Insomnia: Concerns of the Family Physician

Robert E. Rakel, MD
Houston, Texas

Insomnia is frequently seen in the primary care setting. Although poor sleep can impair daytime functioning and directly affect quality of life, insomnia often goes untreated, resulting in perpetuation and, sometimes, exacerbation of the problem. Reversing this trend requires that family physicians become attuned to complaints of insomnia and respond appropriately. Through education about proper sleep hygiene and stress management, and with the appropriate use of hypnotic agents, most cases of insomnia can be managed effectively by the primary care physician and patient without referral to a sleep specialist.

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Insomnia, a sleep disorder that affects an estimated 95% of all adults at least once in their lives, is a frequently heard patient complaint in the practice of a family physician. Defined as the perception of insufficient or nonrestorative sleep despite an adequate opportunity to sleep, insomnia is often regarded as a transient and benign problem by physicians and patients alike. The drowsiness and chronic fatigue associated with insomnia, however, can adversely affect quality of life and impair a person's ability to concentrate, cope with minor irritations, and enjoy interpersonal relationships.[1–6]

The repercussions of insomnia on society are equally significant. Each year, traffic and industrial accidents attributable to daytime drowsiness cause thousands of injuries and deaths and billions of dollars in damage.[5,7] A study by the American Automobile Association found that driver fatigue accounts for nearly one half of all commercial trucking accidents.[8] Falling asleep behind the wheel is thought to account for 15% to 20% of all freeway accidents and as many as one half of those that are fatal.[9,10] Inattention, fatigue, falling asleep on the job, and other effects of inadequate sleep (particular problems for night-shift workers, who often are chronically sleep deprived) are thought to be the causative factor in many manufacturing accidents once attributed to human error.[4,5,11]

Fortunately, most individuals with insomnia can be effectively treated by the family physician without referral to a sleep specialist or psychiatrist. Diagnosing insomnia and determining possible causes for it usually can be accomplished by questioning patients briefly about their sleep history, taking or reviewing a medical history and performing a thorough physical examination.

Many persons consider insomnia to be a routine consequence of daily life and fail to seek professional assistance. It is important, therefore, that family physicians inquire about sleep habits during patient visits, even when a patient is seeking help for a seemingly unrelated problem. By actively investigating complaints of insomnia and identifying reticent patients who also may be afflicted, family physicians may be able to offer relief from a condition that is associated with substantial morbidity and mortality.

Normal Physiologic Sleep

To feel adequately restored after sleep, the duration of sleep must be optimal (ie, about 8 hours for most adults; more for children and adolescents), and the stages of sleep during the night should follow a normal and predictable pattern. This pattern, referred to as normal physiologic sleep architecture, is characterized by two major types of sleep: REM (rapid eye movement) and NREM

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From the Department of Family Medicine, Baylor College of Medicine, Houston, Texas. Requests for reprints should be addressed to Robert E. Rakel, MD, Department of Family Medicine, Baylor College of Medicine, 5510 Greenbriar, Houston, TX 77030.

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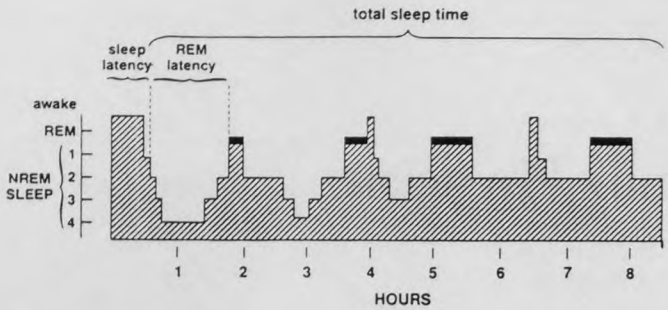

Normal physiologic sleep architecture in a young adult. From Brunton SA.[12] Reprinted with permission of the publisher.

