National Center on Sleep Disorders Research
and Office of Prevention, Education, and Control

Insomnia

Assessment and Management in Primary Care

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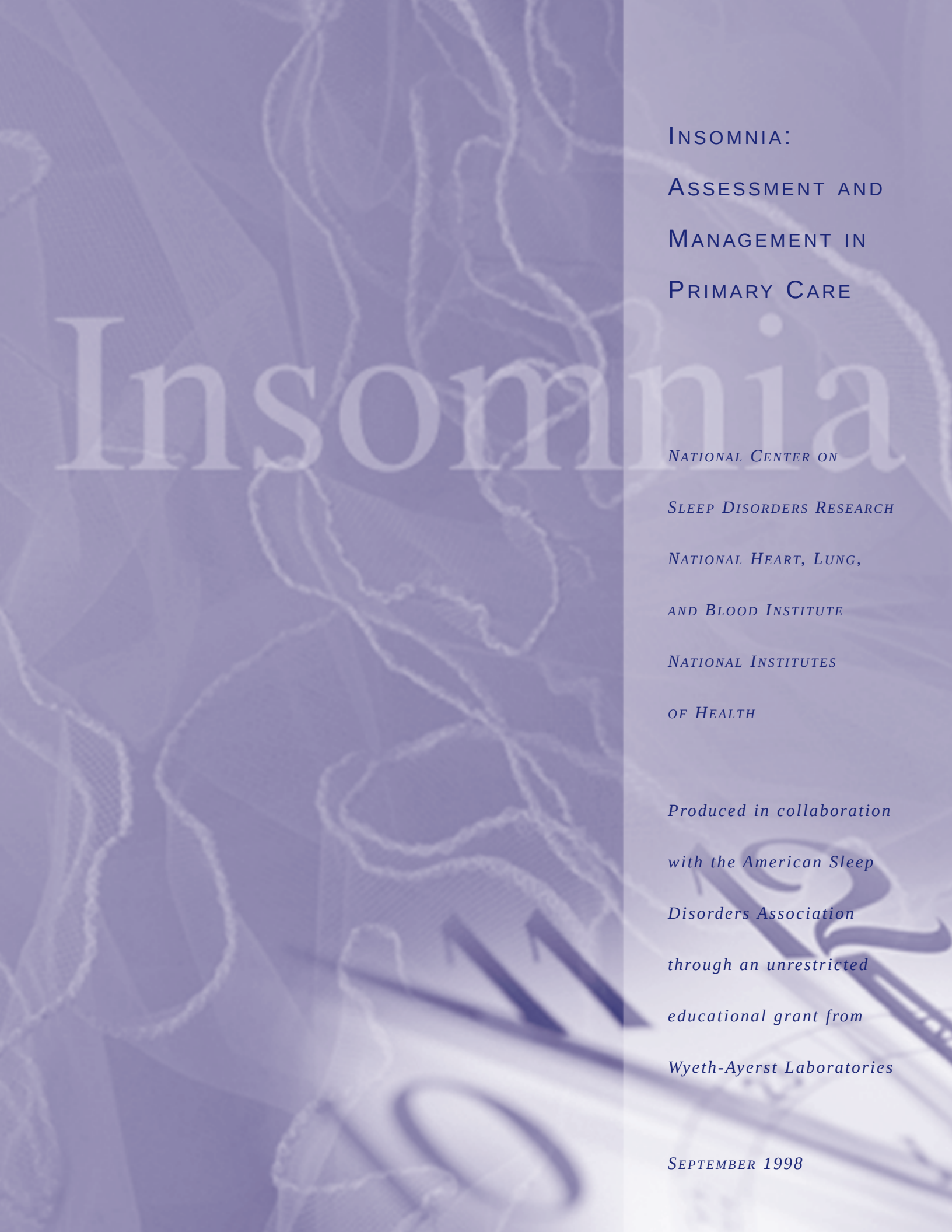

Insomnia: Assessment and Management in Primary Care

National Center on Sleep Disorders Research

National Heart, Lung, and Blood Institute

National Institutes of Health

Produced in collaboration with the American Sleep Disorders Association through an unrestricted educational grant from Wyeth-Ayerst Laboratories

September 1998

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Introduction

As many as one-third of patients seen in the primary care setting may experience occasional difficulties in sleeping, and 10 percent of those may have chronic sleep problems. Although insomnia is rarely the chief reason for an office visit, its detection can be enhanced by incorporating sleep-related questions into the general review of patient systems.

