Sleep Disorders

CLINICAL PRACTICE GUIDELINE

PALTmed
POST-ACUTE AND LONG-TERM CARE MEDICAL ASSOCIATION

Panel Members:
***Charles A. Cefalu, MD, MS— Chair**
*Harlan Martin, R.Ph, CCP, FASCP—Co-chair
Jim Byars, BS Pharm, CGP, FASCP
Roxanne Dean, L.S.W.
Darlene Field, L.S.W.
*Hosam Kamel, MD, CMD
Susan Ledbetter, DO
Christy Meade, CNA
Teresa Mosoti, RNC
Bob Murphy, RN, CRRN
Marjorie Simpson, MS, CRNP
Clifford Milo Singer, MD

* Steering Committee Member

Technical Writer:
Eleanor Mayfield

PALTmed Staff:
Jacqueline Vance, RN, C. CDONA/LTC, CPG Project Manager, Director of Clinical Affairs
Pamela Kumar, RN, BSN, Project Manager-Clinical Affairs

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Preface

This clinical practice guideline (CPG) has been developed under a project conducted by the Post-Acute and Long-Term Care Medical Association (PALTmed), the national professional organization representing attending physicians and medical directors who care for patients in the long-term care setting. This is one of a number of guidelines undertaken as part of the association's mission to improve the quality of care delivered to patients in these settings.

Original guidelines are developed by interdisciplinary workgroups, using a process that combines evidence and consensus-based approaches. Workgroups include practitioners and others involved in patient care in long-term care facilities. Beginning with a general guideline developed by an agency, association, or organization such as the Agency for Healthcare Research and Quality (AHRQ), pertinent articles and information, and a draft outline, each group works to make a concise, usable guideline that is tailored to the long-term care setting. Because scientific research in the long-term care population is limited, many recommendations are based on the expert opinion of practitioners in the field. A bibliography is provided for individuals who desire more detailed information.

Guideline revisions are completed under the direction of the Clinical Practice Guideline Steering Committee. The committee incorporates information published in peer-reviewed journals after the original guidelines appeared as well as comments and recommendations not only from experts in the field addressed by the guideline but also from "hands-on" long-term care practitioners and staff.

Purpose

PALTmed seeks to develop and revise guidelines that focus on specific concerns and common problems in the long-term care setting. Although AHRQ and other agencies, organizations, and associations have developed a number of guidelines for condi-tions that occur in elderly and chronically ill individuals, many of these guidelines limit or omit considerations that are unique to the long-term care population.

PALTmed guidelines emphasize key care processes and are organized for ready incorporation into facility-specific policies and procedures to guide staff and practi-tioner practices and performance. They are meant to be used in a manner appropri-ate to the population and practice of a particular facility. Guideline implementation will be affected by resources available in the facility, including staffing, and will require the involvement of all those in the facility who have a role in patient care.

Audience

This guideline is intended for the members of the interdisciplinary team in long-term care facilities, including the medical director, director of nursing, physicians, nursing staff, consultant pharmacist, and other professionals such as therapists, social workers, dietitians, and nursing assistants who care for residents of long-term care facilities.

PALTmed CPGs include many functions and tasks related to recognizing, clarifying, managing, and monitoring various conditions and situations. But the guidelines only sometimes specify who should do these tasks. For example, many disciplines includ-ing nursing assistants, licensed nurses, dieticians, and social workers may make and document observations (e.g., that someone does not sleep at night, is more with-drawn, or has a change in usual eating patterns). But only some of them may be qual-ified to determine the significance of those observations (for example, what is caus-ing the sleeplessness or change in eating patterns). In contrast, physicians and nurse practitioners may not be present to make observations, but are trained to analyze the significance and causes of symptoms. Thus, each facility should ensure that tasks are done correctly and by appropriate interdisciplinary team members. It is important for observers to make and document findings effectively, but they should get appropri-ate support for interpreting the findings when this is not within the scope of their training or practice.

Assumptions

Guidelines in the long-term care setting should be consistent with fundamental goals of desirable long-term care practice. Operationally, this requirement means that the nursing facility care team systematically addresses (1) each individual's risk factors for a number of diseases and conditions and (2) the adverse consequences of the diseases and conditions on the patient's functioning and quality of life.

However, when nursing facility patients are at or near the end of life, care goals will shift from functional improvement or physical stability to palliation or comfort care. PALTmed guidelines address this transition and provide suggestions for appropri-ate modification of the patient's care plan.

Long-term care facilities care for a variety of individuals, including younger patients with chronic diseases and disabilities, short-stay patients needing postacute care, and very old and frail individuals suffering from multiple comorbidities. When a workup or treatment is suggested, it is crucial to consider if such a step is appropriate for a specific individual. A workup may not be indicated if the patient has a ter-minal or end-stage condition, if it would not change the management course, if the burden of the workup is greater than the potential benefit, or if the patient or his or her proxy would refuse treatment. It is important to carefully document in the patient's medical record the reasons for decisions not to treat or perform a workup or for choosing one treatment approach over another.

How to Use These Guidelines

Each guideline includes a narrative portion that covers definition, recognition, assess-

ment, treatment, and monitoring of the condition being addressed. "Recognition" means identifying the presence of a risk or condition. "Assessment" means clarifying the nature and causes of a condition or situation and identifying its impact on the individual. "Treatment" means selecting and providing appropriate interventions for that individual. "Monitoring" means reviewing the course of a condition or situation as the basis for deciding to continue, change, or stop interventions.

Each guideline also includes an algorithm that summarizes the steps involved in addressing the condition. In the algorithm, rectangles signify points where action is to be taken; diamonds indicate points where a decision must be made.

Terminology

We recognize that people who reside in long-term care facilities are "residents". However, we have used the term "patient(s)" throughout these guidelines because we are addressing individuals within the context of treating a medical condition. In addition, these guidelines apply substantially to individuals who come to long-term care facilities for short-term care. When referring to pharmaceutical products, we have avoided the use of brand names and refer to classes of drugs whenever possible.

Sleep Disorders
in the Long-Term Care Setting

DEFINITION

Sleep disorders are characterized by difficulty in initiating or maintaining sleep at night, difficulty in maintaining wakefulness during the day, or abnormal behavior associated with sleep, all of which are subjectively or objectively distressing or harmful to the patient or the patient's roommate or sleep partner.

This clinical practice guideline focuses on the evaluation and management of sleep disorders that are secondary to chronic medical conditions or environmental issues. Most sleep disorders in the long-term care setting fall into this category. The management of primary sleep disorders (e.g., central or obstructive sleep apnea, restless legs syndrome, periodic limb movement during sleep) in the long-term care setting is beyond the scope of this guideline.

Sleep disorders are generally classified into syndromes of insomnia, hypersomnia, and parasomnia.

Insomnia is characterized by difficulty falling asleep, difficulty staying asleep, early awakening, or nonrestorative sleep that results in impaired physical, social, or cognitive function.

Hypersomnia is increased sleepiness, usually manifested as excessive daytime sleepiness that causes distress or impairment of function. Primary hypersomnia is rare in the long-term care setting and is beyond the scope of this guideline.

Parasomnias are disorders characterized by abnormal sleep-related behaviors, including nightmares, sleep terrors, and sleepwalking. The treatment of primary parasomnia is beyond the scope of this guideline.

Twilight psychosis, or "sundowning" (increased confusion or restlessness late in the day), is not a sleep disorder. Please refer to PALTmed's clinical practice guideline on dementia[a] for further discussion of twilight psychosis.

INTRODUCTION

Sleep problems are extremely common among residents of long-term care facilities.[1,2] Sleep disturbance and its behavioral consequences in patients with dementia are a common reason for admission to long-term care.[3,4] Falls and subsequent injury may be a consequence of sleep disorders.[5,6]

[a] Post-Acute and Long-Term Care Medical Association. Dementia. Clinical Practice Guideline. 2005 (revised). Columbia, MD.

Scope of the Problem

Data on the prevalence and natural history of sleep disorders in the long-term care setting are scarce; most data come from studies of community-dwelling elderly people. The data suggest that age-related sleep changes, medical conditions common among older people, medications that affect sleep, substance use, and factors related to the long-term care facility environment all contribute to the prevalence of sleep difficulties in the long-term care population. About 50 percent of community-dwelling elders complain of some form of sleep difficulty.[7] The prevalence of daytime napping in the elderly ranges from 25 percent to 80 percent.[8] About 14 percent of elders habitually use sleep agents.[9]

Age-related sleep changes. Age-related sleep changes (Table 1) may partly explain the prevalence of sleep problems among long-term care patients.[10] Changes in sleep are common as people age, although evidence suggests that the major problems associated with sleep in the elderly are secondary to diseases rather than a result of aging itself.[11] Minor age-related sleep changes (e.g., earlier morning awakening, reduction of total sleep time, increased napping) that do not disrupt usual activities are considered normal and do not require assessment or treatment.[12]

Insomnia. Insomnia is the most common sleep complaint in older adults.[8,13,14] Surveys indicate that 15 percent to 75 percent of elderly persons residing at home or in an extended-care facility are dissatisfied with either the duration or the quality of their nocturnal sleep.[15] Rates of insomnia are typically 20 percent to 50 percent higher in women than in men. Previous insomnia is a risk factor for recurrent insomnia.[14]

Experts on sleep disorders agree that insomnia is a symptom, not a diagnosis. Insomnia in older adults is usually multifactorial.[8,9] In the long-term care setting, acute insomnia is transient and is related to environmental or psychologic stress, medication use, or exacerbation of an acute illness. Chronic insomnia (i.e., insomnia lasting longer than 3 weeks) is related to comorbid illness, pain, chronic medication use, depression, poor sleep hygiene, or combinations of these factors.

