

Helping Patients with Insomnia: A Guide for the Primary Care Physician

Case Study and Commentary, *Leslie M. Swanson, PhD, and J. Todd Arnedt, PhD*



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Program Audience

Primary care physicians.

Educational Needs Addressed

Insomnia affects an estimated 5% to 10% of the general population and can cause significant distress and functional impairment. Chronic insomnia (persistent symptoms for > 1 month) is a risk factor for the development of mood disorders and is associated with chronic medical problems, substance use, falls in the elderly, absenteeism, and decreased quality of life. Insomnia remains under-recognized and undertreated in the primary care setting; therefore, it is important that primary care physicians be familiar with the diagnosis and treatment of this disorder.

Educational Objectives

After participating in this CME activity, primary care physicians should be able to

1. Identify the causes of insomnia
2. Discuss how to assess an insomnia complaint to make a valid diagnosis
3. List the available pharmacologic treatments for insomnia
4. Describe the components of cognitive behavioral therapy for insomnia

CASE STUDY

Initial Presentation



A 37-year-old woman presents to her primary care physician complaining of difficulty falling asleep.

History

The patient describes a 3-year history of problems falling asleep. On most nights, she spends between 1 and 3 hours trying to fall asleep. She reports that she was always a "light sleeper" and easily aroused from sleep but was able to fall asleep consistently within 30 minutes. Her problems began around the time that she lost her job and was experiencing significant financial strain. She found new employment, but the difficulty falling asleep persisted. Currently, she reports daytime fatigue, irritability, increased errors at work, and headaches in response to sleep loss.

On further questioning, the patient reports that she sleeps 2 hours later on the weekends and naps for an hour each weekday to compensate for poor sleep. She watches television and reads in bed when she cannot sleep. She describes being sleepy and tired around her usual bedtime, but once she gets into bed she feels more awake, her mind becomes active and focused on her inability to sleep, and she worries about how her lack of sleep will impact her functioning the next day.

The patient has no evidence of snoring, witnessed apneas, gasping, or choking during sleep, and she denies symptoms suggestive of narcolepsy, restless legs syndrome (RLS), or periodic limb movement disorder (PLMD). Other than the occasional headache due to sleep loss, her medical history is negative for chronic medical conditions, including hypertension, cardiovascular disease, chronic pain conditions, and gastroesophageal reflux disease. The patient reports that she saw a counselor for approximately 1 year after she lost her job 3 years ago but denies a history of major depressive disorder, anxiety, or other psychiatric disorders. She currently does not take any medications, although she reports trying zolpidem for 6 months when her sleep problems began. She drinks 3 cups of coffee throughout

From the Department of Psychiatry, University of Michigan, Ann Arbor, MI.

morning and early afternoon. She has no history of tobacco or illicit drug use. She consumes 3 alcoholic beverages per month. Her family history is significant for insomnia and depression in her mother.

The patient's score of 5 on the Epworth Sleepiness Scale [1] is within the normal range. Her score of 18 on the Insomnia Severity Index [2] indicates moderately severe insomnia.

Physical Examination

Physical examination reveals a weight of 130 lb, height of 65 in, body mass index of 21.6 kg/m², blood pressure of 105/70 mm Hg, and neck circumference of 13 in. Oropharyngeal examination is within normal limits (a positive finding would be consistent with possible sleep-disordered breathing). Cranial nerves II through XII are intact bilaterally. Muscle tone, bulk, and strength are normal in all 4 extremities. Recent laboratory results reveal normal hormone levels.

• What is insomnia and how common is it?

Insomnia is the most common sleep disturbance and is characterized by problems with sleep initiation, maintenance, and/or quality and associated distress and functional impairments. Insomnia can be primary or comorbid with psychiatric disorders, medical conditions, or other sleep disorders. Historically, insomnia due to another condition or disorder was referred to as secondary insomnia. More recently, recognition of the limited understanding of the mechanistic pathways and direction of causality between insomnia and other conditions has led to a call for this type of insomnia to be termed comorbid insomnia [3].

Insomnia is considered acute or transient when symptoms occur for less than 1 month and chronic when symptoms persist for longer than 1 month. Acute insomnia is typically associated with an identifiable stressor or life change. To be diagnosed as a disorder, insomnia symptoms must occur for more than 1 month and cause significant distress or functional impairment. Epidemiologic studies suggest that approximately 30% of adults in the general population have persistent symptoms of insomnia, 10% to 20% of adults experience chronic insomnia, and approximately 10% of adults have symptoms of chronic insomnia with associated daytime consequences [4,5]. The few studies that have estimated the prevalence of adults who meet diagnostic criteria for insomnia as outlined in the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) have documented rates between 5% to 10% in the general population [5,6].