This document offers up-to-date information on insomnia and highlights the key role of the primary care physician in its recognition and management. Behavioral treatments, such as relaxation therapy, sleep restriction therapy, and stimulus control therapy, are described in addition to pharmacological treatments, such as hypnotics, antidepressants, and other medications.

Definition and Prevalence

Insomnia is an experience of inadequate or poor quality sleep characterized by one or more of the following:

- difficulty falling asleep
- difficulty maintaining sleep
- waking up too early in the morning
- nonrefreshing sleep.

Insomnia also involves daytime consequences such as

- tiredness
- lack of energy
- difficulty concentrating
- irritability.

Periods of sleep difficulty lasting between one night and a few weeks are referred to as *acute insomnia*. *Chronic insomnia* refers to sleep difficulty at least three nights per week for one month or more.

About 30 to 40 percent of adults indicate some level of insomnia within any given year, and about 10 percent to 15 percent indicate that the insomnia is chronic and/or severe.[1]

The prevalence of insomnia increases with age and is more common in women.[1,2]

Types of Insomnia

Acute Insomnia

Acute insomnia is often caused by emotional or physical discomfort. Some common examples include significant life stress; acute illness; and environmental disturbances such as noise, light, and temperature.[3] Sleeping at a time inconsistent with the daily biological rhythm, such as occurs with jet lag, also can cause acute insomnia.[4]

Chronic Insomnia

Chronic insomnia can be caused by many different factors acting singly or in combination, and often occurs in conjunction with other health problems. In other cases sleep disturbance is the major or sole complaint, and involves abnormal sleep-wake regulation or physiology during sleep.

Insomnia associated with psychiatric, medical, and neurological disorders. Although psychiatric disorders are a common source of chronic insomnia, they account for less than 50 percent of cases.

Selected Circadian Rhythm Sleep Disorders

- **delayed sleep phase syndrome**
  - — difficulty falling asleep at the desired time
  - — difficulty waking at the desired time
- **advanced sleep phase syndrome**
  - — difficulty staying awake in the evening
  - — waking too early
- **shift worker**
  - — difficulty getting enough sleep during available sleep times

Mood and anxiety disorders are the most common psychiatric diagnoses associated with insomnia.[5,6] Insomnia can also be associated with a wide variety of medical and neurological disorders.[7,8] Factors that cause problems throughout the day such as pain, immobility, difficulty breathing, dementia, and hormonal changes associated with pregnancy, perimenopause, and menopause can also cause insomnia. Many medical disorders worsen at night, either from sleep *per se*, circadian influence (e.g., asthma), or recumbency (e.g., gastroesophageal reflux).

Insomnia associated with medication and substance use. A variety of prescription drugs, nonprescription drugs, and drugs of abuse can lead to increased wakefulness and poor-quality sleep.[9,10] The likelihood of any given drug contributing to insomnia is unpredictable and may be related to dose, lipophilicity, individual differences, and other factors. Some drugs commonly related to insomnia are stimulating antidepressants, steroids, decongestants, beta blockers, caffeine, alcohol, nicotine, and recreational drugs.

Insomnia associated with specific sleep disorders. Insomnia can be associated with specific sleep disorders, including restless legs syndrome (RLS), periodic limb movement disorder (PLMD), sleep apnea, and circadian rhythm sleep disorders.

Restless Legs Syndrome is characterized by unpleasant sensations in the legs or feet temporarily relieved by moving the limbs. Symptoms increase in the evening hours, especially when a person is lying down and remaining still. The dysesthesias cause difficulty falling asleep and are often accompanied by periodic limb movements.