(nonrapid eye movement) sleep (Figure). REM sleep is accompanied by a range of physiologic functions: muscle twitching, eye movement, and blood pressure and heart rate changes; REM sleep is also the phase during which most dreaming occurs. NREM sleep is characterized by a reduction in physiologic activity; brain activity, heart rate, blood pressure, and respiratory rates tend to decline. NREM sleep is further subdivided into four stages, each of which is characterized by a specific electroencephalographic (EEG) pattern. Stage 1 sleep is a brief transitional state that serves as a bridge between wakefulness and sleep. Stage 2 sleep, characterized by EEG patterns known as sleep spindles and K complexes, is thought to ease the body into the deep sleep of stages 3 and 4. Also referred to as slow wave or delta sleep, stages 3 and 4 are thought to provide the most restful sleep.

The relative duration of these sleep stages may vary, depending on age. Many individuals over 65 years of age experience a decrease in the percentage of slow wave sleep, the overall percentage of REM sleep, and REM sleep latency. Elderly persons also may experience more awakenings during the night.[13]

Prevalence and Types of Insomnia

Among all sleep disturbances, insomnia is the most common.[14] Each year, one third of adults report difficulty in falling asleep or maintaining sleep, and 17% consider the problem serious.[15] Insomnia affects persons of both sexes and all ages, races, and socioeconomic groups.[16] It is more prevalent, however, among women, the elderly, those who are divorced, widowed, or separated, persons with chronic medical or psychiatric disorders, those with a history of alcohol or substance abuse, and those with multiple health problems.[15,17,18]

Some patients complain of prolonged periods of sleep loss, whereas others report short bouts of disturbed sleep. The duration of the problem is useful in identifying the underlying cause.

Table 1. Common Situational Stressors That Can Cause Insomnia

Major life changes
Death of a loved one
Marriage
Divorce
Birth of a child
Severe illness in a relative or friend
Moving to a new location
Emotional upset
Marital strife
Work-related problems
Guilt over sexual conflicts
Concerns about health
Test anxiety
Environmental factors
Sleeping in an unfamiliar bed
Excess noise
Light
Extremes in weather
Sleeping in a room that is too warm
Systemic factors
Ingesting alcohol before bedtime
Eating a large meal before bedtime
Disruptions in normal routine
Medical examination
Elective surgery
Hospitalization
Acute pain
Desynchronization of circadian rhythm
Rapid time zone change ("jet lag")
Variable shift work

Transient insomnia, defined as lasting no more than a few consecutive nights and sometimes occurring sporadically, and short-term insomnia, lasting a few weeks, usually are associated with a temporary situational stressor that is often related to work or family life (Table 1). Acute stress, eg, the death of a loved one, the birth of a child, or divorce, and disruptions in daily routine, such as hospitalization, are among the most common causes. Variable work shifts, jet lag, and other factors that can disrupt the biological clock also may play a role in disturbing sleep.

Most cases of chronic insomnia (complaints of poor sleep lasting longer than 3 weeks) are due to underlying medical or psychiatric conditions (Tables 2 and 3). For example, persons with peptic ulcer disease or rheumatologic conditions sometimes experience insomnia because of nighttime pain associated with their illness. Those with major depression or anxiety also are likely to suffer from insomnia. Indeed, as many as one third to one half of those with chronic insomnia are thought to have a psychiatric illness.[20]

Primary sleep disorders, such as nocturnal myoclo-

Table 2. Disorders That Can Cause Chronic Insomnia

Primary sleep disorders
Sleep apnea
Nocturnal myoclonus
Restless legs syndrome
Hypnic jerks
Medical disorders
Asthma
Chronic obstructive pulmonary disease
Coronary or pulmonary insufficiency
Dementia
Epilepsy
Fibrositis
Gastroesophageal reflux
Hypertension
Hyperthyroidism
Parkinson's disease
Peptic ulcer disease
Nocturnal cardiac ischemia
Psychiatric disorders
Major depression
Anxiety
Panic disorder
Obsessive-compulsive disorder
Borderline personality disorder
Post-traumatic stress syndrome
Adjustment disorders
Anorexia nervosa
Dementia
Alcohol and substance abuse
Phobia
Psychologic disorders
Preexisting emotional problems
Inadequate coping strategies
Internalization of emotions
Persistent hypochondria
Obsessive worrying