The morbidity associated with chronic insomnia is well

established. Chronic insomnia is a risk factor for mood disorders and is associated with chronic medical problems and substance use [5,7–10]. Other consequences of insomnia include absenteeism [11], falls in the elderly (independent of medication use) [12], and a decreased quality of life [13]. Untreated insomnia imposes a significant cost burden. Direct costs (eg, inpatient, outpatient, emergency department, pharmacy) for patients with untreated insomnia over the 6-month period prior to diagnosis were found to be \$924 higher in adults younger than 65 years and \$1143 higher for adults 65 years and older as compared with patients without insomnia. Indirect costs (ie, absenteeism) were \$405 greater for patients with insomnia as compared with individuals without insomnia [14]. Despite the personal and societal costs associated with chronic insomnia, it remains underrecognized and undertreated in primary care settings.

• What causes insomnia?

The causes of insomnia are multiple and varied. Insomnia (primary and comorbid) is perhaps best conceptualized by the multifactorial model proposed by Spielman and colleagues [15], which takes into account predisposing, precipitating, and perpetuating factors. Specifically, this model posits that there are factors that initially predispose an individual to developing insomnia, factors that trigger an episode of insomnia, and factors that serve to maintain insomnia over time. Predisposing factors are intrinsic characteristics that increase personal vulnerability to insomnia, such as physiologic hyperarousal [16]. Predisposing factors alone do not cause insomnia but are thought to decrease the threshold for its onset. Precipitating factors are events that trigger the onset of insomnia. These factors may take the form of a developmental change (eg, puberty, menopause) or a life change (eg, stressful experiences within the domains of family, health, or work) [17].

Once initiated, perpetuating factors may maintain insomnia even after resolution of the initial precipitant or once the individual accommodates to its presence. Common perpetuating factors include behavioral strategies employed to compensate for poor sleep (eg, irregular sleep schedules, daytime napping) [18,19], use of alcohol to induce sleep [18], efforts to deal with the consequences of insomnia (eg, excessive caffeine intake [20]), conditioned presleep arousal within the bedroom environment or around the usual bed time [21], and maladaptive sleep-related thoughts (eg, focus on adverse consequences of sleep loss, unrealistic expectations for sleep, concern about inability to sleep) [22,23]. Optimal treatment for chronic insomnia would target all 3 factors that contribute to the initiation and maintenance of insomnia.

- **What factors may be contributing to this patient's insomnia?**

According to this patient's history, predisposing factors include her history of easily disrupted and light sleep, which may suggest a sensitive sleep system, and her family history of insomnia and depression. She experienced a significant stressor (ie, job loss) around the time of the onset of her insomnia, which would be considered the precipitant for her sleep difficulties. The patient began engaging in behaviors (eg, sleeping late on the weekends and napping) to compensate for poor sleep. Furthermore, she started to read and watch television in bed when she could not sleep, which may have conditioned the bed as a place of arousal. These behaviors served to perpetuate the insomnia, even after the initial stressor of financial strain was resolved.

- **How is an insomnia disorder diagnosed?**

The diagnosis of insomnia is made based on clinical history. A well-crafted clinical interview can elicit the most common differential diagnosis. Goals for assessment of insomnia in primary care include characterization of the insomnia complaint, identification of precipitating and perpetuating factors, and identification of other disorders/conditions that may affect treatment decisions.

Characterize the Insomnia Complaint

Eliciting a sleep history, beginning with the patient's chief complaint, is the first step in the assessment for insomnia. Polysomnography is not necessary to diagnose insomnia and is not indicated unless another sleep disorder is suspected, such as sleep-disordered breathing or PLMD. Complaints of difficulty initiating and/or maintaining sleep are suggestive of insomnia, whereas a chief complaint of excessive daytime sleepiness/fatigue or nonrestorative sleep in the absence of prolonged sleep initiation or nighttime awakenings may be more suggestive of sleep-disordered breathing. Patients should be asked how long the chief complaint has been present, how frequently it occurs, and how it affects their functioning, including level of sleepiness/fatigue, impairments in social/occupational functioning, or increased errors/accidents attributed to the sleep problem. Patients who report drowsiness should be cautioned about the dangers associated with driving and operating heavy machinery, and if necessary, these activities should be suspended until treatment is initiated and symptoms improve.