Periodic Limb Movement Disorder is characterized by bilateral repeated, rhythmic, small-amplitude jerking or twitching movements in the lower extremities, and less frequently in the arms. These movements occur every 20 to 90 seconds and can lead to arousals, which are usually not perceived by the patient. Rather, there is a report of nonrefreshing sleep.

Obstructive sleep apnea is most commonly associated with snoring, daytime sleepiness, and obesity, but occasionally can cause insomnia.[11]

Circadian rhythm sleep disorders are characterized by an inability to sleep because of a mismatch between the circadian sleep rhythm and the desired or required sleep schedule. Examples are given in the box above.

Primary Insomnia. When other causes of insomnia are ruled out or treated, remaining difficulty with sleep may be classified as primary insomnia. Factors such as chronic stress, hyperarousal, poor sleep hygiene, and behavioral conditioning may contribute to primary insomnia.[12]

Consequences

The primary consequences of *acute insomnia* are sleepiness, negative mood, and impairment of performance. The severity of these consequences is related to the amount of sleep lost on one or more nights.

Patients with *chronic insomnia* frequently complain of fatigue, mood changes (e.g., depression, irritability), difficulty concentrating, and impaired daytime functioning. Because insomnia has a variety of causes, the consequences may not be uniform. For example, when objectively assessed, the level of daytime sleepiness may be elevated with periodic limb movement disorder[13] and rheumatoid arthritis,[14] but not in primary insomnia.[15]

Insomnia appears to contribute to increased rates of absenteeism,[16] health care utilization,[17] and social disability.[17,18]

Recognition and Assessment

A brief sleep history incorporated into the routine review of systems can be helpful in detecting insomnia. Direct inquiry is important because more than half of the people who believe that they have chronic insomnia have never discussed their problems with a physician. Examples of appropriate questions are shown in the box below. It is helpful for the patient to keep a 1- to 2-week sleep diary. Sleep diaries usually record bedtime, total sleep time, time to sleep onset, number of awakenings, use of sleep

Sleep/Wake Profile

- How has the patient been sleeping recently?

Suggested Questions Following a Complaint of Insomnia

- When did the problem begin? (to determine acute vs. chronic.)
- Does the patient have a psychiatric or medical condition that may cause insomnia?
- Is the sleep environment conducive to sleep (relative to noise, interruptions, temperature, light)?
- Does the patient report "creeping, crawling, or uncomfortable feelings" in the legs relieved by moving them? (Relates to restless legs syndrome.)
- Does the bed partner report that the patient's legs or arms jerk during sleep? (Relates to periodic limb movements in sleep.)
- Does the patient snore loudly, gasp, choke, or stop breathing during sleep? (Relates to obstructive sleep apnea.)
- Is the patient a shift worker? What are the work hours? Is the patient an adolescent? (Relates to circadian sleep disorders/sleep deprivation.)
- What are the bedtimes and rise times on weekdays and weekends? (Relates to poor sleep hygiene.)
- Does the patient use caffeine, tobacco or alcohol? Does the patient take over-the-counter or prescription medications (such as stimulating antidepressants, steroids, decongestants, beta blockers)? (Relates to substance-induced insomnia.)

Signs of Sleepiness

- What daytime consequences does the patient report?
- Does the patient report dozing off or difficulty staying awake during routine tasks, especially while driving?

General Sleep Hygiene Measures

Sleep hygiene measures may help promote sleep in all people. Sleep hygiene measures involve health practices and environmental influences relating to sleep.

- Wake up at the same time of day.
- Discontinue caffeine 4 to 6 hours before bedtime, and minimize total daily use. Caffeine is a stimulant and may disrupt sleep.
- Avoid nicotine, especially near bedtime and upon night awakenings; it is also a stimulant.
- Avoid the use of alcohol in the late evening to facilitate sleep onset; alcohol can cause awakenings later in the night.
- Avoid heavy meals too close to bedtime, as this may interfere with sleep. A light snack may be sleep-inducing.
- Regular exercise in the late afternoon may deepen sleep; vigorous exercise within 3 to 4 hours of bedtime may interfere with sleep.
- Minimize noise, light, and excessive temperature during the sleep period.
- Move the alarm clock away from the bed if it is a source of distraction.

medications, time out of bed in the morning, and a rating of subjective quality of sleep and daytime symptoms. The sleep diary provides a night-to-night account of the patient's sleep schedule and perception of his or her sleep. Moreover, it may serve as a baseline for assessment of treatment effects. Completing the diary each morning, and using estimates rather than exact times, should minimize the likelihood that the process itself will be disruptive to sleep. See table 1 for a sample sleep diary.

