



Cognitive behavioral therapy for insomnia in adults

AUTHOR: Jennifer L Martin, PhD

SECTION EDITOR: Ruth Benca, MD, PhD

DEPUTY EDITOR: April F Eichler, MD, MPH

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INTRODUCTION

Cognitive behavioral therapy for insomnia (CBT-I) is a multicomponent treatment for chronic insomnia disorder that aims to identify and target the multiple cognitive and behavioral factors that lead to the chronic nature of disrupted sleep. CBT-I is the mainstay of nonpharmacologic therapy for insomnia disorder and is preferred over medications as first-line therapy for chronic insomnia.

This topic reviews the conceptual basis, components, and delivery of CBT-I and other behavioral treatments for insomnia in adults. An overview of the treatment of insomnia and pharmacologic therapies for insomnia are presented separately. (See "[Overview of the treatment of insomnia in adults](#)" and "[Pharmacotherapy for insomnia in adults](#)".)

THEORETICAL FRAMEWORK

Insomnia disorder, once conceptualized as a common secondary symptom of other conditions, is now viewed as an independent sleep disorder worthy of clinical attention, even in the context of comorbidities [1,2]. Two core conceptual frameworks underlie the rationale for treatment of insomnia disorder with cognitive behavioral therapies (CBTs). The theories are not mutually exclusive and provide a conceptual framework for the development and treatment of insomnia.

- **Predisposing, precipitating, and perpetuating factors** – One theory suggests that insomnia develops in some individuals as a result of predisposing, precipitating, and

perpetuating factors ([table 1](#)) [3]. Predisposing factors are conceptualized as risk factors and may include genetic risk, early life experiences, and some chronic comorbidities. Precipitating events are life events that lead to an acute disruption in sleep, such as an illness, injury, or symptom exacerbation; a change in social factors, such as living situation or marital status; or a traumatic event. Multicomponent CBT-I directly addresses perpetuating factors, which are believed to be the source of ongoing, chronic sleep-related problems.

- **Conditioned arousal and sleep-related hyperarousal** – A second theory is the development of a classically conditioned response to the sleep environment such that the bed and bedroom are associated with anxiety, alertness, and arousal rather than with sleepiness or sleep onset ([figure 1](#)). Stimulus control therapy is used to "unlearn" the association between the sleep environment and sleeplessness. (See '[Stimulus control therapy](#)' below.)

BASELINE EVALUATION

Diagnostic confirmation — Insomnia disorder is a clinical diagnosis based on patient interview and history. The International Classification of Sleep Disorders, Third Edition, Text Revision (ICSD-3-TR) ([table 2](#)) [4] and the Diagnostic and Statistical Manual for Mental Disorders, Fifth Edition (DSM-5) [5] use similar diagnostic criteria for insomnia disorder. (See "[Evaluation and diagnosis of insomnia in adults](#)".)

Clinicians should establish that the patient meets diagnostic criteria for insomnia disorder and rule out other conditions that may have similar clinical presentations but a different underlying etiology, such as insufficient sleep, circadian rhythm sleep-wake phase disorders, sleep apnea, and other sleep disorders, in preparation for behavioral treatments. One of the key goals of the evaluation is to distinguish between insufficient sleep that results from behavioral factors (eg, watching television late at night, then rising early to commute to work), versus an inability to sleep despite having a sufficient opportunity to sleep ([table 3](#)). Insomnia must also be distinguished from delayed sleep phase and other circadian rhythm disorders. (See "[Evaluation and diagnosis of insomnia in adults](#)", section on '[Differential diagnosis](#)'.)

Patient eligibility and interest — Most patients who meet diagnostic criteria for insomnia disorder are appropriate for cognitive and behavioral interventions. CBT-I requires patients to be engaged with a multisession approach, and patients must be interested in a nonpharmacologic approach to their sleep problems.

While the number of mental health providers trained in the delivery of CBT-I continues to grow, an additional challenge is that some geographic regions still have few skilled providers able to deliver CBT-I [6]. In these situations, patients may benefit from self-guided treatments (eg, online, mobile applications, or printed). (See '[Alternative delivery modalities](#)' below.)

There is some evidence that patients prefer nonpharmacologic approaches, such as CBT-I, over medications; however, medications are still commonly used in clinical practice. Women and younger individuals tend to have even stronger preferences for behavioral treatments over pharmacologic treatments of psychiatric disorders in general [7].

In a study examining the acceptability of pharmacologic treatments and nonpharmacologic treatments of insomnia among women veterans, nonpharmacologic treatments of insomnia were rated as "very acceptable" significantly more often than pharmacologic treatments for insomnia [8]. Another study, which investigated preferences among hospitalized patients on a geriatric assessment unit, found that 82 percent of participants felt nondrug alternatives were healthier than medications in managing sleep difficulties [9]. This may indicate a potential mismatch between patient preference for treatment and treatments they are given within routine clinical care.

Precautions — There are a few clinical situations in which the use of CBT-I may be inappropriate, and precautions should be taken. In some cases, CBT-I can be modified to improve safety. These precautions are generally based on the potential adverse effects of short-term sleep time reduction that can result from implementation of sleep restriction therapy. These conditions include:

- Patients with poorly controlled seizure disorder
- Patients with untreated bipolar disorder who have a history of a manic and/or hypomanic episode or who have had manic symptoms triggered by sleep loss in the past
- Patients who have experienced an acute change in health status, such as an illness, accident, or surgery
- Patients who are excessively sleepy during the day (eg, due to severe, untreated sleep apnea)
- Patients who may experience increased occupational risks as a result of increased sleepiness, such as transportation industry workers or individuals in occupations that require sustained alertness

In most instances, CBT-I can be adapted for individuals who are not candidates for sleep restriction therapy by using other components of CBT-I to improve sleep quality (eg, sleep hygiene, sleep/wake schedule stabilization, cognitive therapy approaches). Sleep restriction therapy and stimulus control therapy can also be modified and used in some cases.

