

Chronic Insomnia

Key Points

1. Chronic insomnia is present in 10–15% of the population.
2. Predisposing factors include family history of insomnia and depression.
3. Precipitating factors include stress and changes in routine.
4. Inadequate sleep hygiene can perpetuate chronic sleep apnea.
5. Cognitive behavioral therapy is more effective than hypnotics for the treatment of chronic insomnia.

Introduction

Chronic insomnia is a relatively common condition that affects an estimated 10–15% of Americans. Some studies have narrowly defined insomnia as a delay of more than 30 minutes from bedtime to sleep or a sleep efficiency less than 85%. There are, however, persons who meet these criteria, yet have no problem with daytime functioning or sleepiness.¹⁻³ Table 1 provides criteria which link sleep difficulties despite adequate opportunity to clinically relevant sequelae. When these symptoms are present for more than a month, this constitutes chronic insomnia. If decrements in sleep efficiency occur mainly after initial sleep onset, this is considered sleep maintenance insomnia as opposed to sleep onset insomnia. Regardless of the timing of sleep difficulties, insomnia can be categorized as primary or secondary. Primary insomnia has no identifiable causes. Secondary insomnias include those associated with mental disorders, drug or substance abuse, or a medical condition. This discussion will focus on primary insomnia, its risk factors, perpetuating factors and treatment.

Table 1.³ Features of Insomnia

1. Complaint of difficulty initiating sleep, difficulty maintaining sleep, or waking up too early, or sleep that is chronically nonrestorative or poor in quality.
2. Sleep difficulty occurs despite adequate opportunity.
3. At least one of the following forms of daytime impairment related to the nighttime sleep difficulty is reported:
 - Fatigue or malaise
 - Attention, concentration, or memory impairment
 - Adverse impact on school, work, or social activities
 - Mood disturbance or irritability
 - Daytime sleepiness
 - Lack of energy or motivation
 - Driving errors
 - Tension, headaches, or gastrointestinal symptoms
 - Excessive worries about sleep loss

Risk Factors

Numerous studies have shown that women are more prone to insomnia.⁴⁻⁶ Divorced, separated, or widowed persons are also known to have higher rates of insomnia. Unemployed groups such as homemakers and retirees are more prone to sleep difficulties, whereas students are not. European Americans report more insomnia than their African American counterparts, who in turn have higher rates compared to Caribbean-born persons of the same race.⁷

Multiple medical conditions are associated with higher prevalence of insomnia. It is well-known that mental disorders are associated with insomnia. In fact, insomnia may be part of the spectrum of depression and anxiety disorders. Digestive, respiratory, arthritic, renal and prostate disorders can also increase the chance of insomnia.

Morbidity

It is difficult to determine whether insomnia leads to depression or vice versa. In the general population, surveys have indicated 3% of persons with insomnia due to depression. When depression is a result of insomnia, mood often improves following a few nights of good sleep. By contrast, persons in the throes of a major depression may have insomnia as a feature, but if they happen to get better sleep through hypnotics or a buildup of sleep debt, mood does not usually improve. In a study of male medical students with insomnia compared to controls, there was a three-fold increase in the cumulative incidence of depression over 40 years. As part of the Sleep Heart Health Study subjects were studied for the linkage between short sleep and hypertension. A 1.66-fold increase in hypertension for those sleeping less than six hours compared with controls was found. For sleep ranging between six to seven hours per night, the odds ratio was 1.19. Although sleep requirements vary across the population, it is generally accepted that, on average, seven to eight hours per night are needed.⁸⁻¹¹

Models of Insomnia

In the physiologic model of insomnia, the level of arousal in an individual is intrinsically higher, which makes it more difficult for that person to initiate and maintain sleep. An important consideration is whether the heightened arousal is a tonic or an episodic phenomenon. Various parameters have been measured as estimates of the level of arousal for insomniacs compared with controls. Body temperature was found to be elevated throughout the day for insomniacs compared with controls, whereas heart rate was relatively elevated only during sleep. ACTH and cortisol levels have also been higher among patients with insomnia versus controls. Interestingly, these differences were greatest in the early part of the night. Functional imaging techniques, such as single photon emission computed tomography (SPECT) and positron emission tomography (PET), have also been used to estimate CNS arousal. The data is inconclusive with PET showing increased cerebral glucose metabolism and SPECT showing hypoperfusion for insomnia patients compared with controls. These techniques, along with the newer modality of functional magnetic resonance imaging (MRI), are promising but further work is needed to clarify the issue.¹²⁻¹⁵

Another way to frame the pathology of insomnia is the cognitive model of insomnia which uses the concepts of predisposing, precipitating and perpetuating factors. Predisposing factors for insomnia typically involve

inherited traits, as well as congenital factors such as scoliosis or cerebral palsy with associated chronic pain. The “type A” personality, or individual who tends to worry, are examples of traits that can increase the chance for insomnia. Precipitating factors include life events and/or environmental factors that disturb the normal routine. The loss of a spouse or loved one, as well as job stress, can just as easily begin a cycle of insomnia as well as depression. A change in the home or bedroom environment, such as a new pet or moving to a locale near an airport or freeway, can also be harbingers for sleep disturbance. Perpetuating factors consist of the habits that people develop with the intention of correcting insomnia but which can paradoxically worsen and reinforce the cycle of difficulty initiating or maintaining sleep. These behaviors are often grouped under the heading of inadequate sleep hygiene which will be explored in more detail below.