Assessment should include questions that address both sleep and daytime functioning, mainly because sleep needs vary markedly from person to person. One patient sleeping 6 hours may feel totally unrefreshed, while another one may be sleeping 6 hours but have no complaints during the day.

Although the ability to maintain sleep decreases with age, the need for sleep does not change significantly. A complaint of simply not sleeping "a full 8 hours" but otherwise having restorative sleep is within the bounds of normal behavior, and reassurance may be all that is needed. However, a complaint of severe insomnia or excessive daytime sleepiness should prompt an evaluation, regardless of the patient's age.[19]

Management

Introduction

Often the cause of *acute insomnia* (no one episode lasts longer than several weeks) is related to a single specific event. The need for treatment is usually determined by the severity of the daytime sequelae, the duration of the episode, and the degree to which episodes become predictable. Even brief episodes of acute insomnia may warrant treatment because individuals who are typically good sleepers can and do become significantly sleepy after loss of just a few hours of sleep on one or more nights.[20] Also, there is a possibility that untreated acute insomnia may develop into a chronic, learned insomnia.

Table 1

SAMPLE SLEEP DIARY

Name _____

	EXAMPLE					
Complete in AM						
Date	*Monday, 4/10*					
Bed Time (of previous night)	*10:45 p.m.*					
Rise Time	*7: 00 a.m.*					
Estimated time to fall asleep (previous night)	*30 minutes*					
Estimated # of awakenings & total time awake (previous night)	*5 times 2 hours*					
Estimated amount of sleep obtained (during previous night)	*4 hours*					
Complete in PM						
Naps (Time & Duration)	*3:30 p.m. 45 minutes*					
Alcoholic Drinks (Number & Time)	*1 drink @ 8:00 p.m. 2 drinks @ 9:00 p.m.*					
List stresses experienced today	*Flat tire Argued w/son*					
Rate how you felt today 1 - Very tired/sleepy 2 - Somewhat tired/sleepy 3 - Fairly alert 4 - Wide awake	*2*					
Irritability 1=Not at all / 5=very	*5=very*					
Medications						

When the insomnia persists beyond a night or two, or becomes predictable, treatment should be considered. Pharmacological treatment usually predominates—especially the use of short-acting hypnotics. Adjunctive sleep hygiene measures may also be useful. See box on page 10. The goal of treatment is to improve the patient's sleep, but it may not be possible to achieve normal sleep every night.

Chronic insomnia is often a significant therapeutic challenge. Since chronic insomnia is often multifactorial in etiology, multiple treatment modalities may be needed for any one patient. If an underlying medical or psychiatric condition is identified, this condition should be treated first. In some patients, the mechanisms that maintain the insomnia are more important than precipitating factors.

If the complaint of chronic insomnia appears to be primary or persists after treatment of an underlying condition, two general treatment approaches are available—behavioral and pharmacological. Usually pharmacological treatment provides rapid symptom relief, but long-term treatment is unstudied. Behavioral approaches take a few weeks to improve sleep but continue to provide relief after training sessions have been completed.[21]

Behavioral Treatment

Behavioral interventions seek to change maladaptive sleep habits, reduce autonomic arousal, and alter dysfunctional beliefs and attitudes, which are presumed to maintain insomnia. These therapies have been shown to produce reliable and durable improvements for patients with chronic primary insomnia.[22] At times, the various behavioral treatments are compatible with each other and can be combined, although it is not clear whether increased therapeutic benefit results.

