

Sleep in the Elderly: A Practical Approach

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The elderly commonly complain about the quality and quantity of their sleep. The family physician can assess accurately such symptoms in the office. It is important for the physician to recognize age-related changes in sleep and obtain an accurate history. The correction of environmental disruptions and transient psychophysiological problems, the critical evaluation of drug use, and the treatment of underlying medical conditions are important first steps in addressing the complaint of insomnia. Appropriate sleep hygiene and pharmacologic therapy can be helpful in many instances. The family physician, however, must remember that primary sleep disorders are more common in the elderly, and sleep-center referral should be considered if such a disturbance is suspected or if problems persist after conservative therapy.

Sleep and watchfulness, both of these when immoderate constitute disease.

—Hippocrates

Though physiologists still debate the purpose of sleep, its importance in health and disease has been noted since the time of Hippocrates. The debilitating effects of sleep deprivation, including fatigue, memory deficits, personality changes, and difficulty in concentration, are striking.¹ Perhaps it is of little wonder 30% to 45% of the elderly complain of insomnia and up to 14% use sleeping pills habitually.² To understand the role of the family physician in treating sleep disorders in the elderly, a brief background of sleep physiology is important.

Physiologists divide sleep into stages based upon characteristic electroencephalographic changes. Sleep may be divided into non-rapid-eye-movement (non-REM) and rapid-eye-movement (REM) sleep.¹

Non-REM consists of four stages that can be simplified into light and deep sleep. During non-REM sleep, motor tone is preserved, eye movements are rare, and physiologic factors are stable.

During REM sleep, atonia of the major antigravity muscles occurs, rapid conjugate eye movements are typical, and physiologic variables fluctuate widely. Increased oxy-

gen requirements and increased autonomic activity occur during this sleep stage. Dreaming and penile tumescence are also characteristic of REM Sleep. These distinctions between REM and non-REM sleep are important in understanding specific sleep disorders.

Certain characteristic changes occur in sleep architecture with aging.²⁻⁵ There is an increased sleep latency (time from lights out until sleeping). Light sleep is increased, whereas deeper sleep is decreased. The percentage of time spent in REM is almost the same in older patients as in younger patients, but there is decreased total REM sleep. Generally the number of nocturnal awakenings increases, especially very brief ones, but the elderly tend to get back to sleep more quickly than younger adults. Sleep is generally less efficient; in other words, there is more time spent in bed with less time spent sleeping. Total sleep time is usually less, but there is wide intra-individual variability. Thus, sleep is generally a less efficient and lighter process in the aged.

EVALUATION OF SLEEP DISORDERS

It is important to recognize that insomnia is a symptom, not a diagnosis or a disease. To assess accurately the cause of insomnia, a thorough history is of primary importance. A sleep history should include an interview with both the patient and his or her bed partner, if pertinent. A sleep diary and a tape recording (if snoring or unusual noises are a problem) can be valuable. Information concerning habits, including alcohol and caffeine use, activities prior to

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bedtime, and the quality of sleep are all important. The patient should also record the occurrence of snoring, unusual movements, dreams, daytime sleepiness, and naps, as well as how rested he or she feels upon awakening.

In evaluating patients with insomnia, it is important to remember that nocturnal awakenings and difficulty in falling asleep are common in older patients. Furthermore, while the average length of sleep is about 7 to 7½ hours, this length varies from individual to individual and in the same person over time. The patient should be advised to correct environmental problems such as excessive noise or extreme temperatures. The physician must also explore transient psychophysiologic factors, including stress, anxiety, or depression. Indeed, depression may be one of the most commonly overlooked causes of geriatric sleep disturbance, especially in the family practice setting. Loss and change in status such as retirement can also influence sleep. Such life stresses, combined with decreased hearing, vision, and functional ability, can lead to decreased interaction with the outside world, boredom, and disordered sleep patterns. Moreover, a thorough drug, alcohol, and caffeine history is extremely valuable because such factors play a role in 10% to 20% of sleep disorders.² Caffeine, sympathomimetics, bronchodilators, alcohol, and a variety of other prescription medications can provoke wakefulness, whereas anticholinergics, tricyclic antidepressants, and antihistamines may cause excessive somnolence. Diuretics are obvious causes of nocturia and sleep difficulties. Finally, tricyclic antidepressants, antiparkinsonism agents, and antihypertensive medications (most classically, propranolol) can induce nightmares.³

Next, the physician should rule out treatable medical disorders, including causes of pain, paresthesia, cough, breathlessness, or other troublesome symptoms. Arthritic conditions, gastrointestinal reflux, diabetic neuropathy, prostatism, and congestive heart failure can all present as insomnia and are best treated by correcting the underlying disease, not by prescribing hypnotics or referring the patient for a sleep laboratory evaluation.