Psychophysiologic Insomnia

This is one of the more common forms of primary insomnia. It is best understood in the context of the cognitive model of sleep disturbance. In this setting, persons have learned associations between the bed, bedroom and bedtime, which decrease the propensity for sleep. Many people can recall routines in their childhood in which their parents would urge them to “get into pajamas and brush their teeth so that mom or dad could read them a bedtime story.” It is no accident that the setting of routines such as these is known to induce sleepiness. Sleep is not simply a physiologic phenomenon in which a person can get into bed under any circumstance and expect to drift off to dreaming. Successful induction of sleep requires the proper mindset. This is why being “keyed up” or anxious can greatly reduce the likelihood of sleep. Psychophysiologic insomnia is the experience of becoming more keyed up when the bed, bedroom or bedtime is approached. By convention and through the experience and efforts of many sleep specialists, certain markers have been codified as representative of this condition. The International Classification of Sleep Disorders, 2nd edition defines it as: Insomnia for at least one month with evidence of conditioned sleep difficulty and/or heightened arousal in bed with associated features.⁸ (Table 2)

Table 2.¹⁶ Psychophysiological Insomnia

1. Excessive focus on and heightened anxiety about sleep.
2. Difficulty falling asleep in bed at the desired bedtime or during planned naps, but no difficulty falling asleep during other monotonous activities when not intending to sleep.
3. Ability to sleep better away from home than at home.
4. Mental arousal in bed characterized by intrusive thoughts or inability to cease sleep-preventing mental activity.
5. Heightened somatic tension in bed reflected by inability to relax the body sufficiently to allow onset of sleep.

Common behaviors in this setting include clock watching, rumination and progressive worrying about sleep as evening approaches. If patients relate that they feel tired on the couch but then upon getting into bed they become much more alert, this is a red flag for psychophysiologic insomnia. Another way to get at the diagnosis is to ask if vacations are a time when sleep is “no problem at all.” Treatment options include pharmacologic and behavioral techniques as outlined below.

Paradoxical Insomnia

Another subtype of chronic insomnia is, in one sense, not insomnia at all. Paradoxical insomnia, also known as sleep state misperception, consists of individuals who believe they are not sleeping or give histories of incredible sleep deprivation such as “I’ve only slept one hour a night for the past two months.” Many of the same traits and tendencies which characterize the cognitive model of chronic insomnia can be present such as excessive worrying and rumination. Often these people are unable to be convinced by discussion alone that they are in fact obtaining sleep. The best method of diagnosis, and hopefully treatment, is an overnight polysomnogram. Even then in some instances patients need extended psychologic counseling to dispel delusional thinking. It is not hard to imagine that these cases are often complicated by psychiatric comorbidity and it is important to pursue thorough evaluations for such comorbidities.

Idiopathic Insomnia

This is an often unrelenting insomnia which begins during infancy or childhood. Although it is suspected that inherited or congenital abnormalities in the brainstem play a role, this has never been documented. Treating this condition can be challenging, but typically involves behavioral techniques.

Inadequate Sleep Hygiene

This does not represent a separate insomnia subtype, but rather a set of maladaptive routines that constitute some of the “perpetuating factors” for insomnia. Activities such as frequent daytime naps, irregular sleep and wake times, and stimulating mental or physical behaviors near bedtime can all disrupt the normal circadian rhythm of sleep. Other habits such as excessive time in bed not sleeping, as well as eating, reading or watching television in bed can build up an association between the bed and arousal. Substances including caffeine, nicotine and alcohol near bedtime have all been shown to disrupt sleep initiation and/or sleep maintenance. In some instances, behaviors such as napping, sleeping in and lying in bed trying to sleep arise because of anxiety about the perceived consequences of not getting enough sleep. Worries that “I will lose my job if I’m too tired” or “being tired over time will directly impact my health” can drive these maladaptive routines.