Relaxation Therapy. Relaxation therapy is based on observations that insomnia patients often display high levels of physiologic, cognitive, and/or emotional arousal, both at night and during the daytime. There are several relaxation methods although none has been shown to be more efficacious than the others. Progressive muscle relaxation, autogenic training, and EMG biofeedback seek to reduce somatic arousal (e.g., muscle tension), whereas attention-focusing procedures such as imagery training or meditation are intended at lowering presleep cognitive arousal (e.g., intrusive thoughts, racing mind). Abdominal breathing is often a component of various relaxation techniques, or it may be used alone. Relaxation therapy is useful for both sleep onset and maintenance insomnia. All these techniques require regular practice with a trained professional over a period of several weeks.

Sleep Restriction Therapy. Poor sleepers often increase their time in bed in a misguided effort to provide more opportunity for sleep, a strategy that is more likely to result in fragmented and poor-quality sleep. Sleep restriction therapy[23] consists of curtailing the amount of time spent in bed to increase the percentage of time asleep. This improves the patient's sleep efficiency (time asleep/time in bed). For example, a person who reports staying in bed for 8 hours but sleeping an average of 5 hours per night would initially be told to decrease the time in bed to 5 hours. The allowable time in bed per night is *increased* 15 to 30 minutes as sleep efficiency improves. Adjustments are made over the weeks until an optimal sleep duration is achieved. Typically, it is best to alter bedtime and keep the rise time constant in order to maintain a regular sleep-wake rhythm. By creating a mild state of sleep deprivation, this therapy promotes more rapid sleep onset and more efficient sleep. To minimize daytime sleepiness, time in bed should not be reduced to less than 5 hours per night. Sleep restriction therapy is modified in older adults by allowing a short afternoon nap.[21]

Stimulus Control Therapy. Stimulus control therapy[24] is based on the premise that insomnia is a conditioned response to temporal (bedtime) and environmental (bed/bedroom) cues usually associated with

sleep. The main objective of stimulus control therapy is to reassociate the bed and bedroom with rapid sleep onset. Stimulus control instructions involve (a) going to bed only when sleepy; (b) using the bed and bedroom only for sleep; (c) getting out of bed and going into another room when unable to fall asleep or return to sleep easily, and returning to bed only when sleepy again; (d) maintaining a regular rise time in the morning regardless of sleep duration the previous night, and (e) avoiding daytime napping. Clinical trials have documented the efficacy of stimulus control therapy for both sleep onset and sleep-maintenance insomnia.[25,26]

Cognitive Therapy. Cognitive therapy involves identifying dysfunctional beliefs and attitudes about sleep and replacing them with more adaptive substitutes. For example, patients who believe that sleeping 8 hours per night is an absolute necessity to function during the day are asked to question the evidence and their own experience to see if this is true for them. Those who are convinced that insomnia is destroying their ability to enjoy life are encouraged to develop more adaptive coping skills and to cease viewing themselves as victims. These attitudinal changes often help to minimize anticipatory anxiety and arousal that interfere with sleep.

Pharmacological Treatment

Hypnotic Medications. The primary indication for hypnotic medication is the short-term management of insomnia—either as the sole treatment modality or as adjunctive therapy until the underlying problem is controlled. The most common type of medications used to promote sleep are the benzodiazepine receptor agonists. These compounds have all been shown to be effective in inducing, maintaining, and consolidating sleep as compared with a placebo.[27] Patients report significant relief of both nighttime and daytime symptoms.[28] There are small differences between compounds in their ability to induce and maintain sleep based on rate of absorption and elimination. The most common side effect of these drugs is anterograde amnesia and, for long-acting drugs, residual daytime drowsiness. Currently an estimated 10 to 15 percent of hypnotic users take them regularly for more than 1 year,[29] although there are little safety or efficacy data to guide their use beyond 2 to 3 months. While selected patients may benefit from chronic use, there are no clear indications of which patients might benefit from chronic therapy.

Dose, pharmacokinetic properties (absorption rate, distribution, elimination half-life), and risk-benefit ratio are the key factors in selecting the most appropriate medication. Dose is the single best predictor of the frequency of side effects reported with these medications. It impacts both the peak amount of a drug in the body as well as the duration of action of the medication. Once an effective dose is established, increasing the dose rarely leads to increased efficacy but does reliably predict an increase in the frequency of side effects.