WHEN TO SUSPECT PRIMARY SLEEP DISORDERS

Serious sleep disorders are of increasing prevalence in the aged, and the family physician needs a working knowledge for their diagnosis. The Association of Sleep Disorder Clinics has divided primary sleep disorders into the following categories:

1. Disorders of the sleep-wake cycle
2. Disorders of excessive somnolence (DOES)
3. Disorders of initiating and maintaining sleep (DIMS)
4. Other disorders including parasomnias

While this classification scheme may be helpful to the specialist, the important point is to remember the existence of primary sleep disorders. When a sleep problem persists despite the recognition of physiologic changes and the treatment of medical, iatrogenic, and psychologic problems, evaluation for primary sleep disorders should be considered.

Sleep-Wake Cycle Disturbances

Problems with the sleep-wake cycle can range from the transient difficulties seen with jet lag or shift work to intractable problems requiring sleep laboratory evaluation.^{2,6} Short and long sleepers, those who sleep fewer than 5 or more than 9 hours, respectively, comprise up to 5% of the normal population. Such patients have normal electroencephalograms (EEGs) and require no treatment. Jet lag and work-shift problems are common as the elderly travel more extensively and work later in life. Good sleep hygiene and anticipatory guidance are appropriate. Recent reports of amnesia and depersonalization with triazolam in the treatment of jet lag illustrate potential complications with even short-term, rapidly eliminated benzodiazepine therapy.⁷

Patients with sleep-phase disturbances, where the circadian rhythms and appropriate sleeping period have become asynchronous, are difficult to treat and require referral. In the delayed sleep-phase problem, patients fall asleep later, have no problems once asleep, and waken later. Treatment is aimed at progressively shifting bedtime by small intervals until the normal sleep phase is obtained. Patients with advanced sleep-phase disturbances, on the other hand, fall asleep earlier in the evening and awaken earlier in the morning. Patients with irregular sleep-awake cycles have very disjointed sleep habits interrupted by periodic somnolence and naps. Such patients require strict sleep hygiene. Suspicion of a sleep-phase disturbance warrants referral to a sleep center.

DOES—Sleep Apnea Syndrome

Sleep apnea syndrome is a common, potentially life-threatening disorder in the elderly.^{2,8-13} Patients will present with daytime sleepiness, snoring that is especially loud or unusual, morning headaches, personality changes, or physical signs including obesity, hypertension, cor pulmonale, arrhythmias, and upper airway abnormalities. Apnea may occur as a result of central causes, in which there is simultaneous cessation of breathing effort and nasal and oral airflow, or for obstructive reasons, in which thoracic respirations persist in the absence of normal airflow. Mixed disturbances occur when central apnea precedes obstructive episodes.

The physician has no difficulty making the diagnosis of sleep apnea syndrome in the face of the full-blown pick-

wickian syndrome. Yet, over 60% of men over 60 years of age snore.¹⁴ If physicians use criteria that apply to younger patients, as many as one third of those over 65 years of age may appear to have sleep apnea syndrome.^{2,4,13} In the Stanford series of patients referred to a sleep center for daytime sleepiness, approximately 70% had sleep apnea syndrome.¹⁵ The distinction, therefore, between age-related changes as compared with pathologic problems is unclear. Some useful keys for referral include the following.

First, daytime sleepiness or unusual or pronounced snoring, especially when associated with physical symptoms or significant functional impairment, warrant referral. Sedative-hypnotics can exacerbate sleep apnea syndrome, so it is essential to make this diagnosis. Furthermore, referral is recommended if symptoms are persistent or recalcitrant to conservative therapy.

DOES—Narcolepsy

Narcolepsy is a characteristic disorder of excessive somnolence associated with REM “sleep attacks.” Occurrence of excessive daytime somnolence first begins early in adulthood and often precedes other symptoms. “Sleep attacks,” where REM sleep occurs with little or no warning, is another salient feature. Accidents and amnesia predictably occur. Cataplexy or sudden muscle weakness is pathognomonic but may occur infrequently and be transient. Hypnagogic or bizarre nightmares are common. In elderly patients with excessive daytime somnolence, narcolepsy must be a strong consideration, especially when symptoms are unresponsive to appropriate sleep hygiene.