TABLE 1
Sleep Changes With Normal Aging

- Increased nocturnal awakening
- More time in bed with decreased time spent sleeping (i.e., sleep is less efficient)
- Earlier sleep onset and awakening
- Increased time to fall asleep
- Decreased deep sleep (Stages 3 and 4)
- Decreased REM* sleep
- Increased daytime napping

*REM: rapid eye movement

Adapted from Susman[9]

Common medical conditions. Considerable evidence from population-based studies supports an association between sleep problems and medical conditions common among older people. Poor sleep is most strongly associated with heart disease, depression, arthritis, and obesity.[16] Insomnia is associated with chronic health conditions, particularly conditions that cause chronic pain (e.g., arthritis), limited mobility (e.g., Parkinson's disease), or difficulty breathing (e.g., obstructive sleep apnea, chronic obstructive pulmonary disease [COPD]).[14] Gastroesophageal reflux, restless legs syndrome, and nocturia also may contribute to sleep disruption.

Several studies have shown that depression is a powerful risk factor for insomnia and that insomnia is a risk factor for later depression.[14] As many as 50 percent of people with a major depressive disorder report sleep problems.[13] Chronic insomnia is a significant, independent risk factor for cognitive decline for men who have no symptoms of depression. For women, chronic insomnia is associated with an increased risk of cognitive decline only in those who also have high levels of depressive symptoms.[13]

Insomnia is prevalent among patients with dementia.[17-20] Patients with advanced dementia may suffer from hypersomnia and severe sleep fragmentation; they may have frequent periods of sleep during the day and at night.[21] Compared with older persons without dementia, patients with dementia have more sleep disruption and arousal, lower sleep efficiency, a higher percentage of Stage 1 sleep, and a reduction in Stage 3 and Stage 4 sleep. Disturbances of the sleep-wake cycle are common in dementia, resulting in daytime sleep and nighttime wakefulness.

Hypersomnia. Among community-dwelling adults aged 65 and older, daytime sleepiness, difficulty falling asleep, and frequent awakenings increase in prevalence with age.[22] The prevalence of excessive daytime sleepiness in the elderly ranges from 10 percent to more than 30 percent.[23] Although excessive daytime sleepiness has not been clearly shown to result in increased mortality, it has been linked with cognitive impairment, COPD, dementia, depression, diabetes, falls, functional impairment, heart disease, limitations in activities of daily living, multiple medication use, obstructive sleep apnea, Parkinson's disease, poor health, and the use of benzodiazepines.[8,22-25]

Sleep problems related to use of medications and other substances. A variety of prescribed and over-the-counter medications, as well as substances such as alcohol, caffeine, and nicotine, can interfere with sleep. Alcohol may cause initial drowsiness, but it can impair sleep later in the night as blood alcohol levels decrease. Stimulants such as caffeine are another common cause of insomnia. Caffeine withdrawal is associated with hypersomnolence. Nicotine induces both insomnia and sleep fragmentation.[8]

Some sleep medications, particularly those that are relatively long acting, have multiple side effects in older people, including hypersomnolence, increased propensity for accidents, and disrupted sleep architecture. Tolerance tends to develop when long-acting sedatives are taken chronically, resulting in rebound insomnia and the need for higher dosages to achieve the same clinical effect.[8]

Environmental factors. Long-term care facilities, with their shared rooms, long

halls with hard surfaces that transmit noise, and numerous alarms and televisions, are not conducive to a good night's sleep.[10] One study reported that 42 percent of nighttime awakenings among long-term care residents were associated with noise, light, or both.[26]

The environments and policies of long-term care facilities may exacerbate some residents' chronobiological sleep disorders. Institutional schedules that require residents to go to bed, get up, and eat meals at prescribed times instead of at times they choose or to which they are habituated may be a contributing factor in sleep problems. Residents who go to bed at 7 or 8 p.m. because of boredom or because they are tired may wake up very early in the morning after sufficient sleep but complain of "insomnia" because they lie awake in bed for several hours before getting up.

Other factors. Many long-term care residents spend a large part of the day inactive or in bed; such inactivity may contribute to difficulty sleeping at night. They often lack exposure to sunlight, a situation that may disrupt circadian rhythms and add to sleep difficulties.[10]

Residents who are blind or have significant visual impairment may not be able to synchronize sleep cycles with day-night cycles, resulting in daytime sleepiness and nighttime wakefulness.[27] All of these factors tend to exaggerate normal age-related changes in circadian pacemaker function that drive sleep-wake cycles.[17]

Barriers to the Recognition, Assessment, and Optimal Management of Sleep Disorders in the Long-Term Care Setting

For a variety of reasons, patients with sleep disorders may not receive optimal care in long-term care facilities.

- Daytime sleepiness may not be recognized as a possible symptom of insomnia because frail, elderly people are mistakenly expected to be sleepy during the day.
- Staff may lack information about a patient's history of sleep problems.
- Patients may have difficulty communicating about a sleep problem.
- Staffing levels at night are lower than during the day and the night nursing staff may not be able to provide individualized attention to patients with sleep problems.
- Limited communication between night and day staff may mean that day staff are not informed that a patient is having difficulty sleeping at night.
- Facility management may not recognize sleep disorders as a problem. Caregiving staff may not be trained to observe and report symptoms that may indicate a sleep disorder.
- Trained staff and resources may be lacking to implement nonpharmacologic interventions for sleep disorders. Additionally, such interventions may not be reimbursable and may be deemed impractical.[15]
- Restrictive formularies and other regulatory issues may inhibit or complicate the treatment of patients with sleep problems.
- Sleep medications can cause oversedation and can contribute to falls and other adverse effects in frail, elderly patients.
- Practitioners may over-rely on medications to treat sleep problems and may not

help to investigate underlying causes. Sleep medications are generally intended for short-term or intermittent use only.

- Referrals to specialist sleep centers, even when appropriate, are problematic because of the limited availability of such centers, the logistical difficulties associated with transporting long-term care patients to them, the cost of specialist referrals, and the fact that sleep centers may not have the detailed information about the patient to allow them differentiate underlying causes.
- Policies and practices common to many long-term care facilities (e.g., institutionalized sleeping and waking schedules, the practice of waking patients at night to check vital signs or administer medication or other care, early-morning laboratory testing, noise and light at night that interfere with sleep) present unique problems for the implementation of appropriate sleep hygiene measures for patients who require them.
- Expectations of or orders for around-the-clock incontinence care may require staff to wake residents at night to manage incontinence rather than allow them to sleep without interruption.

Facility Preparedness

It is recommended that medical directors and managers of long-term care facilities adopt policies and procedures that enhance residents' ability to obtain a good night's sleep.

Staff education. Educate caregiving staff about the symptoms and consequences of sleep disorders and train them to recognize and report signs or behaviors that may indicate a sleep disorder. The education of nursing assistants is particularly important because of their position as front-line caregivers. It is advisable for practitioners, nurses, managers, and other staff to be educated about the importance of recognizing and appropriately managing sleep disorders.

Environmental enhancements. Actively encourage the reduction of noise and light during the night (e.g., turn off unwatched television sets, schedule noisy tasks such as vacuuming and floor polishing for daytime hours, use task lighting rather than overhead lights at night). Additionally, reconsider the necessity of care routines such as waking patients at night to toilet them or administer medication.

Individualized care planning. To the extent possible, enable patients to get up, go to bed, and eat meals at times of their choosing. Some people are accustomed to rising and going to bed early, whereas others prefer to stay up late at night and sleep late in the morning. Sleep difficulty that results from being required to go to bed or get up much earlier than one's customary time (due to an institutional culture that may emphasize uniform sleeping and waking times for all residents) is not a sleep disorder.

Interdisciplinary care management. Consider sleep quality an essential dimension of patient functioning. Ensure that sleep quality and sleep hygiene are routinely discussed at interdisciplinary patient care conferences and that comments and recommendations specific to individual patients' sleep needs are recorded in the interdisciplinary patient notes. Follow up on reports of changes in a patient's sleep pattern or behavior changes that suggest a patient may be having sleep problems.

Outcomes That May Be Expected From Implementation of This Clinical Practice Guideline

Most patients with sleep disorders in the long-term care setting can be appropriately assessed and treated without specialist referral using a stepwise approach that emphasizes nonpharmacologic techniques and that uses a combination of pharmacologic and nonpharmacologic therapies if the latter alone are unsuccessful.[15]

Outcomes that may be expected from the implementation of this guideline include:

- Better awareness and understanding of sleep disorders among patients and caregivers.
- Decreased long-term use of pharmacologic agents to promote sleep.
- Decreased use of pharmacologic sleep agents that may be inappropriate in a frail, elderly population.
- Greater acceptance of individualized scheduling (i.e., enabling patients to get up, go to bed, and eat meals at times of their choosing rather than at institutionally established times).
- Reduction in the frequency of daytime drowsiness, increased levels of participation in activities, improved social interaction, and enhanced quality of life for patients with sleep difficulties.
- Improved physical and cognitive function and fewer falls.
- Reduction in nighttime disruptive behavior caused by noise or bright lights.
- Reduction in distressed daytime behavior in patients with dementia.
- Decline in geriatric psychiatry referrals for evaluation of behavioral problems related to sleep disorders.
- Increased participation in rehabilitation programs and better rehabilitation outcomes.
- Increased job satisfaction among caregivers.