Table 3. Prevalence of Sleep Disorders and Medical or Psychiatric Conditions Associated with Sleep Disorders

Disorder	Prevalence in the Population
Obstructive sleep apnea	1%–2% (approximate)
Narcolepsy	0.03%–0.16%
Psychophysiological insomnia	15% of patients presenting at sleep disorders clinics; true prevalence unknown
Restless legs syndrome	5%–15% (healthy individuals)
Shift work sleep disorder	2%–5% (accounting for night shift workers only)
Delayed sleep phase syndrome	5%–10% of patients presenting at sleep disorders clinics
Nocturnal leg cramps	Up to 16% of healthy individuals
Primary snoring	40%–50% of men and women over age 65
Major depression	6% (90% of patients with depression have sleep disturbances)
Alcohol abuse	10%
Dementia	5% in individuals over age 65; 15% in those over age 85 (sleep disturbances are common)
Sleep-related asthma	61%–74% have nighttime awakenings
Peptic ulcer disease	<1%

Based on data from the International Classification of Sleep Disorders: Diagnostic and Coding Manual.[19]

nus (repetitive involuntary movements of the extremities during sleep) and restless leg syndrome (in which a peculiar "crawling" sensation occurs in the calves or thighs when lying down), are less frequent causes of chronic insomnia. Sleep apnea, characterized by episodes in which breathing stops during sleep for 10 or more seconds, is a common problem of the elderly and afflicts about 6% of those with chronic insomnia who are referred to sleep disorders centers.[1,21–23]

Other primary sleep disorders can cause daytime drowsiness, directly or indirectly, by disrupting sleep. Hypersomnias, a group of sleep disorders characterized by excessive daytime drowsiness or sleep attacks (periods of sudden, irresistible sleep) not accounted for by an inadequate amount of sleep, often cause individuals to fall asleep unintentionally at work, while driving, or at social gatherings. During an attack of narcolepsy, for example, the person typically sleeps for 10 to 20 minutes and awakens refreshed, but begins to feel sleepy again within 2 or 3 hours, and the pattern repeats itself. During an attack, sudden muscle weakness and other REM sleep phenomena, such as sleep paralysis, occur.

Parasomnias, a group of sleep disorders that represent unpleasant or undesirable phenomena that occur during sleep (eg, nightmares, sleep terrors, sleep talking, and bedwetting), usually do not affect wakefulness. Although most parasomnias do not persist into adulthood and are benign,[24] sleepwalking can place an individual at increased risk for injury.

Diagnosing the Cause of Insomnia

In 1990, sleep disorders were reclassified by the American Sleep Disorders Association into four major categories: dyssomnias, parasomnias, medical/psychiatric sleep disorders, and proposed sleep disorders.[19] Dyssomnias include disorders that may cause insomnia or excessive sleepiness, and are subclassified as intrinsic (eg, psycho-

physiological insomnia, narcolepsy, and restless legs syndrome), extrinsic (which includes transient and short-term insomnia), and circadian rhythm disorders (eg, jet lag syndrome and delayed sleep phase syndrome). Parasomnias are divided into arousal disorders such as sleepwalking and sleep–wake transition disorders such as nocturnal leg cramps, as well as REM sleep parasomnias (eg, nightmares) and other parasomnias such as enuresis and snoring. The third major classification refers to sleep disorders that are associated with medical or psychiatric disorders, including depression, chronic obstructive pulmonary disease, and peptic ulcers. Chronic insomnia commonly results from underlying medical or psychiatric disorders. A fourth category includes sleep disorders that have not yet been confirmed, such as menstrual-associated sleep disorder.[19]