Parasomnias

Parasomnias or motor disturbances can be elusive but very disruptive disorders of sleep in the elderly.¹⁶ Many patients experience hypnic jerks, or nonrepetitive muscle contractions, that occur at sleep onset and are worse with caffeine use. Nocturnal myoclonus, on the other hand, consists of debilitating, repetitive, and stereotypical leg movements occurring in non-REM sleep. These movements can last hours and interfere with falling and staying asleep. While reports from bed partners may be informative, a sleep laboratory evaluation usually secures this diagnosis.

The restless leg syndrome is another motor disturbance that results in an uncontrollable urge to move one’s legs.² One third of these patients have a positive family history of restless leg syndrome. In some cases, an underlying disorder of renal, neurologic, or circulatory origin is present.

Sleep in Special Circumstances

Sleep disturbance is commonly associated with disrupted routines or changing environmental factors. Many patients

TABLE 1. GOOD SLEEP HYGIENE FOR THE ELDERLY

Maintain regular rising time
Exercise daily (not close to bedtime)
Control environment: maintain proper temperature, decrease noise and light
Have light snack at bedtime (if not contraindicated)
Limit or eliminate alcohol, caffeine, and nicotine
Use hypnotics on short-term basis only
Wind down prior to bedtime
Confine worry time to early evening
Go to bed when sleepy
Avoid extremes of sleep, eg, excessive sleep on weekends
Use relaxation and behavioral modification techniques
Use bed for sleeping only
Eliminate naps unless part of schedule
Get up if unable to fall asleep in 15 to 30 minutes
Sleep where sleep best
Recognize adaptation effect in new environments

will find disruption in their bedtime, increased naps, and changes in alcohol and caffeine use when they retire from their working career. Anticipatory counseling will often make such transitions smooth.

Hospitalization is another challenge to the elderly’s sound sleep.¹⁷ Individual medical illnesses, coupled with attendant psychophysiological factors, precipitate sleep problems. Pain, fear, guilt, and depression, coupled with a busy hospital environment, make normal sleep difficult.

Institutionalization is another frequent cause of sleep disorder. Almost 95% of institutionalized patients in skilled facilities in one study used sedative hypnotics.¹⁸ The unyielding routine of medication and procedures accommodates individual sleep patterns poorly.

Sleep Disturbance and Dementia

Dementia is a common problem in the elderly, especially in institutionalized populations. Sleep disturbance is one of the more disruptive symptoms.¹⁹ Most physicians are familiar with “sundowning,” the nocturnal confusion, wandering, and hallucinations that typically occur late in the day in demented patients. These problems are associated

with decreased deep and REM sleep. There is fragmentation of sleep with increased awakenings and daytime napping. Such behavior is difficult to address but may respond to strict routines and major tranquilizers.

TREATMENT OF SLEEP DISORDERS

If the initial history and physical examination fail to disclose a serious underlying cause for insomnia or the suggestion of a primary sleep disorder, a trial of conservative therapy is reasonable. Central to this therapy is establishing good sleep hygiene (Table 1), which promotes regular sleep habits. Such measures are generally safe and cost effective.

What about naps? Many experts now suggest that naps can be a useful part of a patient's routine.³ The physician and patient must recognize that these naps will decrease the need for sleep at night. Naps often correspond to the physiologic tendency to sleep at midday, but boredom, inactivity, and medication side effects can also predispose to daytime somnolence. Thus, naps can be useful if other problems are first ruled out and effective patient education is accomplished.

Snorers may benefit from lighter sleep and the avoidance of alcohol, antihistamines, and benzodiazepines, which exacerbate their problems.¹³ Caffeine or over-the-counter phenylpropanolamine preparations may be helpful. Use of a soft collar, raising the head of the bed, or sleeping sideways may also be effective in selected patients. When snoring is persistent or associated with abnormal movements or cardiopulmonary signs, referral is mandatory to rule out sleep apnea syndrome or treatable upper airway or pulmonary disorders.

Pharmacologic Treatment

The elderly use 20 million over-the-counter and 26 million prescription sleep remedies each year.² Up to one half of the community-living elderly use such medications and, as mentioned above, up to 95% of institutionalized patients are taking sedative hypnotics.² Unfortunately, few investigators have explored the long-term effects of pharmacologic therapy on sleep. Alcohol is probably the most used nonprescription sleep medication. While initial use may decrease sleep latency, REM time is also decreased and REM rebound will inevitably occur. Total sleep time remains the same. The addictive potential and vicious cycle set up by sleeplessness, alcohol-induced sleep changes, and further alcohol consumption argue strongly against alcohol's use in sleep disorders.²⁰ Over-the-counter sleep remedies are typically antihistamines, which are effective on a short-term basis but run the risk of carryover effects, toler-

effects, tolerance, paradoxical wakefulness, and anticholinergic side effects including confusion and urinary retention. These agents are also less than ideal for treatment of any but the shortest term sleep disturbance.³

