nurses can alter many of the factors that disturb sleep in the hospital and promote an environment that is conducive to sleep.
patients on a burn unit found that patients who had pain at night had degraded sleep and more nightmares, took more anxiolytic medications, and had more intense pain during procedures. Although information taken from patients with fibromyalgia or burns can only be extrapolated with caution to other populations, these results do point to the importance that pain control plays in sleep.30 Other painful conditions prevalent among older adults, such as arthritis, neuropathy, and pulmonary conditions, often cause sleepless nights. Nurses who care for patients with these conditions should intervene to control pain and optimize sleep.

While pain can worsen the quality of sleep, inadequate sleep can also intensify pain. A recent experiment carried out by Roehrs and colleagues demonstrated that the loss of four hours’ sleep resulted in increased sensitivity to pain.31 And nurse researchers who disrupted sleep in stages 3 and 4 on consecutive nights found that participants with fibromyalgia reported a greater sensitivity to pain, reported more discomfort and fatigue, and had an inflammatory flare response on their skin.

Delirium is the result of a pathological process outside the nervous system (such as infection, a metabolic disorder, or a drug reaction) and is frequently associated with sleep disruption as either a risk factor or symptom.32 It’s an acute or subacute alteration in previously normal or baseline mental function that’s temporary and reversible; in some cases it has a sudden onset. Symptoms include restlessness, anxiety, irritability, distractibility, and sleep disturbance.

The first priority in caring for an older adult with delirium is to identify and treat the underlying cause or causes. Because polypharmacy may lead to delirium, nonessential medications should be discontinued and the use of as-needed medications minimized. Nonpharmacologic interventions to improve sleep play a central role in the treatment of these patients (see Table 1, page 44); such measures include reorienting the patient, engaging her or him in stimulating daytime activities, changing the lighting to correspond to daytime and nighttime patterns, controlling the noise level (neither too much nor too little), keeping a clock and calendar in the room, massaging the back, bathing in warm water at bedtime, and limiting nighttime interventions.

Dementia can lead to several types of sleep disruption, including an increased number of nighttime awakenings, less efficient sleep, increased daytime napping, altered proportions of REM and non-REM sleep, and increased latency to the first episode of REM sleep.33-37 One study that used subjective reports from people with dementia found that 10% to 20% of sleep occurred during the daytime,35 and another study that used 72 continuous hours of polysomnography (the monitoring of physiologic parameters during sleep) found that patients with severe dementia had more disrupted sleep than elderly patients without dementia.37 Unfortunately, in standards of care for people with dementia, sleep often is not mentioned. The American Academy of Neurology’s guidelines on detecting, diagnosing, and managing dementia noted that no class I evidence could be found for the pharmacologic treatment of sleep disturbances in dementia, and research on nonpharmacologic treatments is needed.38 One possible cause of sleep fragmentation in people with dementia is damage to the neuronal pathways that initiate and maintain sleep and regulate cognitive arousal and sleep–wake cycles.39, 40 Cholinesterase inhibitors, a class of drugs used to treat the cognitive symptoms of dementia that includes donepezil (Aricept) and galantamine (Razadyne), are another cause of sleep disruption in people with dementia.41

IF TOTAL DARKNESS AND SILENCE ARE NOT FEASIBLE IN CLINICAL SETTINGS, PATIENTS CAN USE EARPLUGS AND A MASK.

For many caregivers, disrupted sleep—both their own and that of the people they’re caring for—is the primary reason for placement of the person with dementia into long-term care.42 Metabolic syndrome is a set of risk factors (insulin resistance, obesity, elevated low-density lipoprotein cholesterol levels, elevated triglyceride levels, hypertension, and type 2 diabetes) that has been associated with an increased risk of heart attack. Type 2 diabetes has been independently associated with daytime sleepiness, and evidence is growing that sleep apnea, inflammation, and insulin resistance—contributors to the development of atherosclerosis and cardiovascular disease—are also associated with daytime sleepiness.43 Researchers with the Sleep Heart Health Study examined the association of sleep time with diabetes mellitus and impaired glucose tolerance in 1,486 adults older than age 53. They found a higher prevalence of diabetes mellitus and impaired glucose tolerance among people whose sleep duration was six hours or less or nine hours or more.