Helping patients access CBT-I — Since healthcare providers who deliver CBT-I typically have specialized training, it may be necessary to seek out these providers specifically. There are two main resources to consider:

- The Society for Behavioral Sleep Medicine (SBSM) lists providers who are members of the organization by geographic region within and outside of the United States and provides accreditation to training programs. Individuals who are Diplomates of the American Board of Behavioral Sleep Medicine are also listed on the [SBSM website](#).
- Accredited sleep disorders center through the American Academy of Sleep Medicine (AASM) are required to provide comprehensive care for insomnia disorder, either within the center or through referrals. Accredited centers can be searched by United States zip code on the [AASM website](#).

Some patients may be interested in self-directed app-based treatments. Two free options are:

- [Insomnia Coach](#), which is available through the Department of Veterans Affairs
- [CBT-I Coach](#), which is available to assist individuals who are engaged in CBT-I with a treating healthcare provider

COMPONENTS OF THERAPY

CBT-I is a multicomponent treatment that is comprised of behavioral and cognitive components.

Sleep education — CBT-I requires patients to engage in a number of behaviors that are counterintuitive, and treatment begins with education about insomnia and sleep. This education then provides a framework for recommendations associated with the cognitive and behavioral strategies that follow. Education components typically cover all of the following:

- The "3 P's" model of how insomnia develops (see '[Theoretical framework](#)' above)
- The two-process model of sleep regulation: sleep drive and circadian rhythms ([figure 2](#) [10] (see "[Overview of circadian sleep-wake rhythm disorders](#)", section on 'Functions of the

circadian system')

- Cognitive and physical arousal and the need for reducing arousal near bedtime

Sleep restriction therapy — Sleep restriction therapy is designed to address the maladaptive behavioral pattern adopted by many insomnia patients that leads to extended time in bed, and therefore, to extended periods of wakefulness during the night [11,12]. This approach is a recommended treatment for insomnia disorder [13,14] and is a multistep process carried out over multiple sessions.

During the treatment, the patient is asked to maintain a daily sleep diary (table 4 and table 5) that is used to calculate total sleep time and sleep efficiency (ie, the percent of time the patient is asleep out of the time they are in bed intending to sleep) [15]. The steps for implementation of sleep restriction therapy are shown in the table (table 6).

Sleep compression — Sleep compression is an alternative to sleep restriction therapy in patients with a contraindication to acute sleep loss, such as active bipolar disorder or poorly controlled epilepsy (see 'Precautions' above). Sleep compression is the inverse of sleep restriction therapy. The steps involved in sleep compression are shown in the table (table 7).

Stimulus control therapy — Stimulus control therapy is based on the theory of conditioned insomnia and is designed to help the patient relearn an association between the sleep environment and rapid sleep onset [16], and it is supported as a treatment for insomnia [14]. Stimulus control involves a set of instructions that are designed to eliminate situations in which the sleeper is in bed struggling with sleep and increase the frequency of falling asleep quickly in bed. Instructions for stimulus control are shown in the table (table 8).

Sleep hygiene — Sleep hygiene interventions involve targeting behavioral habits that negatively impact sleep. It is important to note that sleep hygiene alone is not considered an effective treatment for insomnia disorder, although this approach is typically incorporated into CBT-I [17,18].

Sleep hygiene can be implemented in a variety of ways; however, core principles address spending an appropriate amount of time in bed, dietary and substance use habits, and improving the sleep environment (table 9). Many of these recommendations are incorporated into other components of CBT-I (eg, having a regular rise time, avoiding naps) as part of sleep restriction and/or stimulus control approaches.

Cognitive therapy — Cognitive therapy involves identifying and addressing maladaptive thoughts that lead to negative emotions [19,20]. In the case of insomnia disorder, thoughts and

beliefs about sleep can increase arousal near bedtime and delay or prevent sleep. Thoughts and beliefs can also increase the likelihood of engaging in unhelpful behaviors such as extending time in bed to try to catch up on sleep based on the belief that "casting a wide net" will lead to fewer daytime symptoms.

Counter-arousal measures, including relaxation — Relaxation-based strategies were some of the earliest treatments used for insomnia disorder [21]. Two common approaches are progressive muscle relaxation (PMR) and diaphragmatic breathing. Relaxation therapies are commonly incorporated into CBT-I treatments as a way to reduce arousal near bedtime. Neither approach is typically used as a stand-alone therapy.

- **Progressive muscle relaxation** – PMR involves learning to elicit a physical relaxation response by tensing and relaxing different muscle groups in the body, focusing on a relaxed state. Patients are instructed to practice this skill regularly and obtain mastery before applying the skills at bedtime. (See "[Acute procedural anxiety and specific phobia of clinical procedures in adults: Treatment overview](#)".)
- **Diaphragmatic breathing** – Diaphragmatic breathing ([table 10](#)) is a technique for breathing that also elicits a relaxation response by balancing oxygen and carbon dioxide levels. Anxiety is associated with faster, shallow breathing, which increases oxygen levels in the blood in preparation for a "fight or flight" response. As with PMR, patients are instructed to practice diaphragmatic breathing before using it to facilitate relaxation in bed when attempting to sleep.
- **Mindfulness** – Mindfulness-based approaches have also been used to address arousal in insomnia patients. These approaches involve contact with the present moment and engagement with experiences and emotions. They are sometimes combined with behavioral techniques, such as stimulus control and sleep restriction, and sometimes used separately to treat insomnia [22]. In one trial, mindfulness-based cognitive therapy (MBCT) was superior a sleep education control for insomnia outcomes at two- and five-month follow-up, although these differences were not sustained at the eight-month follow-up visit [23].