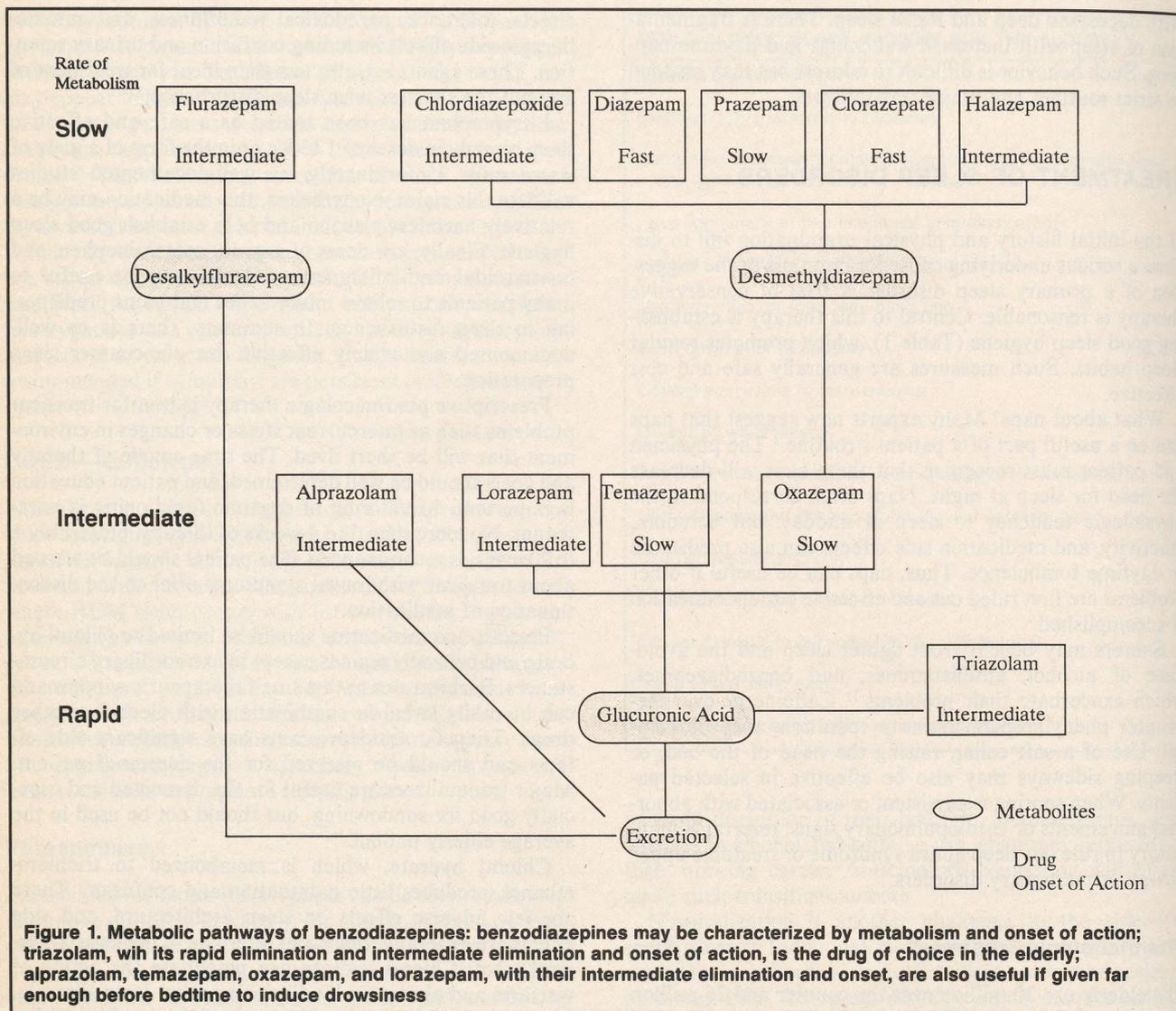
L-tryptophan has been touted as a safe and effective sleep remedy in doses of 1 to 5 g or in the form of a glass of warm milk. Unfortunately, no well-documented studies validate this claim. Nonetheless, this medication may be a relatively harmless placebo and help establish good sleep hygiene. Finally, low doses of aspirin, acetaminophen, and nonsteroidal anti-inflammatory drugs may be useful to many patients to relieve minor aches and pains predisposing to sleep disturbance. In summary, there is no well-documented and widely effective over-the-counter sleep preparation.