Taking a brief sleep history will elicit information useful in determining whether a person suffers from insomnia or some other sleep disorder, and the possible causes. Patient interviewing can help a physician make a diagnosis of transient insomnia due to jet lag, for example, for a person who has recently returned from a trip that involved crossing several time zones. Insomnia in a newly widowed patient probably was precipitated by the death of the loved one. Early awakening in the morning without symptoms of depression or habituated voluntary early bedtime may signal that the patient's sleep hygiene, ie, habits associated with sleep and waking, is inadequate. In many cases, it is beneficial to interview the patient's bed partner as well, and ask him or her whether the patient snores or stops breathing repeatedly during the night (indicating possible airway obstruction or apnea), or jerks his or her legs while sleeping (indicative of nocturnal myoclonus).

Sleep apnea or other respiratory disorders should be considered in an individual who reports next-day drowsiness, morning headache, irritability, or erectile impotence, or whose bed partner complains of loud snoring. Often, persons with sleep apnea report restless sleep caused by brief arousals that may occur hundreds of times during the night. These "micro-arousals," which occur when breathing resumes following an apneic episode, usually are not perceived by the patient but nonetheless disrupt sleep. Although both sleep apnea and insomnia may result in daytime drowsiness, it is important to differentiate the two, because the management of sleep apnea differs from that of insomnia.

A detailed medical history also should be taken and a physical examination performed to detect any underlying treatable medical or neurologic condition. Determining whether a psychiatric disorder is present also is necessary, and can, to some extent, be elicited in the interview. These underlying medical or psychiatric disorders should be diagnosed and treated accordingly. The physician should consider other possible causes of the insomnia, including a primary sleep disorder, inadequate sleep hygiene, restless legs syndrome, psychopathologic causes, and alcohol abuse.[12] For example, about 10% to 15% of those with chronic insomnia have an underlying problem of abuse of alcohol and other sedatives.[22,25] If, after treatment, the insomnia still persists, a more thorough evaluation of the patient or referral to a sleep medicine specialist may be indicated.

Referral to a sleep medicine specialist is indicated for patients complaining of excessive daytime sleepiness or those who are suspected of having a sleep disorder–related breathing problem.[26] Diagnosis of narcolepsy and nocturnal myoclonus should be confirmed with polysomnography and other tests commonly available in a sleep laboratory. Patients with chronic insomnia also should be referred for additional professional evaluation, particularly when the insomnia has not responded to behavioral or pharmacologic therapy or could not be attributed to a medical or psychiatric cause.[26]

Even when referral to a sleep medicine specialist is necessary, the family physician can still be involved in patient management. This involvement may include consultation with the specialist as well as patient counseling and monitoring.

Management of Insomnia

Most cases of transient and short-term insomnia, as well as chronic insomnia, can be effectively treated in the primary care setting with a variety of therapies, both behavioral and pharmacologic. In most cases of insomnia caused by medical or psychiatric problems, the family physician can initiate treatment and monitor patient response.

When medical and psychiatric causes can be ruled out, improving sleep hygiene (sleep and waking habits) is an important first step in the treatment of insomnia and can be quite effective (Table 4). For example, patients should be instructed to maintain a regular sleep schedule, ie, going to bed and getting up at the same time every day, including on holidays and weekends, and avoid napping. Using earplugs to decrease ambient noise also should be recommended.

Suggesting that the patient keep a "sleep diary," in which he or she logs the time of going to bed, getting up, exercising, and drinking caffeine-containing beverages or alcohol, may prove useful in establishing a sleep–wake routine and identifying possible barriers to good sleep. Sleep hygiene measures, such as spending adequate time in bed, taking two or three timed naps, and avoiding

Table 4. Steps to Improve Sleep Hygiene

- Avoid spending too much time in bed waiting for sleep.
- Avoid daytime naps, as they usually cause poor sleep at night.
- Wake up at the same time each day to maintain circadian rhythm.
- Avoid caffeine, colas, and other stimulants after lunchtime.
- Refrain from drinking alcohol before bedtime, as it causes frequent awakenings and reduces the total amount of sleep time.
- Do not go to bed feeling hungry. Eat foods containing tryptophan, such as milk and tuna, before bedtime.
- Avoid smoking cigarettes.
- Exercise regularly.
- Keep the bedroom at a comfortable temperature. Extremes in temperature can disturb sleep.
- Sleep in a quiet room.