RECOGNITION

For the reasons mentioned above, caregiving staff should have a high index of suspicion for the presence of sleep problems.

STEP 1

Is a sleep disorder present? Signs and symptoms that may indicate the presence of a sleep disorder are listed in Table 2.

Upon admission or during the pre-admission assessment, ask the patient and family members about the patient's sleep habits, current or past sleep problems, and use of medications (including over-the-counter products and alternative remedies as well as prescription medications) to promote sleep. Document information about sleep habits in the patient's medical record.

Pay attention to patient complaints of poor sleep. Solicit third-party reports of sleep disturbance or changes in the patient's sleep pattern; for example, ask the patient's roommate or caregiver whether the patient snores, has periods of apnea or an arousal snort, talks in his or her sleep, or has episodes of confusion or combative-

TABLE 2

Signs and Symptoms That May Indicate the Presence of a Sleep Disorder

Nighttime Signs and Symptoms

- Apneic episodes and arousal snort
- Frequent awakenings
- Noticeable snoring
- Periodic, jerking limb movements during sleep or while lying awake in bed
- Uneven breathing patterns
- Vocalization (talking in sleep)
- Wandering

Daytime Signs and Symptoms

- Abnormal behavior in patients with dementia (e.g., agitation, hostility, combativeness)
- Complaints by roommate or family member
- Early-morning agitation, confusion, or headache
- Excessive daytime sleepiness or napping
- Falls
- Frequent accidents
- Functional decline
- Hypersomnia with functional impairment
- Impaired cognition or mental acuity
- Reduced alertness
- Reduced intake of food and fluids due to excessive sleepiness
- Reduced participation in activities
- Uncontrolled hypertension

ness during the night. Many long-term care residents complain of insomnia when they may simply be experiencing normal age-related changes in sleep. Determine whether the patient may have been given over-the-counter sleep aids without the knowledge of the nursing staff, pharmacist, or attending physician.[15]

STEP 2

Does the patient have risk factors for a sleep disorder? Most patients in the long-term care setting have multiple risk factors for sleep disorders (Table 3). Evaluate the patient for sleep problems during periodic scheduled assessments (Table 4) and whenever a change in clinical status occurs.

STEP 3

Offer interim measures to alleviate the sleep disorder. While assessment of the patient's sleep disorder proceeds, it is appropriate to offer interim measures that may promote good sleep hygiene and better sleep quality. *Avoid administering hypnotic medications until an adequate assessment has been performed.*

TABLE 3

Risk Factors for Sleep Disorders

- Bipolar disorder
- Delirium
- Dementia
- Depression
- Divorced or widowed status
- Elderly
- Female sex
- Functional impairment
- History of sleep disorders
- Inadequate
  - Exposure to sunlight
  - Family or social support
  - Physical activity
  - Self-esteem
  - Social stimulation
- Lower socioeconomic status
- Multiple comorbidities (e.g., COPD, CHF, osteoarthritis)
- Multiple medication use
- Neurologic disease (e.g., parkinsonism, restless legs syndrome)
- Newly admitted to a long-term care facility
- Pain
- Post-traumatic stress disorder
- Schizophrenia
- Use of specific medications or substances that interfere with sleep

COPD: chronic obstructive pulmonary disease; CHF: congestive heart failure

Environmental adjustments. Assess the patient's level of comfort with the room temperature or bed position. Adjust pillows and bedding to optimize comfort (e.g., add a blanket if the patient is cold, remove a blanket if he or she is too warm). Reduce lighting and noise that may be interfering with the patient's ability to sleep.

Individualized comfort measures. Assess the patient for pain. Offer toileting assistance. Offer a light snack, a cup of warm milk, or a back rub. Ask what is on the patient's mind that may be interfering with sleep. If the patient has recently been admitted, acknowledge that it is normal to feel some anxiety and offer reassurance. If the patient is ambulatory, suggest taking a brief walk, accompanied by a caregiver. Permit the patient to sit at the nursing station if the patient is fearful of being alone.

STEP 4

Define the characteristics of the sleep disorder and identify possible causes. Define the chief symptom of the patient's sleep disorder (e.g., difficulty falling asleep, freq

TABLE 4
Sleep-Related Questions in Minimum Data Set (MDS)-Version 3.0*

Section D0200-A
Trouble falling or staying asleep, or sleeping too much.

Section J0500-A
How much of the time have you experienced pain or hurting over the last five days?

Section N0400-D
Number of days during last 7 days that resident has received hypnotic medications

* Questions or section numbers may change in future revisions of the MDS.

quent nighttime awakenings, excessive daytime sleepiness, disruptive behavior during the day, uneven breathing pattern, or disturbed behavior during sleep).

Consider using a sleep diary, if the patient is able to complete one, or a sleep log completed by direct caregiving staff to determine the patient's sleep pattern (Tables 5 and 6). Such a diary or log can provide objective information to supplement subjective reports by the patient, family members, roommates, and caregivers. It enables objective assessment of total time in bed, total sleep time, and sleep quality; obtaining this information from patient and caregiver memory alone can be unreliable.[8] Although standard practice is to maintain a sleep log for 2 weeks, it may be more practical to do so for 3 consecutive days, followed by another 3 days a week or two later.

Validated sleep-rating scales also may be used to quantify subjective reports of sleep disturbance. The Pittsburgh Sleep Quality Index (Appendix 1) is a comprehensive questionnaire covering many types of sleep symptoms; it is easy to use and can be applied in the long-term care setting.[28] The Sleep Disorders Inventory (Appendix 2) was developed and validated for patients with dementia and has great utility in both home and long-term care settings.[29]

TABLE 5

Components of a Sleep Log

- Date and day of the week
- Timing of meals and quantity of food eaten
- Activities during the day, including timing and amount of physical activity
- Timing and amount of medications taken (including over-the-counter products and alternative remedies as well as prescription medications)
- Habits before going to bed (e.g., taking medication, consuming food or drink – especially alcohol or caffeine)
- Activities before bedtime (e.g., reading, watching television, socializing)
- Time of going to bed
- Time needed to fall asleep
- Quality of sleep, including awakenings and nightmares
- Dreams, snoring, or unusual movements during sleep
- Time of waking in the morning
- Feelings on waking in the morning (e.g., well rested, not well rested)
- Daytime sleepiness and naps

Adapted from Susman,[9] Kupfer and Reynolds[30]

TABLE 6

Sample Sleep Log

Patient name: _____

Week # _____

Dates: From _____ To _____

Sleep quality scale:

1. Poor night with very little restful sleep
2. Difficult night with many awakenings
3. Fair night with several awakenings
4. Good night with very few awakenings
5. Excellent night with no awakenings

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Lights-out time							
Time to fall asleep							
Final awakening							
Sleep quality							
Comments Record whether • sleeping pill taken? • unusual event occurred?							

TABLE 7
Comparison of Sleep-Disorder Assessment Tools

Tool	Advantages	Disadvantages
Patient-caregiver interview	Easy, quick, familiar	◆ Relies on recall of sleep symptoms
Sleep log, sleep-rating scales	Most reliable means of obtaining objective information	◆ Relies on recall of sleep symptoms ◆ Does not provide sleep-staging information ◆ Useful only for insomnia ◆ May not be reliable in less active patients or those with tremor, dyskinesia, or myoclonus
Polysomnography	Provides sleep-staging and diagnostic information for most types of sleep disorder	◆ Expensive ◆ Intrusive ◆ Requires sleep technicians to administer and sleep clinician with expertise to interpret results
Pulse oximetry (overnight use)	◆ Less intrusive ◆ Allows direct monitoring for evidence of hypoxemia, which might indicate sleep apnea	◆ Expensive ◆ Requires one-on-one monitoring and recording during the night

ASSESSMENT

Although the diagnostic process has been broken down into a number of steps, in practice some or all of those steps may be performed concurrently. The extent of the assessment may vary by patient. Table 7 summarizes the advantages and disadvantages of various sleep-disorder assessment tools.

STEP 5

Collect information and make direct observations pertinent to the patient's sleep disorder. Obtain a detailed medical and sleep history; pay particular attention to underlying medical conditions and medication use or misuse (Table 8).

TABLE 8

Evaluation of Elderly Patients With Sleep-Related Complaints

- Obtain sleep history (from patient, family members, caregivers, roommates).
- Determine characteristics of sleep.
  - History of sleep problems
  - History of snoring, sleep-disordered breathing, abnormal limb movements
  - Level of daytime alertness (e.g., sleepy, drowsy, lethargic)
  - Napping pattern
  - Number and duration of nighttime awakenings
  - Quality of sleep (e.g., restorative, refreshing)
  - Recent changes in sleep pattern
  - Time required to fall asleep
  - Times of going to bed and waking up
  - Total sleep time
- Rule out potential external factors.
  - Activity level, exercise
  - Diet (e.g., heavy, greasy, or spicy food; heavy meal shortly before bedtime)
  - Situational stressors
  - Use of medications, recent changes in medication regimen
  - Use of alcohol, caffeine
- Assess impact of problem.
  - Degree of functional impairment caused by sleep difficulties
  - Duration of sleep disturbance
- Perform pertinent physical examination.
- Observe patient during sleep.
- If a primary sleep disorder is suspected, consider specialist referral.