Prescriptive pharmacologic therapy is best for transient problems such as intercurrent stress or changes in environment that will be short lived. The time course of therapy and goals should be well determined, and patient education is important. Monitoring of daytime functioning is paramount. No more than 3 to 4 weeks of therapy, preferably 1 to 2 weeks, is recommended. The patient should be warned about transient withdrawal symptoms prior to the discontinuation of medication.

Prescription medication should be limited to chloral hydrate and benzodiazepines except in extraordinary circumstances. Barbiturates have a small therapeutic window and can be easily lethal in combination with alcohol or other drugs. Tricyclic antidepressants have significant side effects and should be reserved for the depressed patient. Major tranquilizers are useful for the demented and especially good for sundowning, but should not be used in the average elderly patient.

Chloral hydrate, which is metabolized to trichloroethanol, produces little habituation and confusion. There are few adverse effects on sleep architecture, and side effects are generally minor and referable to the gastrointestinal tract. Chloral hydrate can potentiate the action of warfarin and phenytoin by displacing them from albumin. The dose should begin at 500 mg each night. Chloral hydrate is a safe, generally efficacious hypnotic in the elderly.³

Benzodiazepines are the drugs of choice in the short-term treatment of sleep disorders in the elderly.³ These agents possess a good margin of safety and have less potential for withdrawal and dependence than most other agents. Sleep latency is reduced along with deep and REM sleep. Fewer nocturnal awakenings occur. By paying attention to the onset of action and half-life of these medications, a hypnotic with prompt effect and appropriate duration of action may be selected (Figure 1). Thus, triazolam, with its rapid elimination and intermediate onset of action, is an excellent choice for the elderly, although difficulty with rebound insomnia may be a problem. Alprazolam and



lorazepam, with intermediate elimination and onset, are useful if given several hours prior to bedtime. Temazepam and oxazepam are also reasonable if given far enough in advance of bedtime to be absorbed and have a useful hypnotic effect. Drugs with slow rates of metabolism, such as flurazepam, diazepam, and chlordiazepoxide, are poor choices because of the potential for daytime carryover effects.

In spite of a fair margin of safety, significant side effects and contraindications to benzodiazepine use should be remembered.²¹ Even such short-acting benzodiazepines as triazolam can have significant side effects.²² Excessive drowsiness, a carryover effect, and impaired psychomotor

skills can be particularly troublesome in the elderly. Patients who work at night or perform technical jobs may significantly suffer with benzodiazepine use. The abuse potential and drug interactions, especially when excessive alcohol is consumed, should be kept in mind. Furthermore, patients with severe renal, hepatic, and lung disease may be at particular risk for adverse effects. Sleep disorders, in particular the sleep apnea syndrome and snoring, may be exacerbated by benzodiazepine therapy. Benzodiazepines should be begun at low doses and tapered up to the best effect. Regular evaluation and termination of therapy after a maximum of 3 to 4 weeks is indicated. Short-term benzodiazepine therapy may be particularly useful in the

hospitalized elderly when not contraindicated and other contributing problems are addressed. In the institutional setting, underlying medical and environmental problems should be treated first. Then appropriate sleep hygiene should be initiated. Hypnotics should be reserved for patients with clear-cut transient causes of sleep disturbances.

Special treatment regimens are appropriate for specific sleep disorders. Nocturnal myoclonus responds well to clonazepam and is aggravated by levodopa and tricyclic antidepressants. The physician can treat the restless legs syndrome with phenytoin or clonazepam. For demented patients, low-dose major tranquilizers can be helpful if a careful evaluation for other underlying problems, including depression, is first undertaken.

Sleep Center Referral

When a conservative approach to a sleep disorder in the elderly fails, a referral is warranted. The suspicion of sleep apnea or significant snoring demands sleep center evaluation. A sleep-wake syndrome, nocturnal seizures, narcolepsy, or periodic or daytime hypersomnia with functional impairment also call for referral. Sleep laboratory evaluation is also indicated when seemingly benign problems are unresponsive to changes in sleep hygiene or upon patient request. Referrals should be made to qualified sleep centers where accurate studies can be obtained. While home screening for sleep apnea is being advocated, this approach needs further validation.

SUMMARY

Thus sleep disorders in the elderly are common and can usually be managed by the family physician by treating underlying problems and recommending good sleep hygiene. Chloral hydrate and benzodiazepines are the drugs of choice in the treatment of sleep disorders associated with stress or environmental changes. Appropriate patient education will assure the successful use of these agents. When symptoms are persistent or suggestive of a primary

sleep disturbance, referral to a sleep center or appropriate specialist is warranted.

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