SEQUENCING AND COMBINATION WITH MEDICATIONS

A preference for CBT-I or other behavioral therapies over medication as initial therapy has been endorsed in clinical practice guidelines of the American Academy of Sleep Medicine [24], the

British Association for Psychopharmacology [25], the American College of Physicians [26,27], and the European Sleep Research Society [28].

Hypothetically, combining CBT-I with medications is appealing, as medications may quickly improve sleep quality, while the full benefits of CBT-I may not be realized for several weeks. However, there is some evidence that the use of hypnotic medications can negatively impact outcomes of CBT-I [29], and medications do not appear to enhance treatment benefits of CBT-I alone [30].

When CBT-I is not sufficiently effective, clinical practice guidelines support the use of medications as an adjunctive treatment [26]. In such cases, patients and providers should discuss the risks and benefits of medications and develop a plan for monitoring potential adverse effects. (See "[Pharmacotherapy for insomnia in adults](#)".)

TREATMENT DURATION

CBT-I is a brief treatment, typically lasting four to eight sessions. A dose-response study showed that the greatest benefit was received with four or eight sessions as compared with one or two sessions [31]. There are other approaches that use brief interventions focused on the behavioral elements that may result in improvements in two to four sessions. (See '[Brief behavioral treatment approaches](#)' below.)

EFFICACY OF THERAPY

Traditional one-on-one delivery — There is moderate-quality evidence that multicomponent CBT-I results in clinically significant improvement in chronic insomnia in patients with [32,33] and without [34-37] comorbid medical and psychiatric disorders [38,39]. Improvement in insomnia symptoms typically occurs gradually over the course of CBT-I delivery, and the benefits tend to be durable beyond the end of treatment [39].

A 2021 meta-analysis by the American Academy of Sleep Medicine (AASM) included 49 randomized trials of CBT-I versus a control condition (eg, wait list, sleep hygiene education, placebo) in nearly 4000 patients with chronic insomnia [38]. In-person, one-on-one CBT-I was the most common delivery method (21 trials with a total of 1174 patients). Outcomes demonstrating improvements that exceeded clinical significance thresholds compared with control included:

- Insomnia remission rate (absolute difference 33 percentage points higher for CBT-I versus control)
- Treatment responder rate (45 percentage points higher for CBT-I versus control)
- Insomnia severity index scores (large effect size for the difference between CBT-I versus control)

Improvements in sleep latency (13 minutes shorter for CBT-I versus control), sleep quality (small to moderate effect size for the difference between CBT-I versus control), wake after sleep onset by sleep diary (19 minutes lower for CBT-I versus control), and total sleep time by sleep diary (9.7 minutes longer for CBT-I versus control) were statistically significant but did not meet clinical significance thresholds. The overall quality of the evidence was rated as moderate due to modest effect sizes on some critical outcomes (imprecision) and lack of blinding in some trials (risk of bias). A separate meta-analysis found moderate improvements in quality of life associated with CBT-I, particularly in patients without comorbid medical or psychiatric disorders [40].

Although traditionally delivered in person, CBT-I can also be delivered using a telemedicine format. In randomized noninferiority trials, insomnia outcomes are similar for face-to-face and telemedicine-delivered CBT-I, and the therapeutic alliance is maintained despite the remote format [41,42].

Alternative delivery modalities — There is also moderate-quality evidence to support the efficacy of CBT-I using alternative delivery methods such as group CBT-I [43], telephone-based CBT-I [44,45], and internet-based CBT-I [46-55]. These modalities may help to overcome some of the access, economic, and cultural barriers that exist for one-on-one CBT-I.

The 2021 AASM meta-analysis included data from 28 randomized trials of CBT-I using various alternative delivery methods versus a control condition in nearly 3000 adults with chronic insomnia [38]. Outcomes for each delivery method were not analyzed separately due to heterogeneity across the studies.

One critical access barrier to CBT-I is the availability of skilled providers, and alternative delivery modalities may increase access to individuals who are unable to receive care in a one-on-one format in their local area. As an example, one trial enrolled 1711 patients with self-reported insomnia (out of nearly 10,000 screened) and randomly assigned them to receive a six-session digital CBT-I program or a control condition (access to sleep hygiene education material on the study website) [54]. Approximately half of patients in the intervention arm completed all six sessions of digital CBT-I, and 20 percent did not complete any sessions. Compared with controls in an intent-to-treat analysis, patients assigned to CBT-I showed greater improvement in a

range of self-reported health outcomes, including small improvements in functional health and psychological well-being and larger gains in sleep-related quality of life and insomnia symptoms. However, specific sleep data were not reported.

Additional studies are needed to compare alternative delivery methods directly with face-to-face CBT-I [56]. In a small trial comparing face-to-face and clinician-guided online CBT-I with a wait-list control in 90 patients with insomnia, both delivery methods performed significantly better than the wait-list control, but face-to-face CBT-I was associated with larger treatment effects and better depression and anxiety outcomes than online delivery [57].