Adapted from Haponik and McCall[12]

For patients with nighttime sleep disturbance, it may be helpful to distinguish between sleep-onset problems and sleep-maintenance problems. Sleep-onset difficulties are often related to anxiety, changes in sleep architecture, poor sleep hygiene, and restless legs syndrome. Sleep-maintenance problems, by contrast, are often associated with chronic alcohol or medication use; medication side effects; depression; or a primary sleep disorder, such as sleep apnea.[9]

Nurses and nursing assistants should be trained to observe the symptoms of obstructive sleep apnea, restless legs syndrome, and periodic limb movement disorder. They should report their observations to a nursing supervisor, who should in turn report them to the patient's attending practitioner.

TABLE 9

Environmental, Behavioral, and Psychosocial Factors That May Contribute to Sleep Disorders

Environmental Factors

- Bright light
- Excessive noise
- Inflexible meal schedules
- Mattresses and pillows that are too hard or too soft
- Room temperature (too warm or too cold)
- Shift changes
- Timing of care processes
  - Bathing
  - Bed repositioning
  - Medication administration
  - Toileting
  - Tube feeding
  - Wound care and dressing changes
- Timing of housekeeping activities (e.g., vacuuming, floor polishing)

Behavioral Factors

- Activities that promote wakefulness (e.g., watching television in bed)
- Getting into bed too early
- Consumption of a heavy or spicy meal in the evening
- Excessive consumption of caffeinated beverages or alcohol shortly before bedtime
- Excessive fluid intake
- Long daytime naps
- Low levels of physical activity

Psychosocial Factors

- Adjustment to relocation
- Anxiety
- Bereavement
- Family discord, lack of family support
- Social isolation

STEP 6

Assess environmental, behavioral, and psychosocial factors that may be contributing to the sleep disorder. Environmental and other factors (Table 9) can frequently interfere with sleep. Evaluate those factors early in the assessment phase.

STEP 7

Assess medical conditions and medications that may be contributing to the sleep disorder. Because most patients in long-term care settings have multiple comorbidities,

TABLE 10

Some Medical Conditions and Symptoms Frequently Associated With Sleep Disorders in the Long-Term Care Population

- Allergies with nasal congestion
- Cardiovascular disorders (e.g., CHF, peripheral arterial disease)
- Chronic alcohol or drug abuse
- Endocrine disorders (e.g., severe hypothyroidism)
- Gastrointestinal disorders
- Infection (e.g., chronic sinusitis with postnasal drip, urinary tract infection)
- Menopause
- Pain
- Neurologic disorders (e.g., Parkinson's disease, painful diabetic neuropathy)
- Obesity
- Pruritus
- Psychiatric conditions (e.g., anxiety, depression, bipolar disorder)
- Pulmonary disorders and symptoms (e.g., asthma, COPD)
- Renal disorders (e.g., moderate to severe chronic kidney disease)
- Rheumatic disorders
- Sensory impairment (e.g., blindness)
- Urologic conditions (e.g., benign prostatic hyperplasia, urinary incontinence)

they are likely to have one or more conditions that may be associated with a sleep disorder. Insomnia that is secondary to nighttime pain, gastric reflux, or sleep-related breathing problems, along with excessive daytime sleepiness, often indicates a medical problem and should be brought to the attention of the attending practitioner. Table 10 lists medical conditions and symptoms that are associated with sleep disorders in the long-term care population. Table 11 offers examples of how common medical conditions may adversely affect sleep.

Most patients also take multiple medications, thereby increasing the likelihood that one or more medications may interfere with sleep (Table 12). When considering whether medications may be contributing to sleep problems, note the time of day at which drugs are administered. For example:

- Is a diuretic given just before bedtime, increasing the likelihood of nocturia?
- Are medications with sedating effects given during the day, promoting daytime sleepiness?
- Are medications that promote wakefulness given at night, contributing to difficulty falling asleep?

Table 13 lists distinguishing features of insomnia, hypersomnia, and parasomnia that should be considered when making a differential diagnosis of a sleep disorder.

TABLE 11
How Common Medical Conditions May Adversely Affect Sleep

Condition	Effect on Sleep
Congestive heart failure	Orthopnea, sleep-related breathing disorders (central and obstructive apneas), daytime sleepiness, nocturia
Delirium	Sleep-wake cycle fragmentation, hypersomnolence
Gastroesophageal reflux disease	Nighttime reflux or aspiration associated with arousals from sleep
Pain syndromes	Onset and maintenance insomnia
Neurodegenerative diseases	Sleep-wake cycle fragmentation, hypersomnolence

STEP 8

Consider whether specialist evaluation of the sleep disorder is indicated. Consider a specialist evaluation for a frail elderly patient with a suspected primary sleep disorder. Referral to a sleep specialist (Table 14) may be indicated when:

- Obstructive sleep apnea is suspected.
- The patient has symptoms of restless legs syndrome or periodic limb movement disorder or has limb jerking at night that is associated with daytime sleepiness.
- The patient exhibits agitated behavior, personality changes, or parasomnia.
- The patient with insomnia has coexisting dementia or a suspected mood disorder. In this case, consultation with a geriatric psychiatrist may be appropriate before the patient is referred to a sleep specialist.

Issues that may impede referral or affect its usefulness include the following:

- The patient may be unable to cooperate with a specialist evaluation.
- Transporting the patient to the sleep laboratory may present logistical difficulties.
- Specialist sleep centers are generally not equipped to meet the needs of frail elderly patients.
- Specialist evaluation is likely to be of limited clinical utility in patients with advanced dementia.

If a sleep study is indicated and the patient and family consent to it, polysomnography and overnight oxygen saturation are appropriate tests. The Multiple Sleep Latency Test and wrist actigraphy also may be useful. However, such tests are not recommended for the routine evaluation of insomnia.[31]

TABLE 12

Medications and Other Substances Commonly Associated With Sleep Disturbance*

Insomnia and Excessive Nighttime Wakefulness

- Alcohol, caffeine, nicotine
- Amphetamines
- Anticholinergics and medications with anticholinergic side effects
- Anticonvulsants (e.g., carbamazepine, phenobarbital, phenytoin)**
- Antihypertensives (e.g., clonidine, methyldopa, reserpine)
- Antineoplastic agents (e.g., daunorubicin, goserelin, interferon alfa, leuprolide, pentostatin)
- Beta-adrenergic antagonists (e.g., propanolol, atenolol, pindolol)**
- Bronchodilators (e.g., terbutaline, albuterol, salmeterol, metaproterenol, theophylline)
- Central nervous system stimulants (e.g., methylphenidate)
- Corticosteroids
- Decongestants (e.g., pseudoephedrine)
- Diuretics
- Histamine2 blockers (e.g., famotidine, ranitidine)**
- Hormones (e.g., cortisone, thyroid hormone)
- Levodopa
- Memantine
- Monoamine oxidase inhibitors
- Over-the-counter analgesics and cough and cold remedies containing caffeine
- Quinidine
- Selective serotonin reuptake inhibitors (e.g., sertraline, citalopram)**
- Triazolam (rebound effect)

Sedation and Excessive Daytime Sleepiness

- Antihistamines (e.g., diphenhydramine, hydroxyzine, cyproheptadine)
- Analgesics
- Anticonvulsants (e.g., carbamazepine, phenobarbital, phenytoin)**
- Antidepressants (e.g., doxepin, trazodone, mirtazapine)
- Antihypertensives (especially clonidine, reserpine)
- Antiparkinsonian agents (e.g., carbidopa/levodopa, bromocriptine)
- Antipsychotics (e.g., risperidone, olanzapine)
- Benzodiazepines (e.g., lorazepam, alprazolam)
- Beta-adrenergic antagonists (e.g., propranolol, atenolol, pindolol)**
- Histamine2 blockers (e.g., famotidine, ranitidine)**
- Methyldopa
- Muscle relaxants (e.g., carisoprodol, cyclobenzaprine)
- Nonsteroidal anti-inflammatory agents (e.g., ibuprofen, salsalate)
- Selective serotonin reuptake inhibitor antidepressants (e.g., paroxetine, sertraline)**
- Tricyclic antidepressants (e.g., amitriptyline, nortriptyline)

Nightmares

- Antiparkinsonian agents
- Beta-adrenergic antagonists
- Cholinesterase inhibitors
- Quinidine
- Tricyclic antidepressants
- Depression
- Long-acting benzodiazepines (See PALTmed's 2003 clinical practice guideline on depression.[b])

Other Symptoms

- Diuretics (nocturia)

* Other medications not listed in this table may interfere with sleep in some patients under some circumstances.
** These agents can be associated with both sedation and paradoxical excitation that results in wakefulness.

[b] Post-Acute and Long-Term Care Medical Association. Depression. Clinical Practice Guideline. 2003 (revised). Columbia, MD.