Identify Precipitating and Perpetuating Factors

Patients who report daytime consequences or distress about their sleep should receive further assessment. To identify any obvious precipitants of insomnia, inquire about any life changes (within the domains of family, health, and work), developmental changes (eg, puberty, menopause), environmental or sleep schedule changes (eg, travel, shift work), mood changes, and overall stress level. Encourage the patient to manage precipitating factors as he/she is able and reassure him/her that sleep will likely return to baseline levels once the precipitant has resolved. If daytime functioning is sufficiently impaired or if the patient reports significant distress about the sleep problem, pharmacologic or nonpharmacologic treatments for insomnia may be initiated. However, patients commonly present after the precipitant has resolved and perpetuating or maintaining factors have begun. Therefore, it is important to ask about such factors as well to make informed treatment decisions.

Both behavioral and cognitive factors are involved in perpetuating insomnia. Behavior-related questions include: Do you nap during the day? Do you use caffeine past early afternoon? Does you have an irregular sleep schedule (eg, sleep later on the weekends)? Do you alcohol before bed? Spend a lot of time in bed? Do you use the bed for activities other than sleep and sexual activity? Cognitive-related questions include: Are you worried and anxious about sleep? Do you spend time during the day thinking about sleep and insomnia? Does your mind race when trying to sleep? Are your sleep expectations unrealistic (eg, "I need 8 hours of sleep every night to function.")? Are you catastrophizing the level of functional impairment after poor nights of sleep (eg, "I can't function if I don't sleep well.")?

Questionnaires such as the 16-item Dysfunctional Beliefs and Attitudes About Sleep Scale can be used to assess for cognitive factors [24]. Patients who endorse perpetuating factors may be good candidates for interventions directed at modifying these factors (ie, cognitive behavioral therapy for insomnia, discussed below).

Identify Comorbid Conditions

Treatment for other sleep disorders is significantly different from treatment for insomnia. Therefore, it is important to consider other sleep disorders that may be contributing to the patient's chief complaints of insomnia, including obstructive sleep apnea [25], RLS [26], and PLMD [27]. In patients with chief complaints of sleep onset problems or early morning awakenings, circadian rhythm disorders, such as delayed sleep phase syndrome and advanced sleep phase syndrome, should be considered [28].

Sleep-disordered breathing is characterized by intermittent or cyclical diminished or absent respiratory effort

during sleep and is commonly associated with excessive daytime sleepiness, frequent nocturnal awakenings, and complaints of nonrefreshing sleep even with sufficient sleep quantity [28]. Patient or bed partner reports of snoring, gasping, choking, or witnessed episodes of disrupted breathing during sleep may indicate sleep-disordered breathing. The Berlin Questionnaire is a validated self-report questionnaire that can be used in primary care to identify patients at high-risk for sleep-disordered breathing who may require a referral to a sleep disorders center [29].

Diagnostic criteria for RLS have been recently developed and include: (1) an urge to move the legs, often accompanied by unpleasant sensations in the legs, such as tingling, shock-like sensations, or “creepy-crawling”; (2) an urge to move or sensations that begin or worsen with inactivity; (3) symptoms that at least partially improve with sustained movement; and (4) symptoms that are worse in the evening than during the day or that occur exclusively in the evening [30]. Because RLS symptoms are worse in the evening, the patient’s ability to initiate or maintain sleep can be affected. PLMD is commonly comorbid with RLS [31]. Patients with PLMD have repetitive lower extremity movements during sleep that are associated with arousals. Reports of leg twitching or jerking by a patient’s bed partner is suggestive of PLMD, but diagnosis requires an overnight sleep study.

In circadian rhythm sleep disorders, the circadian rhythm (ie, the endogenously generated 24-hour cycle of behavior and physiology) is misaligned with societal and physical environments [28]. In these disorders, sleep quality is generally adequate when the patient is allowed to select his/her own sleep schedule. Problems emerge when the patient must conform to sleep schedules driven by societal requirements. Difficulty initiating sleep and waking at the socially desired time in the morning, or falling asleep much earlier and waking much earlier than desired, are suggestive of a circadian rhythm sleep disorder. Diagnosis is confirmed with actigraphy, an objective measurement of sleep-wake patterns that can be sustained over a period of time, or subjective report of sleep patterns using a sleep diary.