A caveat of the available literature is that the patient populations studied using alternative modalities differ in important ways, and there are different access barriers depending upon how treatment is offered. For example, telehealth or online programs may be desirable when travel to a treatment site is a barrier, but face-to-face sessions may be preferable when access to technology is a challenge, or when the patient has sensory impairments that make engagement with online content difficult (eg, visual or hearing impairment).

CBT-I to facilitate discontinuation of hypnotics — CBT-I is commonly used to address insomnia symptoms in patients who are attempting to discontinue sedative-hypnotic medication use. Treating the underlying insomnia can help decrease anticipatory anxiety and fear of rebound insomnia, which are common among patients attempting to stop medications [58,59].

Several small trials support the role of CBT-I in combination with hypnotic-taper interventions to improve the likelihood of a successful taper [60-62]. A systematic review identified eight such randomized trials in 482 adults [63]. CBT-I plus gradual medication taper improved the likelihood of hypnotic discontinuation at study completion compared with gradual taper alone (45 versus 27 percent; RR 1.68, 95% CI 1.19-2.39). Subjective sleep outcomes also improved more with CBT-I. Long-term (12-month) outcomes pooled from four trials were similar but did not reach statistical significance.

BRIEF BEHAVIORAL TREATMENT APPROACHES

There is a growing body of evidence to support the use of briefer, behaviorally-focused treatments for insomnia disorder (eg, brief behavioral treatment for insomnia [BBTI]) in adults [38,64-69]. These interventions are typically shorter in length compared with CBT-I and contain a subset of the behavioral components, such as stimulus control (☞ table 8), abbreviated sleep restriction therapy (☞ table 6), and sleep hygiene (☞ table 9).

Although supporting evidence is of lower quality compared with traditional CBT-I, BBTI is an acceptable alternative for patients who prefer the shorter format or when resources do not allow for CBT-I [38,39].

A variety of interventions delivered face-to-face or remotely by clinicians with varied levels of expertise have been studied. One method that may be clinically feasible and cost effective is to train nurses or advanced practice providers to deliver sleep restriction therapy as a behavioral approach. In an open-label randomized trial in England involving 642 adults with insomnia disorder recruited from 35 general practices, four sessions of nurse-delivered sleep restriction therapy improved patient-reported insomnia severity scores compared with a sleep hygiene booklet alone [69]. At six-month follow-up, 42 percent of patients in the treatment arm met criteria for a clinical treatment response, compared with 17 percent in the control group. Other smaller trials have shown similar benefits from other nurse-delivered BBTI approaches [64,65].

SOCIETY GUIDELINE LINKS

Links to society and government-sponsored guidelines from selected countries and regions around the world are provided separately. (See "[Society guideline links: Insomnia in adults](#)".)

INFORMATION FOR PATIENTS

UpToDate offers two types of patient education materials, "The Basics" and "Beyond the Basics." The Basics patient education pieces are written in plain language, at the 5th to 6th grade reading level, and they answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials. Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are written at the 10th to 12th grade reading level and are best for patients who want in-depth information and are comfortable with some medical jargon.

Here are the patient education articles that are relevant to this topic. We encourage you to print or e-mail these topics to your patients. (You can also locate patient education articles on a variety of subjects by searching on "patient info" and the keyword(s) of interest.)

- Basics topic (see "[Patient education: Insomnia \(The Basics\)](#)")
- Beyond the Basics topics (see "[Patient education: Insomnia \(Beyond the Basics\)](#)" and "[Patient education: Insomnia treatments \(Beyond the Basics\)](#)")

SUMMARY AND RECOMMENDATIONS

- **Overview** – Cognitive behavioral therapy for insomnia (CBT-I) is the mainstay of nonpharmacologic therapy for insomnia disorder and is preferred to medications as first-line therapy for chronic insomnia. (See "[Overview of the treatment of insomnia in adults](#)".)
- **Theoretical framework** – CBT-I aims to identify and target factors that sustain insomnia and correct maladaptive, conditioned arousal to the sleep environment. (See '[Theoretical framework](#)' above.)
- **Baseline evaluation** – Basic requirements for CBT-I include a clinical diagnosis of insomnia disorder ([table 2](#)) and a patient who is interested in a nonpharmacologic approach to their sleep problems. (See '[Baseline evaluation](#)' above.)

For the sleep restriction component of therapy, caution is required in patients with poorly controlled seizures or other comorbidities that would increase the potential for adverse effects of short-term sleep time reduction. (See '[Precautions](#)' above.)

- **Components of therapy** – CBT-I is a multicomponent treatment typically consisting of sleep education, sleep restriction therapy ([table 6](#)), sleep compression ([table 7](#)), stimulus control therapy ([table 8](#)), sleep hygiene ([table 9](#)), cognitive therapy, and counter-arousal measures, including relaxation ([table 10](#)). (See '[Components of therapy](#)' above.)
- **Treatment duration** – CBT-I is a brief treatment, typically lasting four to eight sessions. Even shorter behavioral approaches are an acceptable alternative for patients who prefer the shorter format or when resources do not allow for CBT-I. (See '[Treatment duration](#)' above and '[Brief behavioral treatment approaches](#)' above.)
- **Efficacy of therapy** – In randomized trials, multicomponent CBT-I results in clinically significant improvements in sleep outcomes and quality of life in patients with and without comorbid medical and psychiatric disorders. (See '[Traditional one-on-one delivery](#)' above.)

In addition to traditional face-to-face delivery, accumulating evidence supports alternative delivery methods such as group CBT-I, internet-based CBT-I, and brief behavioral treatments. (See '[Alternative delivery modalities](#)' above and '[Brief behavioral treatment approaches](#)' above.)