Adapted from Walsh and Mahowald,[26] and Brunton.[12]

alcohol and other sedating substances, also may be helpful in the treatment of narcolepsy, but it is important to note that drug therapy is the primary treatment for this condition.

Regular daytime exercise also can be an effective method for managing sleep disturbances in those with short-term or transient insomnia. Vigorous aerobic exercise has been demonstrated to increase slow wave sleep, the phase of sleep considered the most restful and restorative.[27,28] Strenuous exercise should be avoided, however, in the late evening, as it has a temporary arousing effect.

For those with chronic insomnia, behavioral and biofeedback techniques, such as progressive muscle relaxation, hypnosis, meditation, and systematic desensitization, may be useful. Insufficient data are available, however, to offer clear guidelines for using these techniques.

Often, patients try to compensate for lack of sleep by drinking excess caffeine-containing beverages during the day or alcoholic beverages before bedtime. Patients should be counseled to avoid these beverages within 6 hours of bedtime, as they may disrupt and fragment sleep, and to avoid cigarette smoking. Those who have attempted to control their insomnia with over-the-counter (OTC) sleep aids should be discouraged from using these medications. Nonprescription sleep aids, taken to induce drowsiness, demonstrate low efficacy and paradoxically can cause insomnia.[29] In addition, they have been found to diminish cognitive abilities and daytime performance, and can leave the individual feeling "hungover" the next day.[30] Antihistamines, the primary active ingredient in OTC sleep aids, can produce residual daytime depression of the central nervous system, and may be associated with dizziness, lack of coordination, nervousness, confusion, and delirium.[29–32]

Drug Therapy

Although recently there have been concerns about the safety of some hypnotics, short-term use of these medications is appropriate in certain situations. For example, hypnotics can be particularly useful for persons in acute circumstances, such as during times of personal or professional stress, travel across two or more time zones, hospitalization, and serious illness in a spouse. By providing a good night's sleep, hypnotics can be effective in breaking the cycle of sleeplessness that can result. Although hypnotic therapy is not indicated for persons with chronic insomnia who are depressed or abuse alcohol or drugs, short-term use of hypnotics may be beneficial for some persons with chronic insomnia in the initial stages of treatment.

Although not a cure, hypnotics are an effective temporary means of treatment for those whose primary complaint is insomnia. Such medications can increase total sleep time and improve subjective perceptions of sleep.[33,34] Of the many different classes of hypnotics used to induce sleep, benzodiazepines have been considered the standard treatment because of their high efficacy, wide margin of safety, and relatively low abuse potential (Table 5).

Despite the therapeutic value of these drugs, there are drawbacks associated with their use. Those with a long elimination half-life have been demonstrated to produce next-day sedative hangover effects, as well as to impair daytime behavior, because of their propensity to accumulate.[35–38] Shorter-acting benzodiazepines are associated with hangover effects, rebound insomnia, and a higher risk for anterograde amnesia, compared with longer-acting agents.[39–41]

A new class of short-acting nonbenzodiazepine hypnotics known as imidazopyridines may offer an attractive alternative to benzodiazepines, such as triazolam and temazepam, that are currently prescribed. Zolpidem, the first imidazopyridine to obtain marketing approval, binds preferentially to the omega$_1$ receptor sites in the brain, sites thought to mediate sedative, hypnotic action only.[42–46] In contrast, benzodiazepines appear to bind with equal affinity to several omega receptor subtypes. Some investigators believe that this may account for the unwanted central nervous system side effects, ie, daytime sedation and muscle relaxation, associated with benzodiazepines.[46] In addition to its favorable clinical features, zolpidem has been demonstrated to preserve deep sleep