Specific sleep and psychiatric measures may also be used to further determine symptom severity and potential comorbid conditions. A sleep diary, maintained for 1 to 2 weeks, is a simple method for evaluating sleep patterns (Figure). The Insomnia Severity Index [2], a widely used measure of insomnia severity, is a short self-report sleep questionnaire that can be easily administered and scored during a primary care visit. Other relevant self-report measures include the Pittsburgh Sleep Quality Index [32], which assesses sleep quality, and the Epworth Sleepiness Scale [1], which assesses daytime sleepiness. Psychological screening is important to detect an underlying mood or anxiety disorder, which are the most common conditions associated with insomnia.

Questionnaires such as the Beck Depression Inventory [33], Beck Anxiety Inventory [34], Quick Inventory of Depressive Symptomatology Self-Report [35], and Patient Health Questionnaire [36] can be used to determine if the patient is experiencing significant psychological distress that may be influencing his/her sleep.

In the context of a busy primary care practice, the goals for assessment of the insomnia patient should be to elicit sufficient information to initiate treatment (if appropriate) and to determine if referral to a sleep specialist or other provider is required for more extensive evaluation and treatment. Key aspects of such an assessment include defining the nature of the insomnia complaint (frequency, severity, and duration), identifying precipitating and perpetuating factors, and determining whether another sleep, medical, or mental disorder is likely contributing to the insomnia complaint.

• What are the differential diagnoses?

The diagnostic criteria for insomnia differ depending on the nosology. Furthermore, different types of practitioners may rely on different classification and diagnostic systems. For example, primary care practitioners commonly use the ICD-9 or ICD-10, whereas mental health clinicians frequently rely on the DSM-IV. Sleep medicine practitioners, by contrast, often use the *International Classification of Sleep Disorders, Second Edition* to diagnose sleep disorders.

Primary Versus Comorbid Insomnia

Primary versus comorbid insomnia is the main differential diagnosis in insomnia. Primary insomnia occurs in approximately 10% to 15% of patients presenting for treatment and refers to insomnia that occurs in the absence of other medical or psychiatric conditions. In most cases, insomnia complaints are explained by a comorbid psychiatric or medical diagnosis [37]. Buysse and colleagues [37] examined the diagnoses of patients presenting for evaluation of insomnia and found that more than 75% of patients had insomnia related to a psychiatric disorder [37]. Mood disorders (eg, depression) are the most common psychiatric conditions associated with insomnia [9,37]. Other psychiatric conditions associated with insomnia include anxiety disorders (eg, posttraumatic stress disorder) and substance use disorders. Insomnia can occur with medical conditions, including high blood pressure, breathing problems, urinary problems, chronic pain, and gastrointestinal problems [10]. A variety of prescription drugs, over-the-counter (OTC) medications, and psychoactive substances can also disrupt sleep and lead to insomnia. Furthermore, discontinuing some medications can lead to sleep disturbances associated with withdrawal [38].

Complete at Night					Complete in Morning in reference to last night								
Day and Date	Tobacco used (eg, number of cigarettes, rettes, chews)	Number of alcoholic drinks (1 standard drink = 12 oz beer, 1.5 oz liquor, 5 oz wine)	Caffeine consumed	Naps start and end	Any medications used for sleep (name & dosage)	Last night, I went to bed at:	Last night I turned out the lights at:	After lights out, I fell asleep in:	Number of times I woke up during the night was:	Once I fell asleep, I was awake for a total of:	This morning, I got out of bed at:	Last night, the quality of my sleep was:	This morning I feel:
Sunday (example) 7/12	8	1	2 coffees, 2 oz chocolate	10:00 AM–12:00 PM	Trazodone 50 mg; Ambien 10 mg	11:15 AM/PM	11:20 AM/PM	1 hr, 15 min	3	45 min	6:55 AM/PM	2	3
Monday						AM/PM	AM/PM				AM/PM		
Tuesday						AM/PM	AM/PM				AM/PM		
Wednesday						AM/PM	AM/PM				AM/PM		
Thursday						AM/PM	AM/PM				AM/PM		
Friday						AM/PM	AM/PM				AM/PM		
Saturday						AM/PM	AM/PM				AM/PM		

Figure. Sample sleep diary.