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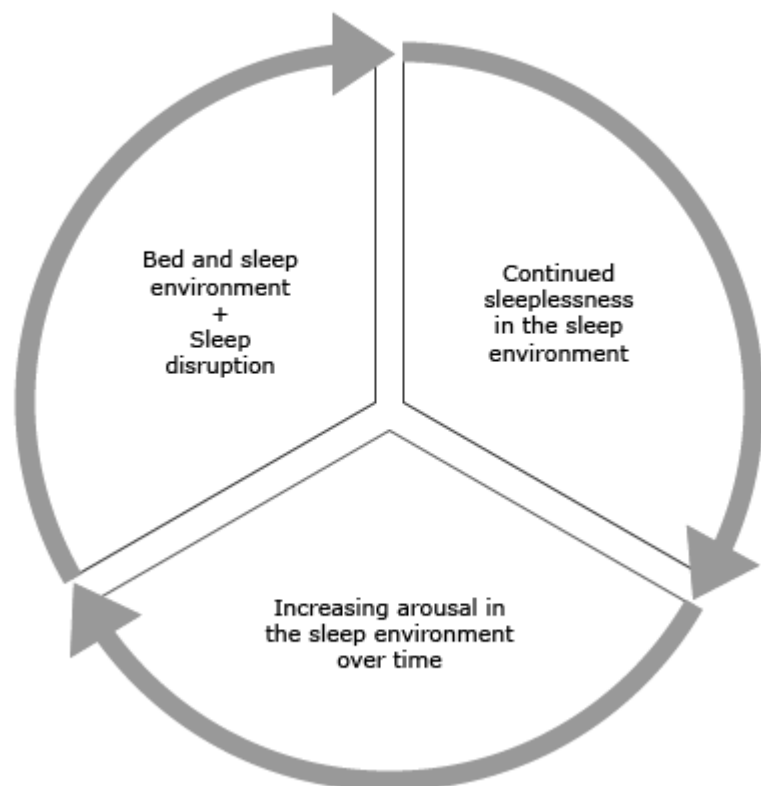
GRAPHICS

Examples of predisposing, precipitating, and perpetuating factors in insomnia

Predisposing factors	Precipitating events	Perpetuating factors
Factors that increase risk for insomnia disorder	Events that lead to sleep disruption	Behavioral and cognitive factors that sustain poor sleep over time
<ul style="list-style-type: none">▪ History of childhood or interpersonal trauma▪ Chronic mental health conditions, depression, or anxiety▪ History of shift work or erratic sleep-wake patterns▪ Chronic pain conditions	<ul style="list-style-type: none">▪ Severe accident leading to physical injury▪ Divorce or death of a spouse or close family member▪ Change in occupation such as loss of a job or transition to a new job	<ul style="list-style-type: none">▪ Watching television in bed while trying to fall asleep▪ Staying in bed for extended periods of time in an effort to obtain more sleep or taking long naps during the day▪ Anxiety and worry about sleep loss

Adapted from: Martin JL, Badr MS, Zeineddine S. Sleep Disorders in Women Veterans. Sleep Med Clin 2018; 13:433.

Cycle of conditioned arousal to the sleep environment



The pairing of the sleep environment with sleep disruption over time leads to increasing arousal in the sleep environment itself. This cycle then becomes self reinforced, and the strength of the association increases with repeated pairing of the sleep environment with sleeplessness.

International Classification of Sleep Disorders, third edition (ICSD-3) diagnostic criteria for chronic insomnia disorder

Diagnostic criteria A-F must be met:	
A	The patient reports, or the patient's parent or caregiver observes, one or more of the following: <ul style="list-style-type: none"> ▪ Difficulty initiating sleep* ▪ Difficulty maintaining sleep¶ ▪ Waking up earlier than desired^Δ ▪ Resistance to going to bed on appropriate schedule ▪ Difficulty sleeping without parent or caregiver intervention
B	The patient reports, or the patient's parent or caregiver observes, one or more of the following related to the nighttime sleep difficulty: <ul style="list-style-type: none"> ▪ Fatigue/malaise ▪ Attention, concentration, or memory impairment ▪ Impaired social, family, occupational, or academic performance ▪ Mood disturbance/irritability ▪ Daytime sleepiness ▪ Behavioral problems (eg, hyperactivity, impulsivity, aggression) ▪ Reduced motivation/energy/initiative ▪ Proneness to errors/accidents ▪ Concerns about or dissatisfaction with sleep
C	The reported sleep-wake complaints cannot be explained purely by inadequate opportunity (ie, enough time is allotted for sleep) or inadequate circumstances (ie, the environment is safe, dark, quiet, and comfortable) for sleep
D	The sleep disturbance and associated daytime symptoms occur at least three times per week
E	The sleep disturbance and associated daytime symptoms have been present for at least three months
F	The sleep/wake difficulty is not better explained by another sleep disorder

* In general, delays of >20 minutes for children and young adults and >30 minutes for middle-aged and older adults are considered clinically significant.

¶ In general, periods of awakening in the middle of the night of >20 minutes for children and young adults and >30 minutes for middle-aged and older adults are considered clinically significant.

Δ In general, waking up >30 minutes before normal awakening time is considered clinically significant.