Although some researchers hypothesize that disturbed sleep may lead to glucose intolerance and other elements of metabolic syndrome,44 the association may be bidirectional. For example, people with heart disease may be awakened by shortness of breath and chest pain. Diuretics may also contribute to sleep disruption because of excessive nighttime
Cancer patients often report fatigue, but the cause of the fatigue is not completely understood and is often attributed to depression or anemia resulting from treatment. But researchers who investigated the relationship between hemoglobin levels and fatigue in patients with colorectal, lung, or ovarian cancer who were undergoing chemotherapy and had mild or no anemia concluded that anemia only partially explained the experience of fatigue and that other symptoms such as sleep disruption were also significantly associated with urination. Sustained-release nitroglycerin may be indicated to resolve nocturnal cardiac ischemia and improve sleep, and excessive nighttime urination resulting from diuretic therapy can be remedied with morning administration of diuretics and evening fluid restriction. If patients with diabetes report early-morning awakenings and unpleasant dreams or nightmares secondary to hypoglycemia, a bedtime snack containing carbohydrates or careful evaluation and adjustment of insulin or hypoglycemic agents can improve sleep.

<table>
<thead>
<tr>
<th>Category</th>
<th>Intervention</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary</td>
<td>Limit caffeine (coffee, tea, soft drinks, and chocolate) to 2 caffeinated drinks per day, none after lunch.</td>
<td>Caffeine promotes wakefulness by blocking adenosine receptors in the brain.</td>
</tr>
<tr>
<td>Schedule</td>
<td>Adhere to a regular schedule for meals and sleep, using an alarm, if necessary, to ensure falling asleep on time. Limit naps to one 30-minute, early-afternoon nap.</td>
<td>Maintaining temporal patterns of rest and activity enhances synchrony with circadian rhythms. Excessive daytime napping weakens the homeostatic drive to sleep.</td>
</tr>
<tr>
<td>Environment</td>
<td>Maintain daytime light and nighttime dark. Keep the sleep environment dark.</td>
<td>Circadian rhythms are established primarily by patterns of light and dark.</td>
</tr>
<tr>
<td>Activities</td>
<td>Maintain an active physical and social daytime schedule. Avoid passive activities such as watching television.</td>
<td>Vigorous activity promotes daytime arousal, prevents napping, and lessens depression, which can disrupt sleep.</td>
</tr>
<tr>
<td>Delirium</td>
<td>Frequently reorient the patient by keeping a clock and calendar in the room and maintaining a regular schedule and associated light and dark patterns.</td>
<td>These measures decrease anxiety.</td>
</tr>
</tbody>
</table>
fatigue.46 And a small sample of patients with cancer reported significantly poorer overall sleep quality and greater daytime dysfunction than healthy controls did. Further investigation of sleep problems in patients with cancer is needed.47

Hospitalization. A qualitative study of hospitalized older adults found that they wanted nurses and physicians to manage their pain and their sleep.48 Because the sleep of older adults is lighter, it may be more easily disrupted in the hospital. A study that measured patients’ sleep two days before and two days after outpatient surgery found that after surgery 23% of the patients reported clinically significant sleep disruption, characterized by more wakefulness and pain and less energy.49 Sleep can be severely disrupted in hospitals because of noise, lighting, and routine care; one study that examined environmental noise in the ICU found that patient care more often resulted in awakenings than environmental noise did.50

Nurses who are with a patient through the night should maintain an environment conducive to good sleep—one that is cool, dark, and quiet. Nurses can adjust the thermostat and lights and organize their nursing care in such a way that interruptions are minimized. If total darkness and silence aren’t feasible, earplugs and a mask can be given to patients. If the physician orders frequent recording of vital signs, the nurse can ask whether the intervals can be lengthened to allow for sleep cycles of at least 90 minutes. Find out the patient’s usual bedtime and encourage her or him to begin preparing for sleep at least 30 minutes ahead of time. Ask what her or his usual bedtime routine is and try to replicate it as closely as possible. For example, does it include bathing, face washing, quiet reading, listening to music, or praying? Give warm milk to those who want it. Milk contains tryptophan, an amino acid that promotes sleep. Finally, when all preparations for sleep are complete, hang a “Do Not Disturb” sign on the door.

SLEEP DISORDERS
The most common sleep disorders in older adults are obstructive sleep apnea, advanced sleep phase syndrome (described above), and restless legs syndrome.