Sources: Cefalu,[15] Kupfer and Reynolds,[30] Susman[9]

TABLE 13

Differential Diagnosis of Sleep Disorders

The following may cause insomnia, hypersomnia, and parasomnia:

Insomnia

- Alcohol
- Chronobiological disorders
- Environmental factors (e.g., light, noise, nursing procedures, temperature extremes)
- Inactivity
- Medical problems (e.g., dyspnea, delirium, nocturia, pain)
- Medications (e.g., antidepressants, levodopa, steroids, cholinesterase inhibitors)
- Mood and anxiety disorders
- Other psychiatric disorders (e.g., bipolar disorder, post-traumatic stress disorder)
- Pain and discomfort (e.g., gastroesophageal reflux disease, incontinence, musculoskeletal disorders)
- Primary insomnia
- Restless legs, periodic limb movements
- Transient insomnia (e.g., from illness or stress)

Hypersomnia and Daytime Sleepiness

- Chronobiological disorders
- Depression
- Medications (see Table 12)
- Nighttime insomnia
- Obstructive sleep apnea

Parasomnia

- REM behavioral disorder

STEP 9

Summarize the results of the assessment of the patient's sleep disorder. The written summaries by the staff and practitioner should:

- Describe the characteristics of the patient's sleep problem.
- Identify environmental, behavioral, and psychosocial factors that may be contributing to the sleep problem.
- Identify coexisting medical conditions and medications that may be contributing to the patient's sleep difficulties.
- List possible treatments for the sleep problem and for coexisting medical conditions that may be contributing to it.
- Give reasons for recommending the use or nonuse of specific treatment options, considering the patient's state of health, advance directives, and preferences.

TABLE 14

Symptoms That May Indicate the Presence of a Sleep Disorder for Which Specialist Evaluation May Be Appropriate

Obstructive Sleep Apnea

Nighttime symptoms

- Erratic breathing patterns
- Gasping
- Loud snoring

Daytime symptoms

- Frequent accidents
- Excessive sleepiness
- Morning headaches

Restless Legs Syndrome

- Discomfort in the limbs, usually the legs, that interferes with falling asleep or staying asleep, is refractory to initial medical management, and is relieved by movement

Periodic Limb Movement Disorder

- Involuntary leg and arm movements during sleep that result in light or fragmented sleep

Sources: Cefalu,[15] Haponik and McCall[12]

In patients in whom a primary sleep disorder (e.g., obstructive sleep apnea, restless legs syndrome) is suspected, the use of at least one objective measure (e.g., rating scale, sleep log) to document the extent and severity of the patient's sleep problem is strongly recommended.

Discuss the causes or suspected causes of the patient's sleep problems with the patient and his or her family and propose treatment options. This discussion should include the risks and benefits of nonpharmacologic and pharmacologic interventions.[15]

TREATMENT

Integrate treatment of a sleep complaint into the patient's interdisciplinary, individualized care plan. Although it is important to treat conditions such as sleep apnea and depression when those conditions are contributing to the sleep problem, it is equally important to address environmental and behavioral factors that may be exacerbating sleep difficulties. Environmental issues such as noise problems should be corrected before more intrusive therapies are introduced to improve sleep.[10]

A key feature of patient care planning that may reduce the incidence of sleep problems is offering patients choices, to the extent possible, about when to go to bed, get up, and have their meals. Most people sleep better if they can observe their habit-

ual sleeping and waking schedule. Staff convenience and staff shortages are not clinically valid reasons for adhering to inflexible, institution-wide bedtimes and rising times that may not accord with patients' individual preferences. To the extent possible, consider patients' sleeping habits when assigning roommates (e.g., try to avoid putting an early riser and a late sleeper in the same room).

STEP 10

Implement nonpharmacologic interventions for the sleep disorder. Studies show that nonpharmacologic approaches take longer to work than pharmacologic agents but are more likely to provide long-term relief of sleep disorders. In the short-term, however, pharmacologic agents may appear to be more effective.[15,30]

In one of only a few randomized controlled trials of treatments for insomnia conducted in older adults with sleep complaints, community-dwelling adults who were an average of 65 years old were treated with behavioral and pharmacologic therapies alone or in combination. Both approaches were equally effective in the short term (3 months). At 12 and 24 months of follow-up, however, behavioral therapy yielded the most durable improvements in sleep patterns. The benefits obtained by patients treated with drug therapy alone were gradually lost, and by 24 months most had returned to their baseline sleep difficulties.[32]

Multiple nonpharmacologic approaches may be tried simultaneously. To the extent possible, tailor interventions to the individual patient's needs and preferences. For example, customize nightwear, pillows, and bedding according to patient preferences. Document in the patient's record the nonpharmacologic interventions that have been implemented and the results obtained.

Individual counseling may be helpful in resolving transient sleep complaints that are related to interpersonal relationships with friends or family. Education about age-related changes in sleep patterns may provide reassurance for patients who are wakeful at night but able to function during the day.

One of the most important nonpharmacologic approaches to the management of insomnia is to try to modify habits that patients may have adopted over the course of many years that interfere with nighttime sleep. Studies have shown that sleep is least disturbed in older men who follow a bedtime routine, whereas older women without a bedtime routine have the most disrupted sleep patterns.[12] The principles of good sleep hygiene (Table 15) have generally been found to be effective, although not all of them will be equally appropriate or effective for every patient.

Studies conducted in long-term care facilities indicate that about one-quarter of awakenings after 10 or more minutes of sleep are associated with noise and light changes; about half of those changes are related to incontinence care practices. Nighttime incontinence care should be individualized; the goals are to minimize sleep disruption, prevent skin problems in immobile patients, and prevent falls in patients with dementia. For example, implement a policy of "checking and changing" patients after 10 p.m. only if they are awake.[33] Avoiding fluid intake (especially of caffeinated beverages) before bedtime and ensuring that patients are toileted before going to bed may help to reduce nighttime awakenings due to nocturia.[34]

TABLE 15

Principles of Good Sleep Hygiene for Residents of Long-Term Care Facilities

- Discourage spending excessive time in bed when not sleeping
- Encourage avoidance of alcohol, caffeine, and nicotine within 4 hours of bedtime
- Encourage daily physical activity (about 6 hours before bedtime)
- Encourage going to bed when sleepy and getting up at a consistent time every day
- Encourage regular exposure to sunlight
- Encourage use of relaxation techniques
- Encourage "winding down" before bedtime (e.g., prayer if culturally appropriate)
- Limit daytime (morning, afternoon, or late-evening) naps
- Limit use of psychoactive drugs
- Minimize noise and light at night
- Maintain appropriate room temperature
- Offer a light snack before bedtime (if not contraindicated), but avoid excessive fluid consumption
- Offer a warm bath 2 hours before bedtime

Adapted from Avidan,[8] Susman[9]

Reduce the use of bright lights during the night. Consider using head lamps and flashlights to provide task lighting for night staff while keeping overhead lights off. Encourage staff to speak quietly and to avoid making unnecessary noise at night.

Elimination of daytime napping is difficult to achieve in the long-term care setting. To the extent feasible, discourage extensive daytime napping by providing a schedule of daytime social and recreational activities and exercise. Daytime napping may be a consequence of boredom or lack of physical activity.[12] One small randomized study found that a combination of increased daytime physical activity and efforts to decrease nighttime noise and sleep-disruptive nursing care practices improved sleep and decreased agitation among residents of a long-term care facility.[35]

Behavioral treatments, such as relaxation therapy, sleep-restriction therapy, and cognitive-behavioral techniques, may be effective for some patients with sleep complaints.[9] Sleep restriction (limiting time spent in bed when not asleep) may be impractical in the long-term care setting, where most patients need assistance to get into and out of bed. No single behavioral intervention is likely to be effective for all patients. If feasible, consider tailoring treatment to individual patient characteristics. Document trials of nonpharmacologic therapies and their outcomes in the patient's medical record.

Complementary therapies, such as meditation, massage therapy, and aromatherapy, may be effective for some patients with sleep complaints, although most such approaches have not been systematically studied.

Alessi et al[36] found that a multidimensional intervention that included increasing daily sunlight exposure and physical activity, decreasing nighttime noise and light,

TABLE 16
Signs, Symptoms, and Treatment Options for Psychiatric Disorders That May Affect Sleep

Disorder	Effects on Sleep	Treatment Options
Anxiety	◆ Sleep-onset and maintenance insomnia ◆ Nightmares	◆ Stress reduction ◆ Short-term antianxiety medication or sedative-hypnotic medication
Depression	◆ Sleep-onset and sleep-maintenance insomnia ◆ Daytime fatigue and sleepiness	◆ Antidepressant medication ◆ Emotional support ◆ Short-term sedative-hypnotic medication
Mania	◆ Episodic sleeplessness ◆ Sleep-cycle fragmentation	◆ Mood stabilizer (e.g., divalproex, atypical antipsychotic)

and implementing a structured bedtime routine reduced daytime sleeping and improved participation in social activities among residents of a long-term care facility.

STEP 11

Reconsider the need for medications that may be interfering with sleep. If the patient is taking any of the medications listed in Table 12, or other medications associated with insomnia, evaluate the continuing need for the drug. If possible, discontinue or reduce doses of drugs that may be interfering with sleep or prescribe alternative agents that are less likely to disrupt sleep.[12]

STEP 12

Treat the medical condition(s) that are the underlying cause(s) of the sleep disorder. Provide optimal treatment for medical condition(s) that are suspected of causing or contributing to sleep difficulties. Refer to the relevant AMDA clinical practice guideline (Appendix 3) for guidance on optimal treatment.