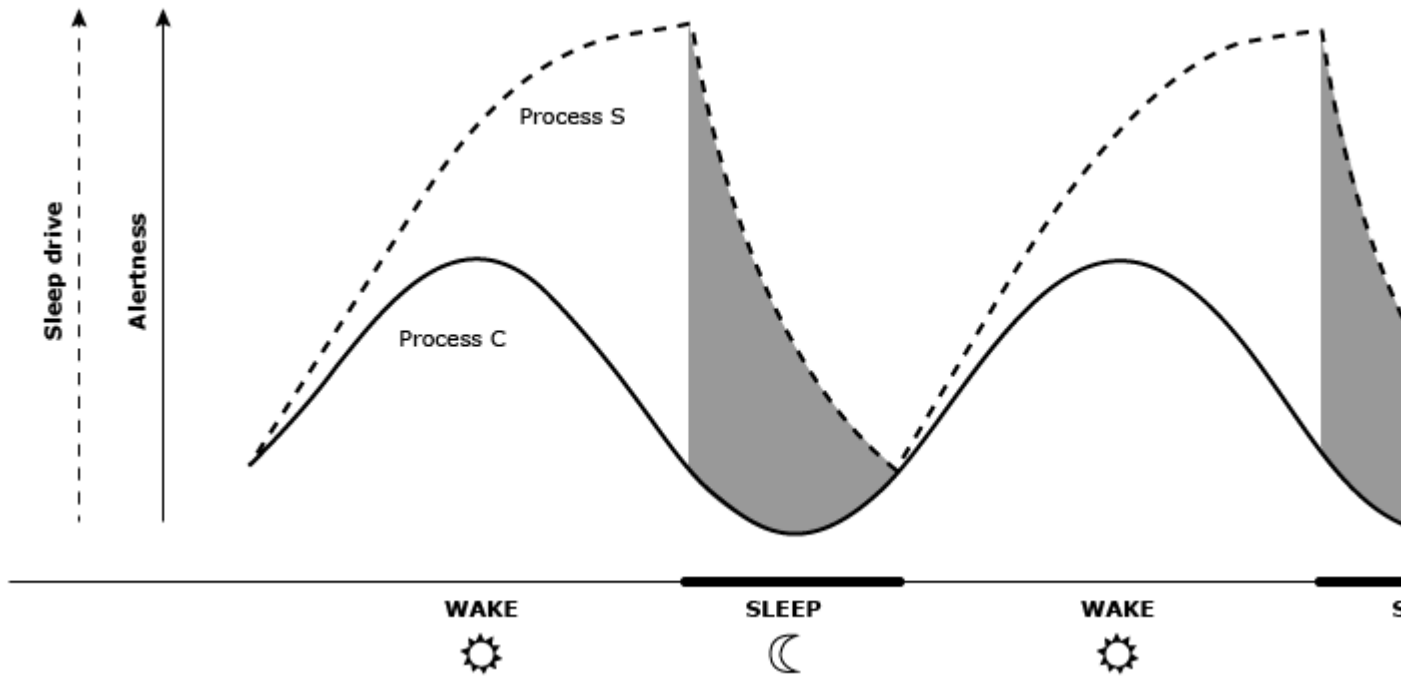
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Distinction between insufficient sleep and insomnia disorder

	Insufficient sleep/sleep deprivation	Insomnia disorder
Ability to sleep	Maintained. Patient is able to sleep when given the opportunity.	Disrupted. Patient cannot sleep even when an opportunity to obtain sufficient sleep is available.
Opportunity for sleep	Inadequate. Patient is not in bed long enough to obtain sufficient sleep, and, therefore, suffers daytime consequences.	Adequate. Patient is able to spend an adequate amount of time in bed to obtain sufficient sleep, but is not able to sleep when the opportunity is available.
Sleep duration	Short sleep duration due to inadequate opportunity.	Short sleep duration despite adequate opportunity.

Two-process model of sleep



Sleep drive (process S) increases with wakefulness and dissipates with sleep. The circadian signal (process C) rhythmically across day and night.

Consensus Sleep Diary

Today's date	4/5/11						
1. What time did you get into bed?	10:15 PM						
2. What time did you try to go to sleep?	11:30 PM						
3. How long did it take you to fall asleep?	55 min						
4. How many times did you wake up, not counting your final awakening?	6 times						
5. In total, how long did these awakenings last?	2 hours 5 min						
6a. What time was your final awakening?	6:35 AM						
6b. After your final awakening, how long did you spend in bed trying to sleep?	45 min						
6c. Did you wake up earlier than you planned?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
6d. If yes, how much earlier?	1 hour						
7. What time did you get out of bed for the day?	7:20 AM						
8. In total, how long did you sleep?	4 hours 10 min						
9. How would you rate the quality of your sleep?	<input type="checkbox"/> Very poor <input checked="" type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good	<input type="checkbox"/> Very poor <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Very good
10. How rested or refreshed did you feel when you woke up for the day?	<input type="checkbox"/> Not at all rested <input checked="" type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested	<input type="checkbox"/> Not at all rested <input type="checkbox"/> Slightly rested <input type="checkbox"/> Somewhat rested <input type="checkbox"/> Well-rested <input type="checkbox"/> Very well-rested
11a. How many times did you nap or doze?	2 times						
11b. In total, how long did you nap or doze?	1 hour 10 min						
12a. How many drinks containing alcohol did you have?	3 drinks						
12b. What time was your last drink?	9:20 PM						
13a. How many caffeinated drinks (coffee, tea, soda, energy drinks) did you have?	2 drinks						
13b. What time was your last drink?	9:20 PM						
14. Did you take any over-the-counter or prescription medication(s) to help you sleep? If so, list medication(s) dose, and time taken	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Relaxo-Herb Dose: 50 mg Time(s) taken: 11 PM	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:	<input type="checkbox"/> Yes <input type="checkbox"/> No Medication(s): Dose: Time(s) taken:
15. Comments (if applicable)	I have a cold						

Questions 1 through 10 are to be completed within one hour of getting out of bed in the morning. Question 15 are to be completed before bed.