Obstructive sleep apnea, when breathing stops during sleep because of airway obstruction caused by tissue blockage, is the most common sleep disorder. It has been reported to occur in 11% to 62% of older adults, and its prevalence increases with age.51 Hypoxemia and sleep disruption may occur as many as 100 times per night as part of a cycle of snoring, airway occlusion, hypopnea (decreased rate and depth of breathing), and apnea (absence of breathing). An overnight sleep study in a person with obstructive sleep apnea will show at least five and often many more instances of obstructed breathing per hour.52

Current Medicare guidelines on the diagnosis of obstructive sleep apnea include an apnea–hypopnea index of at least 15 events per hour, with all episodes of hypopnea associated with at least a 4% decrease in oxygenation as measured on pulse oximetry.53 Clinicians often recognize obstructive sleep apnea only when the patient receives treatment for another condition, such as hypertension, myocardial infarction, congestive heart failure, stroke, or diabetes. The patient’s only complaints may be excessive daytime sleepiness or snoring. Evidence links obstructive sleep apnea to many adverse outcomes. For example, using a case–control design, researchers found that postoperative complications occurred at a higher rate (39%) in patients with obstructive sleep apnea than in a group of matched controls (18%).54 The condition has been identified as a risk factor for increased perioperative morbidity and longer hospital stay in older adults undergoing hip- or knee-replacement surgery.54 It’s also common in patients who have had a stroke, and one group of researchers reported an association with worse functional impairment and longer periods of hospitalization and rehabilitation.55 A review of studies published on the health care costs associated with obstructive sleep apnea reported that undiagnosed sleep apnea nearly doubled medical expenses.

One study that examined noise in the ICU found that patient care more often resulted in awakenings than environmental noise did.

Treatments for obstructive sleep apnea include weight loss, positional therapy, and the use of a continuous positive airway pressure (CPAP) device. Because many people have difficulty adhering to CPAP therapy even with repeated equipment adjustment and encouragement from clinicians, use of other therapies may be preferred. Supplementation with oxygen may minimize hypoxemia. Because many cases of obstructive sleep apnea are associated with obesity, weight loss is highly recommended in all obese patients. In less severe cases, the patient’s breathing and sleep may be improved by sleeping on her or his side.56

Restless legs syndrome is a sensorimotor disorder that affects from 2.5% to 15% of the population.57 Diagnosis involves patient report of four symptoms: • an impulse to move the legs, usually accompanied by unpleasant leg sensations • leg sensations that begin or worsen during rest or inactivity, such as lying or sitting
hospitalization can cause the symptoms to worsen. Because restless legs syndrome is thought to involve abnormalities in iron metabolism and the dopaminergic system, evaluation and replacement of serum ferritin is the first line of intervention, particularly in older adults, in whom the syndrome is most strongly related to low serum ferritin levels. Pharmacologic interventions may also include levodopa and dopamine agonists. Nonpharmacologic interventions include counseling patients to avoid caffeine, nicotine, and alcohol, which have been associated with an aggravation of symptoms. Although there have been no large randomized clinical trials studying nonpharmacologic interventions, anecdotal evidence suggests that massage, warm baths, and exercise can help.

**WHAT CAN NURSES DO?**

Assessment is essential to any successful care plan, beginning with a review of systems that affect sleep quality. Older adults often believe that poor sleep is to be expected, so it’s more effective to ask them specific, probing questions rather than a general question like “Do you sleep well?” Several tools are available to guide the interview. The Pittsburgh Sleep Quality Index (PSQI) inquires about seven areas of sleep: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep-inducing medications, and daytime dysfunction in the previous month. Scoring is based on a 0-to-3 scale; a score of 5 or more indicates poor sleep quality. It’s important to include the patient’s caregiver or bed partner in the assessment of snoring, periodic limb movements, and other nocturnal behaviors. The PSQI also includes several questions that request information from the older adult’s bed mate or roommate; it can be accessed at [www.geronurseonline.org/uploaded_documents/The%20Pittsburgh%20Sleep%20Quality%20Index.pdf](http://www.geronurseonline.org/uploaded_documents/The%20Pittsburgh%20Sleep%20Quality%20Index.pdf).

The Epworth Sleepiness Scale (see Epworth Sleepiness Scale, at left) is a shorter assessment tool that busy clinicians may also find helpful. Used to gauge daytime sleepiness, the questionnaire asks the patient to rate the chance that she or he would doze off in eight common situations. A score of 10 or more is considered sleepy. A score of 18 or more is very sleepy. Patients who score 10 or more may not be getting adequate sleep, may need to improve sleep hygiene, and may need to see a sleep specialist.