Sleep disturbance can be a symptom of many psychiatric disorders (e.g., anxiety, depression, mania, post-traumatic stress disorder, schizophrenia). If a primary psychiatric disorder is suspected, the practitioner should treat that disorder first (Table 16). Although it has not been established that better sleep improves outcomes in patients with depression, there is little doubt that improving sleep enhances depressed patients' quality of life.[14]

STEP 13

Prescribe medication in combination with nonpharmacologic therapy for the sleep disorder. Drug therapy for a sleep disorder is indicated when nonpharmacologic

TABLE 17
Five Principles of Drug Therapy for Sleep Disorders

- Use the lowest effective dose.
- Use intermittent dosing (2 to 4 times weekly).
- Prescribe medication for short-term use (i.e., regular use for no more than 3 to 4 weeks).*
- Discontinue medication gradually.
- Be alert for rebound insomnia following discontinuation of medication.

* This restriction may not apply to newer sleep agents, which may be appropriate for long-term use.

Adapted from Kupfer and Reynolds[30]

interventions, adjustment of other medications, and treatment of underlying medical conditions are insufficient to alleviate the problem.[31]

Because of the increased risk of adverse drug interactions in frail, elderly patients, medications to promote sleep should generally be used only intermittently when other approaches have failed. Prescribe the lowest possible dose for a short time only, and specify a stop date. Discourage routine "as-needed" use of sleep medications. To minimize daytime sedation, give preference to short-acting agents (i.e., nonbenzodiazepines or short-acting benzodiazepines).[30]

Many patients in the long-term care setting may have developed dependence on or tolerance to various pharmacologic agents. Management of sleep medication use should include periodic attempts at gradual dose reduction, consistent with the five principles of drug therapy for sleep disorders (Table 17), pertinent clinical guidelines, and the most recent OBRA interpretive guidelines (Table 18). Document the outcomes of these attempts appropriately in the patient's medical record. The practitioner's conclusions about the risks and benefits of continued medication use also should be documented in the patient's record.

Benefits of combination therapy. Combining educational, behavioral, and cognitive approaches with drug therapy may reduce the utilization of sleep medications. In a study conducted in an institutionalized setting, patients with insomnia were offered nonpharmacologic therapies such as a 5-minute back rub; a warm, noncaffeinated beverage; or the opportunity to listen to a relaxing audiotape. A sleep medication was given if the patient had not fallen asleep within an hour of administration of the nonpharmacologic therapy. This intervention resulted in a 23 percent reduction in the administration of sedative and hypnotic medications.[37]

Comments on Specific Drugs and Classes of Sleep Medications

Table 19 lists acceptable and unacceptable medications for the treatment of insomnia in the long-term care setting.

Evidence of the effectiveness and potential adverse effects of new sleep agents in the long-term care population is often lacking because trials of those agents are rarely conducted in this population. A review of 23 trials involving a total of 1,082 patients,

TABLE 18

OBRA* for the Use of Pharmacologic Agents to Induce Sleep

- Use drugs to induce sleep only under the following circumstances:
  - Evidence exists that other potential causes of insomnia (e.g., depression, pain, noise, light, caffeine) have been ruled out.
  - The treatment results in maintenance or improvement of the patient's functional status without causing problematic side effects.
- Use drugs daily for no more than 10 consecutive days unless an attempt at gradual dose reduction is unsuccessful.
- Administer drug doses equal to or less than those specified in dosing guidelines unless higher doses are necessary to maintain or improve the patient's functional status.
- Gradual dose reduction should be attempted at least twice within one year for patients on chronic therapy to confirm the need for further treatment.

* Omnibus Budget Reconciliation Act

Adapted from Cefalu[15]

including 516 psychogeriatric inpatients or residents of long-term care facilities, found scientific support for the short-term (up to 3 weeks) efficacy of zolpidem, triazolam, temazepam, flurazepam, and quazepam, but not chloral hydrate, in elderly patients.[30] However, the 2005 National Institutes of Health consensus statement on the manifestations and management of chronic insomnia in adults highlighted the superior benefit/risk profile of the nonbenzodiazepines compared with the older benzodiazepines.[38]

Practitioners need to be aware that certain categories of drugs, including benzodiazepines, are currently (as of early 2006) excluded from standard coverage under the Medicare prescription drug benefit (Medicare Part D). Some providers of Medicare prescription drug benefits, however, may offer coverage of those drugs through enhanced coverage plans. In addition, some states' prescription drug plans may provide coverage for these categories of drugs.

Nonbenzodiazepines

Zolpidem, approved for the short-term treatment of insomnia, has a time to peak concentration of 1.6 to 2.2 hours; its half-life is 1.5 to 3.2 hours. Studies suggest that next-day cognitive functioning and performance are not affected by nighttime use.[31] In studies of acute and chronic insomnia, zolpidem has been shown to be similar in efficacy to benzodiazepines. This agent may be less likely than benzodiazepines to disturb sleep architecture and to cause cognitive and psychomotor side effects.[30]

An extended-release form of zolpidem received marketing approval from the U.S. Food and Drug Administration (FDA) in September 2005. Use of the extended-release formulation results in extended plasma concentrations beyond 3 hours after administration. Zolpidem extended-release is indicated for the treatment of insomnia characterized by difficulties with sleep onset or sleep maintenance and does not have a recommended limitation on duration of use. In a randomized, double-blind, placebo-controlled multicenter trial in the outpatient setting, involving 205 men and women aged 65 or older who had a diagnosis of primary insomnia, nightly treatment with zolpidem extended-release 6.25 mg for 2 weeks effectively induced and maintained sleep. No evidence of next-day residual effects was detected 8 hours following drug administration in elderly patients using self-ratings of sedation, even at twice the recommended dose (12.5 mg).[39]

Zaleplon has a time to peak concentration of 1 hour; its half-life is 0.9 to 1.1 hours. It demonstrates no evidence of residual daytime sedation and therefore can be dosed in the middle of the night as needed for patients with sleep-maintenance insomnia.[31] Neither zolpidem nor zaleplon produces physical dependency or causes withdrawal side effects when stopped abruptly.[15]

As of this writing, the FDA had approved new sleep medications that, unlike other commercially available sleep agents, may be appropriate for long-term use. Eszopiclone (approved in December 2004) has a time to peak concentration of 1 hour and a half-life of 6 hours in adults and 9 hours in the elderly.[40] In a randomized, double-blind, placebo-controlled multicenter trial in the outpatient setting involving 231 men and women ages 65 to 85 who had a diagnosis of primary insomnia, nightly treatment with eszopiclone 1 mg for 2 weeks effectively induced sleep; the 2 mg dose effectively induced and maintained sleep. The drug was well tolerated in community dwellers; the most frequent treatment-related adverse event was an unpleasant taste. Dosage adjustment is necessary for patients with severe liver disease but not for those with renal impairment.[41]

Eszopiclone is indicated for the treatment of insomnia. In controlled laboratory studies, when administered at bedtime, it decreased sleep latency and improved sleep maintenance. Eszopiclone's labeling permits the drug to be prescribed for as long as the patient obtains benefit. However, nightly use of eszopiclone for up to 6 months was studied only in adults under age 65. No data are available on the safety and effectiveness of long-term use of eszopiclone in the frail elderly.

A new sleep agent, ramelteon, was approved in July 2005 and became commercially available in October 2005. Ramelteon belongs to a new class of drugs, selective melatonin type 1 (MT1) and type 2 (MT2) receptor agonists, which mimic the action of the naturally occurring hormone melatonin. It is the first sleep agent not to be designated a controlled substance by the U.S. Drug Enforcement Administration. Ramelteon is indicated for the treatment of insomnia characterized by difficulty with sleep onset.

Results from a randomized, placebo-controlled study of ramelteon involving 829 adults aged 64 to 93 who had chronic insomnia were reported at the American Geriatrics Society's annual scientific meeting in May 2005. In that study, patients who

received ramelteon 4 mg or 8 mg at bedtime for 5 weeks had statistically significant decreases in the time needed to fall asleep, compared with patients who received a placebo. No rebound insomnia or withdrawal symptoms were seen when patients discontinued use of ramelteon. Rates of adverse effects were similar for patients receiving ramelteon and for those who received a placebo.[42] Patients with severe liver disease should not take ramelteon.[43]

As with all medications, relative efficacy and safety for longer-term use does not imply that a medication should be used indefinitely without attempts at dose reduction or as a substitute for efforts to identify and address underlying causes of the patient's sleep problem.

Benzodiazepines

Continuous use of benzodiazepine hypnotic agents should be discouraged in the long-term care setting because of the risk of side effects, physiological tolerance, and adverse effects on discontinuation. Adverse events such as memory impairment, falls, excessive daytime sleepiness, and accidents occur more often at higher doses and with the use of long-acting agents. In addition, prolonged use of long-acting benzodiazepines can lead to cognitive impairment, incoordination, and worsening of depression.[30] These agents are associated with anterograde amnesia, rebound insomnia, and residual daytime sedation, especially at high doses.[44] These adverse effects generally appear to be worse in the elderly. The newer benzodiazepine receptor agonists have much less frequent and severe adverse effects, most likely because they have shorter half-lives.[38]

The available literature suggests that, in the short term, abuse of the benzodiazepine receptor agonists is not a major problem, but problems associated with their long-term use require further study in the general population of persons with insomnia.[38] The likelihood of misuse is low when benzodiazepines are used in small doses. When they are taken for extended periods of time, however, withdrawal symptoms and tolerance to the drugs' hypnotic effects are common.[31]

Antihistamines

The active ingredient in many over-the-counter sleep medications is a sedating antihistamine, most commonly diphenhydramine or hydroxyzine. Medications containing diphenhydramine or hydroxyzine vary in efficacy and have anticholinergic properties that may result in a variety of adverse effects.