Elimination half-life varies considerably among hypnotics and is the best predictor of next-day residual effects. For patients who need to be alert because of occupational or societal demands, short-acting medications are preferred. However, patients with insomnia and high levels of daytime anxiety may benefit more from long-acting medications. It is important to remember that the volume of distribution and rate of metabolism for most of these medications slow with age. This leads to higher drug concentrations and a longer duration of action.

Hypnotic medications are contraindicated in pregnant women, patients with untreated obstructive sleep apnea, patients with a history of substance abuse, and patients who might need to awaken and function during their normal sleep period. Finally, patients with hepatic, renal, or pulmonary disease need to be monitored more carefully than otherwise healthy insomniacs.

Antidepressants. It is very common for sedating antidepressants to be prescribed for insomnia, often in low dose, but there is little scientific evidence to support the efficacy or safety of this approach in most types of insomnia. When prescribed to

patients with major depression, sedating antidepressants improve subjective and objective measures of insomnia,[30] and sleep symptoms often improve more quickly than other symptoms of depression. When administered concurrently with "alerting" antidepressants, low doses of sedating antidepressants such as trazodone again improve insomnia.[31] However, in nondepressed individuals there are minimal data upon which to recommend use of antidepressants.[32]

Antidepressants have a range of adverse effects including anticholinergic effects, cardiac toxicity, orthostatic hypotension, and sexual dysfunction (selective serotonin reuptake inhibitors [SSRIs]). Tricyclic antidepressants and SSRIs can exacerbate RLS and PLMD in some individuals. The lethal dose/effective dose ratio for tricyclics is worse than for benzodiazepines.

With little scientific evidence supporting the efficacy and safety of antidepressants in insomnia, the clearest indications are for patients with insomnia associated with psychiatric disorders or a previous history of substance abuse.

Antihistamines. Drugs that antagonize central histamine-1 receptors have sedative effects. The most common antihistamines used for insomnia are diphenhydramine and hydroxyzine; most over-the-counter sleep aids include an antihistamine. Few recent studies assess the efficacy of antihistamines for treating insomnia, but older studies demonstrate subjective and objective improvements during short-term treatment.[33] The long-term efficacy of antihistamines for insomnia has not been demonstrated. Adverse effects associated with antihistamines include daytime sedation, cognitive impairments, and anticholinergic effects. Tolerance and discontinuation effects have been noted.[29]

Melatonin. Melatonin has several physiological actions, including a phase-shifting effect on circadian rhythms, increased sleepiness when administered during daytime hours, and vasoconstriction. Its mechanisms of action are unknown but may involve interaction with melatonin receptors in the suprachiasmatic nucleus. The role of melatonin in treating any sleep-related disorder remains to be defined.[34] Clinical studies in patients with insomnia have provided inconsistent results.

Other Drugs. Barbiturates and a number of older non-benzodiazepine, non-barbiturate drugs such as chloral hydrate, methyprylon, and meprobamate are still available. These drugs are not recommended for treatment of insomnia because of their narrow therapeutic ratio, rapid development of tolerance, systemic toxicity, potential for abuse, and possibility of severe clinical complications on withdrawal. Finally, a variety of herbal preparations (e.g., valerian root, herbal teas), nutritional substances (e.g., L-tryptophan), and over-the-counter drugs are also promoted for the treatment of insomnia. In general, there is little scientific evidence for the efficacy or safety of these products.

Conclusion

Sleep disturbance is a reliable predictor of psychological and/or physical ill health. Thus a report of disturbed sleep signals the need for further evaluation. Physicians should inquire about sleep during periodic patient assessments. Insomnia is often associated with psychiatric or medical illness, sometimes as the primary or first symptom of a problem. Effective treatments for insomnia are available. For some patients, improvement in sleep leads to an improved quality of life.

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HUMAN SERVICES

Public Health Service
National Institutes of Health
National Heart, Lung, and Blood Institute

NIH Publication No. 98-4088
September 1998