Use the following scale to choose the most appropriate number for each situation:

- **0 = would never doze or sleep.**
- **1 = slight chance of dozing or sleeping**
- **2 = moderate chance of dozing or sleeping**
- **3 = high chance of dozing or sleeping**

<table>
<thead>
<tr>
<th>Situation</th>
<th>Chance of dozing or sleeping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting and reading</td>
<td></td>
</tr>
<tr>
<td>Watching TV</td>
<td></td>
</tr>
<tr>
<td>Sitting inactive in a public place</td>
<td></td>
</tr>
<tr>
<td>Being a passenger in a car for an hour or more</td>
<td></td>
</tr>
<tr>
<td>Lying down in the afternoon</td>
<td></td>
</tr>
<tr>
<td>Sitting and talking to someone</td>
<td></td>
</tr>
<tr>
<td>Sitting quietly after lunch (no alcohol)</td>
<td></td>
</tr>
<tr>
<td>Stopped for a few minutes in traffic while driving</td>
<td></td>
</tr>
</tbody>
</table>

**Total score**

(This is your Epworth score)

© 2004 University of Maryland Medical Center. Adapted with permission.

- leg sensations that are somewhat or entirely relieved by movement, such as walking or stretching
- leg sensations that worsen in the evening or at night or occur only in the evening or at night

Patients with restless legs syndrome report unpleasant sensations such as “pins and needles” in the legs that can be relieved only by vigorous activity. This condition may occur more frequently in older adults, whose symptoms are often more severe and debilitating. The disorder is associated with severely disrupted sleep and is most often characterized by patients’ repetitive leg movements when sleeping, referred to as periodic limb movements. These movements can cause frequent awakening and disrupt sleep. The inactivity of enforced bed rest during

© 2004 University of Maryland Medical Center. Adapted with permission.

The Epworth Sleepiness Scale (see Epworth Sleepiness Scale, at left) is a shorter assessment tool that busy clinicians may also find helpful. Used to gauge daytime sleepiness, the questionnaire asks the patient to rate the chance that she or he would doze off or fall asleep in eight common situations.

If screening suggests the presence of sleep apnea or restless legs syndrome, refer the patient for further assessment. Because thyroid disorders are often associated with sleep disruption, hyperthyroidism should be considered. Polysomnography may be needed to confirm a diagnosis of periodic limb movement disorder or obstructive sleep apnea.

**The plan of care.** Reserve pharmacologic interventions for cases in which nonpharmacologic interventions do not work. Because the use of benzodiazepines and other hypnotic medications by older adults may increase the risk of falls, excessive daytime sleepiness,
confusion, and a decline in functional status. They should be used only in low doses for short periods of time (seven to 10 days) and as a last resort. The majority of sleep disruptions are most frequently caused by poor sleep hygiene and other health problems that can be remedied without the use of hypnotics. If all else fails, zolpidem (Ambien) or zaleplon (Sonata), non-benzodiazepine hypnotics, may help to establish a regular sleep pattern without daytime sleepiness. If sleep medications have been prescribed, assess whether the older adult is having trouble falling asleep or staying asleep and convey this information to the prescriber.

Not all sedatives work the same way. Encourage a person who’s unable to fall asleep after 30 minutes to get out of bed, if possible, and engage in a relaxing activity such as reading or listening to music until drowsiness arrives.

Nonpharmacologic interventions to improve sleep are supported by a growing body of evidence. Such approaches are supported by the two-process model of sleep, which posits that the drive to sleep and the ability to stay awake are regulated through the interaction of 24-hour circadian rhythms and the duration of prior wakefulness. Both processes contribute to the transition between wakefulness and sleep, and in healthy adults these processes contribute to stable behavioral states of alert daytime wakefulness and sound nighttime sleep. Since in older adults many factors, such as pain or anxiety, can disturb these processes and disrupt sleep, nonpharmacologic interventions to improve sleep frequently target the anxiety and pain in an attempt to indirectly improve sleep.

Nursing interventions for sleep promotion that focus on the body–mind connection, such as back massage, relaxing music, imagery, and muscle relaxation, are potentially effective, although further study is needed. Another effective intervention—based on the hypothesis that decreased core body temperature is important for good sleep in anyone—is a warm bath before bedtime. Evidence shows that when a warm bath precedes bedtime by as little as 30 minutes, the usual circadian drop in body temperature is intensified and sleep is enhanced. One study that investigated the effect of bathing on the quality of sleep in 30 older adults (ages 65 to 83 years) and 30 young people (ages 17 to 22 years) found that the group that had a warm bath before bedtime slept better. During the first three hours of sleep, body movements were less frequent, suggesting that the time to fall asleep shortened and the proportion of time spent in deep sleep lengthened.

Sleep processes can be affected by factors including diet, alcohol and drug use, noise, light, daytime napping, social activity, exercise, time spent in bed, and sleep schedule. Nonpharmacologic nursing interventions can be effective in helping to change such factors (see Table 1, page 44). When patients have difficulty sleeping, a thorough assessment should be made to explore all aspects of sleep hygiene.

Additional resources can be found at the National Sleep Foundation Web site: www.sleepfoundation.org.
REFERENCES