Antidepressants

Few data from controlled clinical trials support the effectiveness of antidepressants for chronic insomnia in the absence of a mood disorder. A single study found that trimipramine produced subjective improvements in the quality and quantity of sleep along with objective improvements, as measured by polysomnography.[30]

Side effects of tricyclic antidepressants include anticholinergic effects and various degrees of suppression of REM sleep.[31] Serotonin-specific antidepressants alleviate the sleep disturbance that accompanies depression and have fewer serious side

effects than tertiary amine antidepressants.

Trazodone has both sedative and antidepressant effects. It tends to work best for patients who have both insomnia and depression; a starting dose of 25 to 50 mg should be given at bedtime.[15] In one study of patients with primary insomnia who were not depressed, trazodone and zolpidem had similar effects on sleep latency and total sleep time.[45] Potential side effects of this agent include induction of cardiac arrhythmias (in patients with heart disease) and orthostatic hypotension.

Mirtazapine is an appropriate medication for the management of depressive symptoms that include insomnia.[46] Nefazodone is no longer considered an appropriate agent for the first-line treatment of insomnia with depression in long-term care patients. (See PALTmed's 2005 pharmacotherapy companion to the clinical practice guideline on depression.[c]) All antidepressants have potentially significant adverse effects, raising concerns about the risk–benefit ratio.[38]

Alternative Remedies

Melatonin is the only alternative remedy to have been extensively studied in a geriatric population. It appears to be safe and to have a modest effect in older patients, including those with dementia. In a double-blind, placebo-controlled study, melatonin 2 mg/d was superior to placebo in improving sleep efficiency in elderly patients with chronic insomnia unrelated to circadian disturbances.[30] In a multicenter trial in patients with Alzheimer's disease, melatonin had a modest effect on sleep disturbance.[47] However, no information is available about the safety of long-term use of melatonin.[38]

Side Effects of Sleep Medications

Frail, elderly patients are more vulnerable than younger, healthier people to the potential side effects of sedatives and hypnotics (Table 20). For example, patients with renal and hepatic insufficiency may be at greater risk for side effects from sedatives.[30] Withdrawal from hypnotics, especially abrupt cessation of long-acting medications, can produce a worsening of insomnia and heightened anxiety. The patient and family should be advised that some insomnia may be expected on the withdrawal or tapering of any hypnotic agent.

In patients with underlying obstructive sleep apnea, hypnotics can produce further nocturnal hypoxemia.[8] Benzodiazepines may increase nocturnal confusion secondary to sedation and may produce behavioral disturbance due to disinhibition.[48] The anticholinergic and sedating side effects of tricyclic antidepressants and antihistamines can increase cognitive deficits. Antipsychotic medications can cause orthostatic hypotension, possibly increasing the risk of falls.[8]

MONITORING

STEP 14

Monitor the effectiveness of interventions to treat the sleep disorder. Reassess the patient at regular intervals to determine whether interventions to treat the sleep dis-

[c] Post-Acute and Long-Term Care Medical Association. Dementia. Clinical Practice Guideline. 2005 (revised). Columbia, MD.

TABLE 19

Acceptable and Unacceptable Medications for the Treatment of Insomnia in the Long-Term Care Setting

NOTES:

1. Agents considered acceptable are listed alphabetically, not in order of preference.
2. This table does not address duration of action, which is likely to vary in frail, elderly patients because of the prevalence of kidney and liver function abnormalities in this population.

	Agent	Class	Onset of Action (minutes)	Approved Indication (Sleep Latency, Sleep Maintenance, or Both)	Recommended Oral Dose in the Elderly (mg/d)
Acceptable	Estazolam (ProSom®)	Benzodiazepine, intermediate acting	15–30	Both	0.5–1
	Eszopiclone (Lunesta®)	Nonbenzodiazepine, short acting	45–60	Both	1–2
	Lorazepam (Ativan®)	Benzodiazepine, short acting	30–60	None	1–2
	Ramelteon (Rozerem®)	Melatonin receptor agonist	30-90	Sleep Latency	4-8
	Temazepam (Restoril®)	Benzodiazepine, intermediate acting	45–60	Both	7.5–15
	Trazodone (Desyrel®)	Serotonergic agent	60–120	*Not FDA approved for sleep	25–50
	Zaleplon (Sonata®)	Nonbenzodiazepine, short acting	30	Sleep latency	5
	Zolpidem (Ambien®)	Nonbenzodiazepine, short acting	15–30	Sleep latency	5
	Zolpidem extended release (Ambien CR®)	Nonbenzodiazepine, short acting	15–30	Both	6.25
Over-the-counter alternative	Melatonin		60–120	N/A	2
Unacceptable	Amobarbital Aprobarbital Butabarbital	Barbiturates, intermediate acting	N/A		
	Chloral hydrate	Direct central nervous system depressant			
	Diphenhydramine	Antihistamine, intermediate acting			
	Flurazepam	Benzodiazepine, long acting			
	Mephobarbital	Barbiturate, long acting			
	Pentobarbital	Barbiturate, short acting			
	Quazepam	Benzodiazepine, long acting			
	Secobarbital	Barbiturate, short acting			

*The clinical use is for depressed individuals who are having sleep difficulty

TABLE 20

Possible Side Effects of Sleep Medications in Long-Term Care Patients

- Agitation
- Ataxia
- Daytime sleepiness
- Disorientation
- Dizziness
- Headache
- Impaired judgment
- Impaired motor skills
- Increased risk for falls
- Mood distortion
- Nightmares
- Rebound insomnia
- Residual sedation

TABLE 21

Sample Performance Measurement Indicators

Outcome Indicators

- Declines in
  - Complaints related to patients' inability to sleep at night
  - Prevalence of daytime sleepiness
  - Use of sleep medications inappropriate in frail, elderly patients
  - Use of all hypnotic and sedative medications
- Improvements in
  - Function
  - Participation in activities of daily living
- Increases in rates of patient participation in social and recreational activities and exercise programs

Process Indicators

- Sleep history and habits during the patient's entire adult life, not just during the past year, included in preadmission assessment
- Information obtained during preadmission assessment addressed upon admission and followed up at initial care conference
- Documentation of sleep complaints and interventions in patient's individualized care plan
- Implementation of environmental interventions to improve sleep quality

order are effective. If a sleep log was completed to document the patient's sleep pattern (see Step 4), consider completing a follow-up sleep log in 4 to 8 weeks to quantify the changes, if any, that have occurred as a result of the interventions. Document the reassessment findings in the patient's record.

STEP 15

Maintain or modify interventions according to the patient's response to treatment. On the basis of the findings in Step 14, determine whether adjustment of the plan for managing the patient's sleep disorder is indicated.

Interventions that have helped to alleviate the patient's sleep difficulties may be continued. Consider, however, whether they can be stopped, at least for a trial period, because the cause may have resolved or because they are not appropriate for long-term use. Interventions that are ineffective should be discontinued after a reasonable trial period (the length of which will vary depending on the nature of the intervention). Nonpharmacologic interventions may require time to demonstrate effectiveness but are likely to have a more lasting effect because they involve behavior modification. Medications may be effective in the short term but usually become less effective over time. Dependence and tolerance may develop over time.

Discuss proposed changes in the patient's treatment plan with the patient, family or advocate, and caregiving staff. Repeat Steps 14 and 15 as appropriate to ensure that the patient continues to receive effective management of the sleep disorder.

STEP 16

Monitor the facility's management of sleep disorders. Review the management of patients with sleep disorders through the facility's quality improvement processes. Table 21 suggests indicators that a facility may wish to use (selecting those most relevant to its population) to measure the success of interventions to manage sleep complaints.

SUMMARY

Age-related sleep changes, medical conditions common among older people, medications that interfere with sleep, substance use, and factors related to the environment within the long-term care facility all contribute to the prevalence of sleep difficulties in the long-term care population. This guideline proposes a stepwise approach that facilitates appropriate management of long-term care patients with sleep disorders, using a combination of nonpharmacologic and pharmacologic therapies. In general, environmental, behavioral, and psychosocial approaches are more likely than pharmacologic agents to provide long-term relief of sleep disorders in this population. Sedative and hypnotic medications should be used with great caution, in the lowest possible doses, and only for the shortest possible periods of time in long-term care patients.

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APPENDIX 1.

Pittsburgh Sleep Quality Index (PQSI)

Instructions: The following questions relate to your usual sleep habits during the past month. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

During the past month:

1. When have you usually gone to bed? _____
2. How long (in minutes) has it taken to fall asleep each night? _____
3. When have you usually gotten up in the morning? _____
4. How many hours of actual sleep did you get that night? (This may be different than the number of hours you spend in bed) _____

5. During the past month, how often have you had trouble sleeping because you...	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
a. Cannot get to sleep within 30 minutes				
b. Wake up in the middle of the night or early morning				
c. Have to get up to use the bathroom				
d. Cannot breathe comfortably				
e. Cough or snore loudly				
f. Feel too cold				
g. Feel too hot				
h. Have bad dreams				
i. Have pain				
j. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s):				
6. During the past month, how often have you taken sleep medicine (prescribed or "over the counter") to help you sleep?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up your enthusiasm to get things done?				
	Very good (0)	Fairly good (1)	Fairly bad (2)	Very bad (3)
9. During the past month, how would you rate your sleep quality overall?				