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Graphic 87134 Version 7.0

Consensus Sleep Diary instructions

General instructions

What is a sleep diary?

A sleep diary is designed to gather information about your daily sleep pattern.

How often and when do I fill out the sleep diary?

It is necessary for you to complete your sleep diary every day. If possible, the sleep diary should be completed within one hour of getting out of bed in the morning.

What should I do if I miss a day?

If you forget to fill in the diary or are unable to finish it, leave the diary blank for that day.

What if something unusual affects my sleep or how I feel in the daytime?

If your sleep or daytime functioning is affected by some unusual event (such as an illness or an emergency), you may make brief notes on your diary.

What do the words "bed" and "day" mean on the diary?

This diary can be used for people who are awake or asleep at unusual times. In the sleep diary, the word "day" is the time when you choose or are required to be awake. The term "bed" means the place where you usually sleep.

Will answering these questions about my sleep keep me awake?

This is not usually a problem. You should not worry about giving exact times, and you should not watch the clock. Just give your best estimate.

Sleep diary item instructions

Use the guide below to clarify what is being asked for each item of the sleep diary.

Date: Write the date of the morning you are filling out the diary.

1. What time did you get into bed?

Write the time that you got into bed. This may not be the time you began "trying" to fall asleep.

2. What time did you try to go to sleep?

Record the time that you began "trying" to fall asleep.

3. How long did it take you to fall asleep?

Beginning at the time you wrote in question 2, how long did it take you to fall asleep?

4. How many times did you wake up, not counting your final awakening?

How many times did you wake up between the time you first fell asleep and your final awakening?

5. In total, how long did these awakenings last?

What was the total time you were awake between the time you first fell asleep and your final awakening? For example, if you woke 3 times for 20 minutes, 35 minutes, and 15 minutes, add

them all up (20 + 35 + 15 = 70 minutes or 1 hour and 10 minutes).

6a. What time was your final awakening?

Record the last time you woke up in the morning.

6b. After your final awakening, how long did you spend in bed trying to sleep?

After the last time you woke up (item #6a), how many minutes did you spend in bed trying to sleep? For example, if you woke up at 8:00 AM but continued to try and sleep until 9:00 AM, record 1 hour.

6c. Did you wake up earlier than you planned?

If you woke up or were awakened earlier than you planned, check yes. If you woke up at your planned time, check no.

6d. If yes, how much earlier?

If you answered "yes" to question 6c, write the number of minutes you woke up earlier than you had planned on waking up. For example, if you woke up 15 minutes before the alarm went off, record 15 minutes here.

7. What time did you get out of bed for the day?

What time did you get out of bed with no further attempt at sleeping? This may be different from your final awakening time (eg, you may have woken up at 6:35 AM but did not get out of bed to start your day until 7:20 AM).

8. In total, how long did you sleep?

This should just be your best estimate, based on when you went to bed and woke up, how long it took you to fall asleep, and how long you were awake. You do not need to calculate this by adding and subtracting; just give your best estimate.

9. How would you rate the quality of your sleep?

"Sleep quality" is your sense of whether your sleep was good or poor.

10. How restful or refreshed did you feel when you woke up for the day?

This refers to how you felt after you were done sleeping for the night, during the first few minutes that you were awake.

11a. How many times did you nap or doze?

A nap is a time you decided to sleep during the day, whether in bed or not in bed. "Dozing" is a time you may have nodded off for a few minutes, without meaning to, such as while watching TV. Count all the times you napped or dozed at any time from when you first got out of bed in the morning until you got into bed again at night.

11b. In total, how long did you nap or doze?

Estimate the total amount of time you spent napping or dozing, in hours and minutes. For instance, if you napped twice, once for 30 minutes and once for 60 minutes, and dozed for 10 minutes, you would answer "1 hour 40 minutes." If you did not nap or doze, write "N/A" (not applicable).

12a. How many drinks containing alcohol did you have?

Enter the number of alcoholic drinks you had where 1 drink is defined as one 12 oz beer (can), 5 oz wine, or 1.5 oz liquor (one shot).

12b. What time was your last drink?

If you had an alcoholic drink yesterday, enter the time of day in hours and minutes of your last drink. If you did not have a drink, write "N/A" (not applicable).

13a. How many caffeinated drinks (coffee, tea, soda, energy drinks) did you have?

Enter the number of caffeinated drinks (coffee, tea, soda, energy drinks) you had where for coffee and tea, one drink = 6 to 8 oz, while for caffeinated soda one drink = 12 oz.

13b. What time was your last caffeinated drink?

If you had a caffeinated drink, enter the time of day in hours and minutes of your last drink. If you did not have a caffeinated drink, write "N/A" (not applicable).

14. Did you take any over-the-counter or prescription medication(s) to help you sleep?

If so, list medication(s), dose, and time taken: List the medication name, how much and when you took EACH different medication you took tonight to help you sleep. Include medication available over the counter, prescription medications, and herbals (example: "Sleepwell 50 mg 11:00 PM"). If every night is the same, write "same" after the first day.

15. Comments:

If you have anything that you would like to say that is relevant to your sleep, feel free to write it here.