Table 1. Medications Approved by the U.S. Food and Drug Administration for Treatment of Insomnia

Drug	Dose Range, mg (Older Adults)	T _{max} , hr	T _{1/2} , hr	Indications and Comments
Benzodiazepines				
Estazolam (ProSom)	1–2 (0.5–1)	0.5–1.6	10–24	Sleep maintenance; potential residual sedation
Flurazepam (Dalmane)	15–30 (15)	3–6	50–100	Sleep maintenance; potential residual sedation
Quazepam (Doral)	7.5–15 (7.5)	2	25–100	Sleep maintenance; potential residual sedation
Temazepam (Restoril)	15–30 (7.5–15)	2–3	10–17	Sleep maintenance; possible rebound insomnia
Triazolam (Halcion)	0.125–0.5 (0.125)	1–2	1.5–5.5	Sleep onset; possible rebound insomnia
Nonbenzodiazepines				
Eszopiclone (Lunesta)	1–3 (1-2)	1	~ 6	Sleep onset/maintenance; data on 6-mo nightly use
Zaleplon (Sonata)	5–20 (5)	1	~ 1	Sleep onset
Zolpidem (Ambien)	5–10 (5)	1.6	2.5	Sleep onset
Zolpidem CR (Ambien CR)	6.25–12.5 (6.25)	1.5	2.8	Sleep onset/maintenance; data on 24-wk non-nightly use
Melatonin receptor agonist				
Ramelteon (Rozerem)	8	0.5–1.5	1–2.6	Sleep onset; no tolerance or dependence; unscheduled

Clues that insomnia is comorbid with another diagnosis include a temporal link between the onset of insomnia symptoms and another disorder and the course in which insomnia symptoms wax and wane with the primary condition. Although comorbid insomnia is often not independently treated, there are frequently reasons to treat comorbid insomnia. Studies of individuals with comorbid insomnia have documented improvement of the comorbid condition after insomnia has been treated [39,40]. Additionally, insomnia frequently persists after the comorbid condition is resolved [41]. Studies suggest that comorbid insomnia can be successfully treated with both hypnotics [39] and cognitive behavioral therapy [42]. A recent study of 545 patients with depression and insomnia found that clinician-rated mood improved faster and remission was more likely in patients treated with fluoxetine plus eszopiclone compared with fluoxetine plus placebo [39].

- **What are management strategies for insomnia?**

Treatment for primary and comorbid insomnia includes pharmacologic (prescription and nonprescription) and non-pharmacologic options. The most commonly prescribed pharmacologic agents for insomnia are nonbenzodiazepine medications, benzodiazepines, and antidepressants [43]. Patients also frequently use OTC medications to induce sleepiness (eg, antihistamines, dietary supplements such as melatonin and herbal products). First-line treatments for insomnia include the pharmacologic agents outlined in **Table 1** and cognitive behavioral therapy for insomnia.

Pharmacologic Therapy

Medications currently approved by the U.S. Food and Drug Administration (FDA) for the treatment of insomnia include benzodiazepines (estazolam, flurazepam, quazepam, temazepam, triazolam); the newer nonbenzodiazepine medications (zolpidem, eszopiclone); and a melatonin receptor agonist (ramelteon). These medications are considered first-line treatments for the acute management of insomnia because of their demonstrated efficacy, safety in both young and elderly patients, and favorable side effect profiles [3,44–46]. Meta-analyses indicate that compared with placebo, both benzodiazepine and nonbenzodiazepine medications produce significant improvement in most sleep parameters, including time to fall asleep, time spent awake during the night, total sleep time, and sleep quality [44,47].

Benzodiazepines are indicated for short-term management of insomnia (ie, ≤ 4 weeks); data on longer-term use of these medications are limited. Side effects of benzodiazepines include daytime sedation, rebound insomnia, fatigue, adverse effects on the internal structure of sleep (including decreased slow-wave sleep), and the potential for dependence, tolerance, and withdrawal effects. Caution should be exercised when prescribing benzodiazepines to elderly patients, as there is evidence that chronic benzodiazepine use is associated with an increased risk of injury and cognitive impairment in this population [48,49]. The advantages of the newer nonbenzodiazepine medications for insomnia as compared with traditional benzodiazepines include data supporting longer-term use, a more favorable side effect profile, and no disruption of sleep architecture (eg, no reduction in slow-wave sleep). Although side effects of these medications are less severe, nonbenzodiazepines are more likely to

produce headache, dizziness, nausea, and daytime sedation as compared with placebo [47].

Recent randomized controlled trials of nightly eszopiclone and non-nightly extended-release zolpidem indicate sustained sleep improvements over 6 months and enhanced quality of life and work functioning compared with placebo [50–52]. However, in general, the long-term efficacy and safety of nonbenzodiazepines requires further investigation.

The more recently approved ramelteon has shown some promise in improving latency to persistent sleep in patients with primary insomnia [53] but is less appropriate for patients with principally sleep maintenance complaints. Ramelteon may be valuable for patients with circadian rhythm disturbances, but studies of efficacy and safety are needed.