Component 1 #9 Score C1 _____

Component 2 #2 Score (<= 15 min (0), 16-30 min (1), 31-60 min (2), >60 min (3)) + #5a Score (if sum is equal 0=0; 1-2=1; 3-4=2; 5-6=3) C2 _____

Component 3 #4 Score (>7 (0), 6-7 (1), 5-6 (2), <5 (3)) C3 _____

Component 4 (total # of hours asleep)/(total # of hours in bed) x 100 >85%=0, 75%-84%=1, 65%-74%=2, <65%=3 C4 _____

Component 5 #sum of scores 5b to 5j (0=0; 1-9=1; 10-18=2; 19-27=3) C5 _____

Component 6 #6 Score C6 _____

Component 7 #7 score +#8 score (0=0; 1-2=1; 3-4=2; 5-6=3) C7 _____

Add the seven component scores together _____ **Global PSQI Score** _____

APPENDIX 2.

Sleep Disorders Inventory

Directions: Ask the subject's principal caregiver to indicate whether any of the subject behaviors listed below occurred during the previous 2 weeks. If so, use the following scales to rate the frequency, severity and amount of distress each causes the caregiver.

Symptom

1. Difficulty falling asleep
2. Getting up during the night (do not count if the subject gets up once or twice per night to go to the bathroom and quickly falls back to sleep)
3. Wandering, pacing or getting involved in inappropriate activities at night
4. Awakening you during the night
5. Awakening at night, dressing and planning to go out, thinking that it is morning and time to start the day
6. Awakening too early in the morning (earlier than is his/her habit)
7. Sleeping excessively during the day
8. Other night-time behaviors that bother you

Frequency

0: Not present in the last 2 weeks
1: Less than once per week
2: One to two times per week
3: Several times per week but less than every day
4: Once or more per day (every night)

Severity

0: Not present
1: Mild: night-time behaviors occur but are not particularly disruptive
2: Moderate: night-time behaviors occur and disturb the patient and the sleep of the caregiver; more than one type of night-time behavior may be present
3: Marked: night-time behaviors occur; several types of night-time behavior may be present; the patient is very distressed during the night and caregiver's sleep is markedly disturbed

Caregiver Distress: How emotionally distressing do you find this behavior?

0: Not at all
1: Minimally
2: Mildly
3: Moderately
4: Severely
5: Very Severely/extremely

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APPENDIX 3.

AMDA Clinical Practice Guidelines for Conditions That May Be Underlying Causes of Sleep Disorders

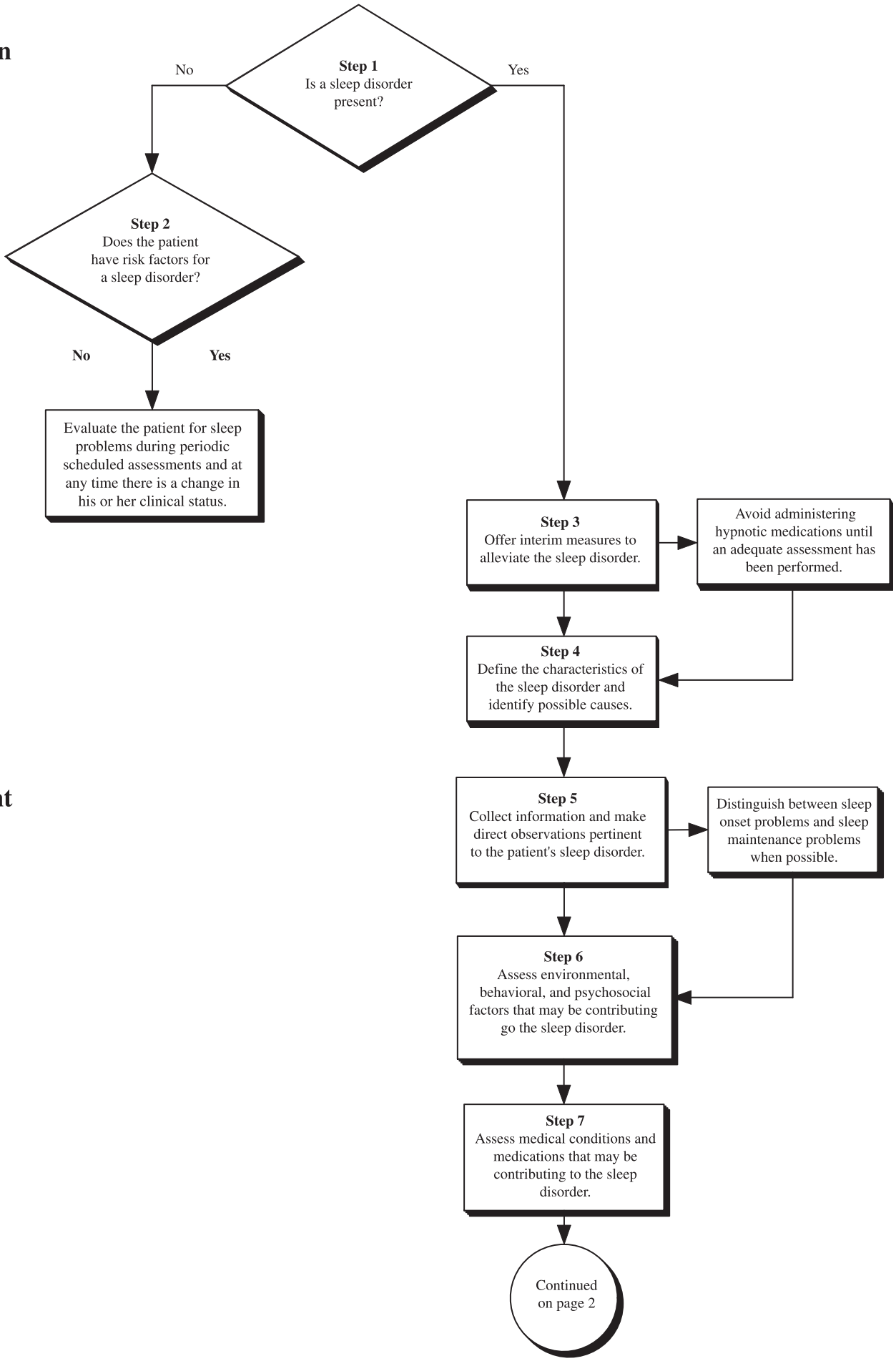
Acute Change of Condition in the Long-Term Care Setting (2003)
Delirium and Acute Problematic Behavior (1998, revised 2008)
Chronic Obstructive Pulmonary Disease (2003, revised 2010)
Dementia (1998, revised 2005, 2009)
Depression (1996, revised 2003, 2011)
Heart Failure (1996, revised 2002, 2010)
Pain Management in the Long-Term Care Setting (1999, revised 2003, 2012)
Parkinson's Disease (2002, revised 2010)
Urinary Incontinence (1996, revised 2005, 2007, 2012)

NOTES

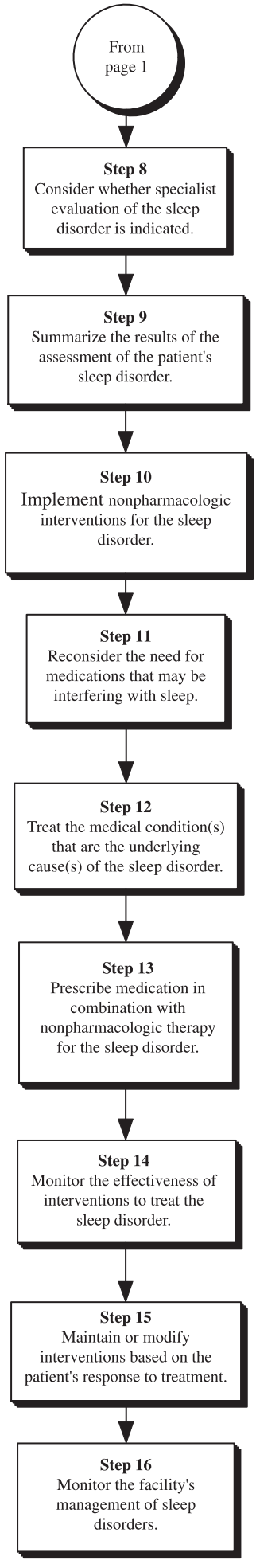
NOTES

This is the sleep disorders in the long-term care setting algorithm to be used in conjunction with the written text of this clinical practice guideline. The numbers next to the different components of the algorithm correspond with the steps in the text.

Recognition



Assessment



Treatment

Monitoring

The Post-Acute and Long-Term Care Medical Association developed this guideline with the support and cooperation of the following individuals and companies:

Naushira Pandya, MD, CMD, Project Chair
Steven Levenson, MD, CMD, Clinical Practice Committee Chair

Steering Committee Members:

Marjorie Berleth, MSHA RNC FADONA
Lisa Cantrell, RN, C
Charles Cefalu, MD, MS
Sandra Fitzler, RN
Joseph Gruber, RPh, FASCP, CGP
Susan M. Levy, MD, CMD
Harlan Martin, R.Ph., CCP, FASCP
Evvie F. Munley
Jonathan Musher, MD, CMD
Mary Tellis-Nayak RN, MSN
Barbara Resnick, PhD, CRNP
William Simonson, Pharm.D., FASCP

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