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Sleep restriction therapy for chronic insomnia (conducted over multiple visits)*

Step 1:	Patient maintains a daily sleep diary for 1 to 2 weeks. Average total sleep time and sleep efficiency are computed from the information on the sleep diary [¶] .
Step 2:	If sleep efficiency is below 85%, the time in bed window (ie, elapsed time from bedtime to rise time) is set to equal the number of hours of sleep based on the sleep diary but not less than 6 hours, with a consistent bedtime and rise time each day. The patient is instructed not to nap during the day. The patient continues to keep a sleep diary until the next visit.
Step 3:	Average total sleep time and sleep efficiency are computed from the information on the sleep diary, and one of the following steps is taken: <ul style="list-style-type: none">A. If sleep efficiency is >90% and the patient does not feel sufficiently rested, the time in bed window is increased, typically by 15 minutes.B. If sleep efficiency is between 85 to 90%, the sleep schedule is maintained.C. If sleep efficiency is <85% and the patient does not feel sleepy, the time in bed window is shortened by 15 minutes. The patient continues to keep a sleep diary until the next visit.
Step 4:	Step 3 is repeated until sleep quality is satisfactory (refer to step 3A above) and the patient feels sufficiently rested during the day.

* Sleep restriction therapy is also sometimes referred to as "time in bed restriction" or "sleep efficiency training."

¶ Sleep efficiency is the time asleep divided by time in bed × 100.

Sleep compression therapy for chronic insomnia (conducted over multiple visits)

Step 1:	Patient maintains a daily sleep diary for 1 to 2 weeks. Average total sleep time and sleep efficiency are computed from the information on the sleep diary [*] .
Step 2:	<p>The time in bed window is set to match the average time in bed period calculated from the sleep diary, with a consistent bedtime and rise time each day.</p> <p>The patient is instructed not to nap during the day or to reduce nap duration to the extent possible.</p> <p>The patient continues to keep a sleep diary until the next visit.</p>
Step 3:	<p>The time in bed window is reduced by 30 minutes until sleep efficiency is >85%. If the patient does not feel sufficiently rested, the time in bed window is maintained.</p> <p>The patient continues to keep a sleep diary until the next visit.</p>
Step 4:	Step 3 is repeated until sleep efficiency is above 85% and the patient is sleeping well and feels sufficiently rested.

* Sleep efficiency is the time asleep divided by time in bed x 100.

Stimulus control instructions for chronic insomnia

- | |
|---|
| 1. Go to bed only when sleepy. |
| 2. Use the bed and bedroom only for sleep (and sex). |
| 3. If you are in bed and unable to sleep, get out of bed and return only when sleepy. Typically, this is within 20 minutes. |
| 4. Get up at the same time in the morning regardless of how much sleep was obtained. |
| 5. Do not nap during the day. |

Graphic 122803 Version 1.0

Sleep hygiene guidelines

Recommendation	Details
Regular bedtime and rise time	Having a consistent bedtime and rise time leads to more regular sleep schedules and avoids periods of sleep deprivation or periods of extended wakefulness during the night.
Avoid napping	Avoid napping, especially naps lasting longer than 1 hour and naps late in the day.
Limit caffeine	Avoid caffeine after lunch. The time between lunch and bedtime represents approximately 2 half-lives for caffeine, and this time window allows for most caffeine to be metabolized before bedtime.
Limit alcohol	Recommendations are typically focused on avoiding alcohol near bedtime. Alcohol is initially sedating, but activating as it is metabolized. Alcohol also negatively impacts sleep architecture.
Avoid nicotine	Nicotine is a stimulant and should be avoided near bedtime and at night.
Exercise	Daytime physical activity is encouraged, in particular, 4 to 6 hours before bedtime, as this may facilitate sleep onset. Rigorous exercise within 2 hours of bedtime is discouraged.
Keep the sleep environment quiet and dark	<p>Noise and light exposure during the night can disrupt sleep. White noise or ear plugs are often recommended to reduce noise. Using blackout shades or an eye mask is commonly recommended to reduce light.</p> <p>This may also include avoiding exposure to television or technology near bedtime, as this can have an impact on circadian rhythms by shifting sleep timing later.</p>
Bedroom clock	Avoid checking the time at night. This includes alarm clocks and other time pieces (eg, watches and smart phones). Checking the time increases cognitive arousal and prolongs wakefulness.
Evening eating	Avoid a large meal close to bedtime. Eat a healthy and filling (but not too heavy) meal in the early evening and avoid late-night snacks.

Breathing with your diaphragm

NOTE: Before using this type of breathing to help with sleep, practice it daily until it becomes easy to get into a relaxed state. It might help to write down each time you practice, so you can keep track.

- Wear comfortable clothing.
- Sit in a comfortable chair with both feet on the floor.
- Place one hand at the top of your chest and the other on your belly with your little finger about 1 inch above your belly button.
- Breathe slowly through your nose using **only** your diaphragm. Try not to use your chest muscles at all. When you are doing this correctly:
 - Your belly should swell out as you breathe in, and fall back in as you breathe out.
 - Only your lower hand (on your belly) should move.
- Once you are breathing only with your diaphragm, start counting your breaths:
 - Count each time you breathe in, then think the word "out" as you breathe out (think "1, out," "2, out," "3, out...").
 - Do this for a total of 10 breaths counting forward from 1 to 10. Then do another 10 breaths counting backward from 10 to 1.
- Breathe at your own pace. Try not to breathe faster or slower than normal. Concentrate on using only your diaphragm.
- When you are done counting breaths, let your hands rest in your lap or at your side for a minute while you breathe normally. Then get up slowly.

Relaxation practice log:

Date	Time	Notes

Contributor Disclosures

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