Despite evidence favoring FDA-approved medications as first-line treatment, some antidepressants (eg, trazodone, amitriptyline, mirtazepine) and atypical antipsychotics (eg, olanzapine, quetiapine) are increasingly prescribed off-label for insomnia because of their sedative properties. The equivocal efficacy data, worse adverse event profile relative to approved agents, and uncertainty about efficacy and safety with long-term use limit their indication for the treatment of chronic insomnia.

Despite widespread availability, use, and perceived safety of OTC medications and dietary supplements for insomnia [54], insufficient efficacy and safety information exists to recommend them as viable treatment options [55].

Cognitive Behavioral Therapy

Cognitive behavioral therapy for insomnia (CBTI) is based on the multifactorial model of insomnia described by Spielman et al [15]. CBTI is a short-term treatment (4–8 sessions) that integrates cognitive- and behaviorally based treatment modalities to specifically target the factors believed to perpetuate the episode of insomnia. **Table 2** provides an overview of the various components of CBTI and their treatment targets.

The behavioral component of CBTI consists of sleep restriction, stimulus control procedures, and relaxation training. Sleep restriction involves restricting the amount of time the patient spends in bed trying to sleep (ie, reducing sleep opportunity) to approximate actual sleep time, with a minimum of 5 hours in bed. For example, a patient who sleeps an average of 6 hours per night but spends 8 hours in bed would be instructed to spend no more than 6 hours per night in bed. This procedure is believed to increase sleep drive through mild sleep deprivation, thereby facilitating sleep onset and maintenance [56]. Once sleep is consolidated, sleep opportunity is gradually increased until optimal daytime functioning is achieved.

Stimulus control is a set of instructions designed to associate temporal (bedtime) and environmental (bed, bedroom) cues with rapid sleep onset and to establish a regular sleep-

Table 2. Components of Cognitive Behavioral Therapy for Insomnia

Component	Techniques	Target
Stimulus control	Stay out of bed when unable to sleep for 15–20 minutes; use of bed for sleep and sexual activity only; limit naps (see Table 3)	Associate environmental (ie, bed, bedroom) and temporal (ie, bedtime) cues with rapid sleep onset
Sleep restriction	Decrease time spent in bed to approximate actual sleep time (minimum, 5 hours)	Increase sleep drive through mild sleep deprivation to facilitate rapid sleep onset and maintenance
Relaxation	Progressive muscle relaxation, deep breathing, autogenic training, meditation, visual imagery	Decrease level of arousal
Cognitive techniques	Automatic thought logs; education about common sleep-related cognitive distortions; challenges of distorted thoughts	Development of more adaptive appraisals of sleep
Sleep hygiene	Engage in regular exercise. Maintain a cool (65°F) bedroom. Avoid napping, substance use close to bedtime, warm baths/showers or exercise within 3 hours of bedtime, caffeine use late in the day (see Table 4)	Education about how daytime habits and sleep environment can affect sleep

wake schedule [57]. **Table 3** lists commonly used stimulus control instructions. These instructions include staying out of bed when not able to sleep for 15 to 20 minutes, using the bed only for sleep and sexual activity, limiting napping, and rising at the same time each morning. Stimulus control is usually used in conjunction with sleep restriction.

Relaxation training is frequently used in CBTI to help individuals decrease their level of arousal. Various relaxation techniques have demonstrated benefit in improving symptoms of insomnia, including progressive muscle relaxation, meditation, and autogenic training [58]. The patient is instructed to practice such techniques on a daily basis.

The cognitive component of CBTI consists of patient education about the role of negative sleep-related thoughts in perpetuating sleep problems. Patients are taught how to identify their own negative sleep-related thoughts and are encouraged to challenge these cognitions with more adaptive appraisals of sleep. Patients are also educated about “sleep hygiene,” which refers to daytime habits (eg, exercise, napping, substance use close to bedtime) and environmental

Table 3. Stimulus Control Instructions

1. Get into bed to go to sleep only when you are sleepy
2. Avoid using the bed for activities other than sleep (eg, do not read, watch TV, eat, or worry in bed). Sexual activity is the only exception to this rule. On these occasions, follow the instructions afterwards when you intend to go to sleep
3. If you find yourself unable to fall asleep within 15–20 minutes, get out of bed and go into another room. Remember, the goal is to associate your bed with falling asleep quickly. If you are in bed for more than about 15–20 minutes without falling asleep and have not gotten up, you are not following this instruction. Return to bed intending to go to sleep only when you are very sleepy
4. While out of bed during the night, engage in activities that are quiet but of interest to you. Do not exercise, eat, smoke, or take warm showers or baths. Do not lie down or fall asleep when not in bed
5. If you return to bed and still cannot fall asleep within 15–20 minutes, repeat Step 3. Do this as often as necessary throughout the night
6. Set your alarm and get up at the same time every morning irrespective of how much sleep you got during the night. This will help your body to acquire a consistent sleep-wake rhythm
7. Do not nap during the day