Pharmacologic Treatment

Historically, barbiturates, antihistamines and benzodiazepines have been used to treat insomnia. If sleep maintenance insomnia or early morning awakenings are the main issue, benzodiazepines with an intermediate half-life (six to eight hours) such as temazepam and estazolam may still be the best choice. Newer non-benzodiazepine hypnotics such as zolpidem, zaleplon and eszopiclone are now often preferred due to their more favorable side effect profile. Nonetheless, caution should be observed when placing someone on these medications for the first time, especially older individuals. In some cases it may be appropriate to advise an older person to take the first dose on a night when they do not have to drive early the next morning.

In patients with comorbid depression, tricyclics such as Nortriptyline or Trazodone may be particularly effective. Caution is advised for use of Trazodone in males given increased risk for priapism. In younger individuals without many comorbidities, over the counter sleep aids such as diphenhydramine may still be tried as an initial, inexpensive treatment.

Pharmacologic approaches are most effective in the setting of an acute or adjustment insomnia (<1month). For chronic insomnia, behavioral techniques including cognitive behavioral therapy are generally more effective.

Behavioral Treatment

A number of approaches have been developed to correct faulty beliefs about sleep and extinguish behaviors that maintain the cycle of insomnia. A few of the major treatments are listed in Table 3.

Table 3.¹⁷ Behavioral Treatment of Insomnia

1. **Stimulus Control**
Instructions to re-associate the bed and bedroom with sleep.
2. **Sleep Restriction**
Limiting time in bed relative to the reported sleep time in order to build up mild sleep deprivation and increase sleep drive at bedtime.
3. **Relaxation Training**
Progressive muscle relaxation, imagery guidance and meditation designed to decrease somatic and intrusive thoughts.
4. **Cognitive Behavioral Therapy**
Psychotherapeutic intervention to eliminate delusions about sleep and the short-term consequences of daytime sleepiness.
5. **Sleep Hygiene Education**
Guidelines for behaviors that will promote sleep onset at normal bedtimes.

One way to organize these treatments is to begin with suggestions for good sleep hygiene. This includes tapering off caffeine, smoking cessation and eliminating alcohol use within three hours of bedtime. Avoiding late meals (within two to three hours of bedtime) is also helpful. At the same time, application of stimulus control techniques complements sleep hygiene counseling. This includes regular wake and sleep times (even on the weekend), no exercise near bedtime and avoiding naps. In addition, getting up out of bed after 15–20 minutes if unable to sleep and engaging in quiet activity in low light such as reading (use a 40 watt bulb or dimmer) can promote sleep. Once tired, the individual should return to bed. Television or computer work/play can be stimulating due to bright lights and should be avoided. It is also important to reserve the bed for sleep and intimacy. Reading, watching TV, eating and paperwork in bed are discouraged. In some instances, TV or radio when used as “white noise” can actually be helpful as long as there is no bright light. A sleep log should be kept for at least two weeks with instruction to follow the above guidelines for at least one to two months. A short course of hypnotics during this period may be used but is not necessary.

In situations where the initial approaches are not successful, cognitive behavioral therapy may be tried. This typically involves more intensive counseling consisting of six to eight weekly sessions with a trained psychologist to apply all the above techniques, with reinforcement as well as psychotherapy to break down faulty beliefs which are often present with refractory chronic insomnia. In this setting insomnia patients

can be reassured, for example, that avoiding naps and building up sleep drive will not lead to immediate dire health, or professional or personal consequences. This, however, does not obviate the need for routine safety recommendations, such as pulling over to the side of the road if sleepy when driving. Studies have shown cognitive behavioral therapy to be superior to pharmacotherapy alone for the treatment of chronic insomnia.^{18,19}

Special Considerations

It is important to note that a polysomnogram is not necessary in the setting of true insomnia, unless sleep apnea or periodic limb movements in sleep are suspected. An important distinction should be maintained between insomnia and certain circadian rhythms such as Delayed Sleep Phase Disorder. These individuals, sometimes called “night owls,” are often young persons who cannot get to sleep early and have difficulty arising at normal times. The difference between these persons and insomnia patients is that given the opportunity to shift their sleep schedule, they have no problem falling asleep. Treatment involves shifting sleep timing, not improving sleep, per se.

Conclusion

In conclusion, chronic insomnia is a condition that affects many people but can be treated successfully with the proper tools.

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CME Questions 3a-c

Please select the best answer for the following:

- 3a. Chronic insomnia can be perpetuated by all of the following behaviors except:
 - a. Nap at noon each day
 - b. Reading in bed
 - c. A 30 minute jog five hours before bedtime
 - d. Waking two hours later on weekends
- 3b. Which treatment is indicated for excessive worries regarding sleep:
 - a. Stimulus control
 - b. Sleep restriction
 - c. Sleep hygiene education
 - d. Cognitive behavioral therapy
- 3c. Overnight polysomnography is required as part of the evaluation of isolated true insomnia:
 - a. True
 - b. False