Table 5. Benzodiazepines Used to Promote Sleep

Agent	Approximate Dosage (mg)	Half-life* (hours)	Comments
Long-acting			
Flurazepam HCl (Dalmane)	15–30	47–100	May be associated with daytime residual effects at 30 mg
Quazepam (Doral)	7.5–15.0	39–73	No apparent rebound insomnia
Intermediate-acting			
Estazolam (ProSom)	1–2	10–24	—
Temazepam (Restoril)	15–30	9.5–12.4	—
Short-acting			
Triazolam (Halcion)	0.25	1.5–5.5	May be associated with rebound insomnia and amnesia
Zolpidem (Ambien)	5–10	1.4–3.8	No apparent next-day residual effects, rebound effects, memory impairment, tolerance, or effects on deep sleep stages

**Includes half-lives of active metabolites.*

(stages 3 and 4), although the clinical significance of this is not known.[45–49]

Tailoring Drug Therapy

In selecting the appropriate sleep medication for individual patients, physicians should take into consideration the particular clinical situation and the needs of the patient.[18] For example, anxiolytic agents, which offer both sedative and anxiety-reducing properties, should be reserved for patients who display inability to fall asleep in combination with symptoms typical of anxiety, such as nervousness, trembling, dizziness, sweating, or complaints of "butterflies in the stomach." Use of these agents should generally be avoided in the elderly, in whom risk for oversedation, ataxia, confusion, reduced energy levels, and paradoxical excitement and delirium is increased.[34]

Sedating antidepressants, which cause immediate and often pronounced changes in sleep, are occasionally used in low doses at bedtime as hypnotic agents for patients with insomnia.[20,50] These drugs are especially useful for patients with major depression who have secondary sleep complaints, and those with previous depressive episodes, dysthymic disorders, anxiety disorders, or a childhood history of hyperactivity.[51] Patients without any of these conditions whose primary complaint is insomnia are best treated with short-term hypnotics. The efficacy and safety of tricyclic antidepressants in the treatment of chronic insomnia has not been demonstrated.[13]

Because of the higher risk for side effects among the elderly, hypnotics should be prescribed conservatively for this population. Only the smallest effective dose should be used, and special attention should be paid to the elimination rate and possible drug accumulation effects. Longer-acting agents, in particular, should be prescribed cautiously because of the higher likelihood of drug accumulation and sedative hangover effects in the elderly.[52]

Hypnotics also should be used with caution in those with a history of alcohol or substance abuse, or those with suicidal tendencies because of the risk of deliberate overdose. Low doses of sedative antidepressants, which have no abuse potential, may be useful in abstinent alcoholics. Hypnotics should be avoided altogether in patients with sleep apnea, those who abuse alcohol or drugs, and those who are currently depressed.

When a hypnotic is indicated, the smallest dose should be prescribed, the duration of treatment should be limited to 1 to 3 nights for transient insomnia and no more than 2 weeks for short-term insomnia, and the drug should be gradually withdrawn following continuous treatment. Intermittent use also is advisable, with skipping of the nightly dosage after 1 or 2 nights of good sleep.[20] In addition, patients should be properly supervised and informed about the proper use of sleep medications. They should be advised not to exceed the recommended dose or the length of treatment specified by the physician. At the same time, patients need to be reassured that hypnotics are safe medications that can effectively break a debilitating cycle of sleeplessness.

Conclusions

Insomnia is associated with substantial costs in terms of morbidity, mortality, and economics. Many of these costs could be prevented, or at least substantially re-

duced, if those suffering from the disorder were identified and treated. Family physicians, by virtue of their role as the main source of care for most patients, are best positioned to actively inquire into sleep habits and concerns about sleep. By asking pertinent questions about sleep patterns, family physicians can identify those suffering from insomnia and provide the treatment necessary to eliminate the daytime drowsiness, fatigue, and other consequences of insomnia that adversely affect the quality of life.

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