Adapted with permission from Bootzin RR, Nicassio PM. Behavioral treatments for insomnia. In: Hersen M, Eisler R, Miller P, editors. *Progress in behavior modification*. New York: Academic Press; 1978:1–45.

circumstances (eg, temperature regulation, bed comfort) that can help or hinder sleep. Patients are encouraged to apply sleep-promoting sleep hygiene practices in their daily lives. Sleep hygiene recommendations are summarized in **Table 4**.

Several studies have supported the efficacy of CBTI and have documented its durability and reliability in both younger and older patients with chronic insomnia [45,58–62]. Approximately 70% to 80% of patients with chronic insomnia benefit from CBTI [58]. Studies have also shown that patients who benefit from CBTI maintain treatment gains as long as 2 years [58].

As with any treatment, there are limitations to CBTI. First, there are few professionals trained in behavioral sleep medicine. Thus, access to well-trained and certified CBTI providers is limited. A list of certified providers of CBTI is available at www.aasmnet.org/BSMSpecialists.aspx. Second, CBTI can be costly, especially for patients with insurance that does not cover such treatments. Third, it can be a challenge to implement the behavioral changes prescribed in CBTI, and consistent adherence is essential for success.

Recent randomized controlled trials of head-to-head comparisons between pharmacotherapy and CBTI document the superiority of CBTI for patients with primary insomnia [63,64]. In a study comparing CBTI alone, zolpidem alone,

Table 4. Sleep Hygiene Instructions

- Eat regular meals every day
- Make the last hour before bed a “wind-down” time. Have a *light* carbohydrate snack (eg, crackers, bread, cereal) during this time
- Do not consume more than 8–10 oz of liquids in the evening
- Do not consume caffeinated products (eg, coffee, tea, soda, chocolate) in the evening
- Do not use alcohol to help you sleep or consume alcohol too close to bedtime
- Smoking and other drugs will disrupt your sleep
- Do not nap during the day
- Exercise regularly, but do not engage in activities that raise body temperature (eg, warm bath) within 3 hours of bedtime
- Make sure that your bed is comfortable
- The temperature of your bedroom should be comfortable and on the cool side (around 65°F)
- Make sure that your bedroom is dark and quiet
- Spend time outside in the light each day

and combined CBTI plus zolpidem in 63 adults with chronic sleep-onset insomnia, CBTI alone was found to produce equivalent or better results in sleep latency and sleep efficiency as compared with zolpidem alone or CBTI plus zolpidem [64]. These results were consistent at midtreatment, post-treatment, and 12-month follow-up. Sivertsen and colleagues [63] compared zopiclone (a nonbenzodiazepine related to eszopiclone) with CBTI in patients aged 55 years and older with chronic insomnia. Patients receiving CBTI demonstrated significant improvements after treatment relative to baseline on sleep efficiency, increased slow-wave sleep, and wake after sleep onset, as measured by polysomnography. These improvements were greater than those seen in patients receiving zopiclone and were maintained at 6-month follow-up.

Treatment Selection

Several factors should be considered when deciding whether to use a pharmacologic or nonpharmacologic approach to treating a patient with insomnia [65]. Although studies have documented the efficacy of pharmacotherapy and CBTI, no single treatment option has demonstrated effectiveness for all patients with insomnia. In general, pharmacotherapy is the preferred initial treatment strategy for acute insomnia, whereas CBTI is a better first-line treatment for chronic insomnia. However, patient preference is an important factor. Some patients are unable or unwilling to make the commitment required for CBTI, and, conversely, some patients do not wish to use medications to treat their insomnia.

The principal reason to select pharmacotherapy as a first-line treatment for acute insomnia is the relatively rapid effects of drugs as compared with CBTI [65]. Rapid symptom relief

during the acute phase of insomnia may prevent the development of perpetuating factors that often lead to chronic insomnia [66]. Pharmacotherapy may also be a better initial treatment strategy in patients with unstable physical or mental illness when there is concern that components of CBTI may exacerbate a comorbid condition (eg, restricting sleep in a patient with bipolar disorder), in patients with low motivation for behavior change (as may be seen in patients with comorbid depression [67]), when there is limited availability of a trained CBTI provider, or limited resources to pay for a course of CBTI.

The factors believed to perpetuate insomnia are unlikely to be treated by pharmacotherapy, and chronic insomnia frequently returns following discontinuation of medications. Thus, CBTI, which directly targets perpetuating factors, is the best first-line treatment for chronic insomnia [63,64]. Furthermore, the durability of CBTI provides a significant advantage over pharmacotherapy [58]. CBTI can also be considered in patients who are unable or unwilling to take medications, in those who have failed previous medication trials, or in patients who have insomnia that persists following discontinuation of a medication. Additionally, research suggests that insomnia that is comorbid with conditions such as chronic pain or cancer can be successfully treated with CBTI. This may be helpful when patients are already taking multiple medications for the comorbid condition [40,68].

Treatment in This Patient

 The patient was prescribed zolpidem 10 mg by her primary care physician. The medication was initially effective, but the patient's insomnia returned over time. The patient decided that she preferred not to use sleep medications over the long term, and she discontinued the medication. Given the chronic nature of the insomnia, the patient was referred to a psychologist and specialist in behavioral sleep medicine for a trial of CBTI.

The patient attended 6 sessions of CBTI. Two weeks of baseline sleep diaries revealed the following nightly averages: sleep latency of 90 minutes, wake during the night of 60 minutes, total sleep time of 5.5 hours, and time in bed of 8.5 hours, which resulted in a sleep efficiency of 65% (time asleep/time in bed \times 100). Based on the information from these diaries, the patient was initially prescribed a 5.5-hour sleep opportunity (ie, nightly time spent in bed), which she agreed to be 1:00 AM to 7:30 AM, in combination with stimulus control instructions. She was also instructed to avoid napping.

After 2 weeks, the patient's sleep efficiency improved to 89%, and her sleep opportunity was expanded in 20-minute increments every 4 days over the next 4 weeks. The patient was taught progressive muscle relaxation, educated about sleep hygiene, and learned how to recognize and modify her maladaptive cognitions about sleep. By session 6, the

patient was spending a nightly average of 7.5 hours in bed and sleeping a nightly average of 7 hours, which increased her sleep efficiency to 93%. The patient's daytime symptoms of fatigue, irritability, increased mistakes at work, and headaches also significantly improved.

CONCLUSION

Chronic insomnia is a common disorder that is associated with increased risk for mood disorders, substance use, and medical problems, yet it is underrecognized in primary care. By asking questions about a patient's sleep patterns during the primary care encounter, insomnia may be more frequently identified and treated.

Corresponding author: Leslie M. Swanson, PhD, 4250 Plymouth Rd., Ann Arbor, MI 48109, lmswan@med.umich.edu.

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CME EVALUATION: Helping Patients with Insomnia: A Guide for the Primary Care Physician

DIRECTIONS: Each of the questions below is followed by several possible answers. Select the ONE lettered answer that is BEST in each case and circle the corresponding letter on the answer sheet.

1. Which of the following is a common perpetuating factor for insomnia?
 - A. Irregular sleep schedule
 - B. Life changes
 - C. Low iron levels
 - D. Physical illness
2. Which of the following statements is TRUE?
 - A. A diagnosis of insomnia does not require overnight polysomnography
 - B. Chronic insomnia is not a risk factor for mood disorders
 - C. Primary insomnia is the most common type of insomnia
 - D. Treatment for other sleep disorders is similar to the treatment for insomnia
3. A recent head-to-head comparison of cognitive behavioral therapy for insomnia (CBTI) and zolpidem for primary insomnia found:
 - A. Zolpidem was superior to CBTI
 - B. CBTI was superior to zolpidem
 - C. CBTI plus zolpidem produces better treatment effects
 - D. CBTI and zolpidem were equivalent
4. Sleep restriction is thought to work by which of the following?
 - A. Associating bedtime cues with rapid sleep onset
 - B. Changing environmental habits that hinder sleep
 - C. Decreasing arousal level before bedtime
 - D. Increasing sleep drive through mild sleep deprivation
5. Which of the following statements is FALSE?
 - A. Both traditional benzodiazepines and the newer nonbenzodiazepine medications produce significant improvement in most sleep parameters
 - B. Research has shown sustained sleep improvements when eszopiclone is taken nightly over 6 months
 - C. Traditional benzodiazepines decrease slow-wave sleep
 - D. Trazodone is approved by the U.S. Food and Drug Administration for the treatment of insomnia

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