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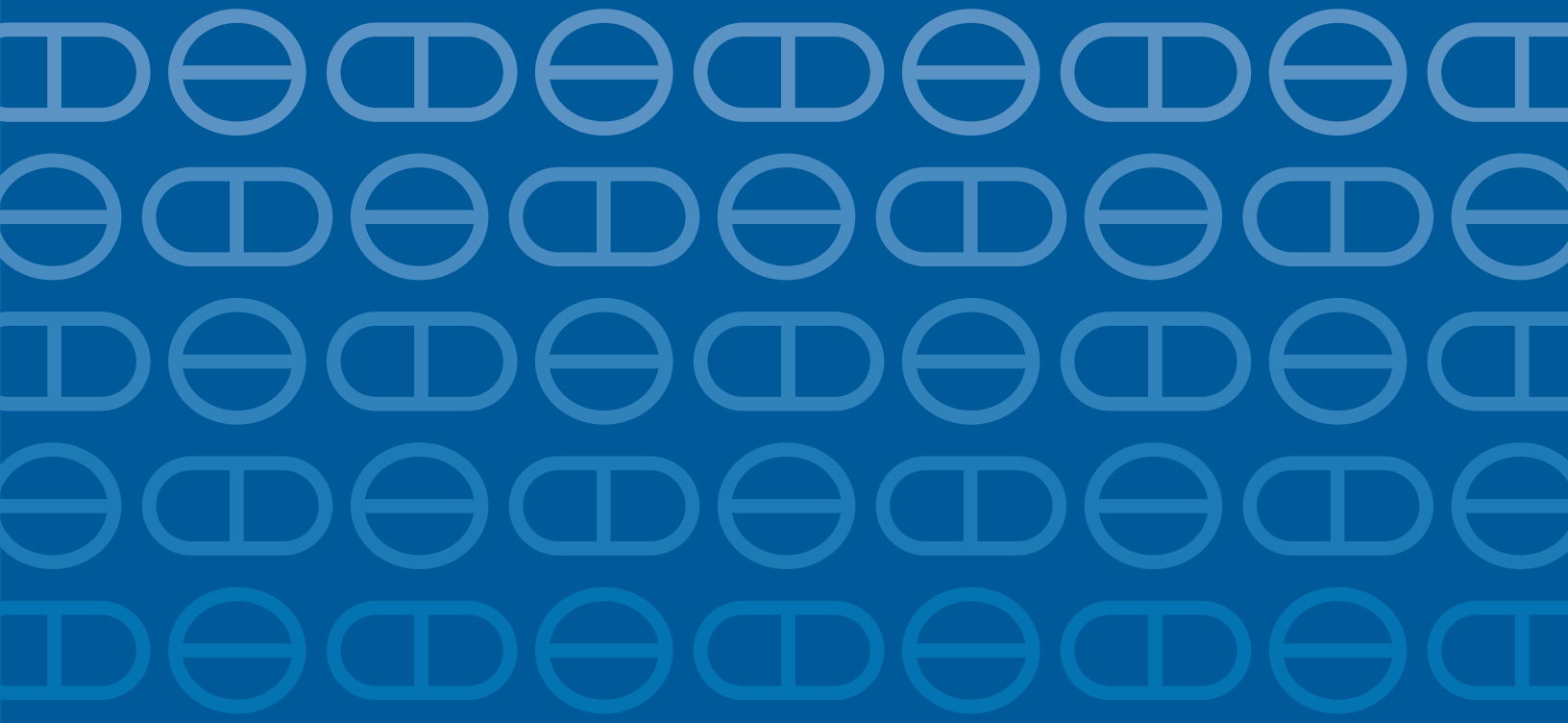
Managing insomnia in older adults

Evidence-based strategies to improve treatment and reduce benzodiazepine use



Managing insomnia in older adults

Evidence-based strategies to improve treatment and reduce benzodiazepine use

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Alosa Health

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Activity Overview:

The primary goal of this educational program is to address the challenge of effectively managing insomnia in older adults, with an emphasis on reducing the use of benzodiazepine and benzodiazepine-like medications when possible and appropriate. It reviews fundamental aspects of sleep architecture and the myriad ways normal sleep can be disrupted. The varied physical and mental roots of insomnia are covered, and the full range of pharmacologic and non-pharmacologic treatment options will be reviewed. The latest evidence-based recommendations for the use of benzodiazepine and benzodiazepine-like medications will be presented, along with practical strategies for safely reducing the use of these problematic medications in older adults.

The educational program includes a written evidence report (print monograph) and several non-CME/CE components:

- The written evidence report (print monograph)
- Summary document of top 4-5 key messages
- “Academic detailing” educational sessions in clinicians’ offices with trained outreach educators (pharmacists, nurses, physicians) who present the material interactively
- Reference cards for easy access to key materials
- Patient education information (brochure/tear off sheets)

The program’s goal is to critically review and synthesize the most current clinical information on these topics into accessible, non-commercial, evidence-based educational material, to be taught interactively to providers by specially trained clinical educators.

Target Audience:

The educational program is designed for primary care physicians practicing internal medicine, primary care, family practice, and geriatrics, and other health care professionals who deliver primary care.

Learning Objectives:

After completing this activity, participants will be able to:

- Describe how sleep patterns change with age
- Assess for treatable causes of sleep problems
- Use cognitive behavioral therapy for insomnia (CBT-I) as first-line treatment for patients with chronic insomnia
- Select a medication for insomnia based on the safety profile in older adults
- Review the risks of long-term medications for insomnia, particularly when prescribing benzodiazepines and benzodiazepine receptor agonists (Z-drugs) for older patients
- Discuss tapering and discontinuing benzodiazepines or Z-drugs whenever the risks outweigh the benefits of treatment

Disclosure Policy:

All individuals in a position to control the content of this activity have been asked to disclose any relationship they have with ineligible companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients. All relevant financial relationships have been mitigated.

This material is provided by Alosa Health, a nonprofit organization which accepts no funding from any pharmaceutical company. No commercial support has been received for this activity. The Independent Drug Information Service (IDIS) is supported by the PACE Program of the Department of Aging of the Commonwealth of Pennsylvania.

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Media used:

Printed educational material.

Instructions for Participation and Credit:

There are no fees to participate in this activity. To receive credit, participants must (1) read the statements on target audience, learning objectives, and disclosures, (2) study the educational activity, and (3) complete the post−test and activity evaluation. To receive *AMA PRA Category 1 Credit*™, ANCC contact hours, or Continuing Pharmacy Education (CPE) participants must receive a minimum score of 70% on the post−test.

Tests should be submitted to Alosa Health via email, mail or fax; to complete the evaluation and claim your certificate visit myce.hms.harvard.edu. Credits for pharmacists will be uploaded into CPE Monitor® within 60 days from the date the learner completed the activity.

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The activity will take approximately 1.00 hour to complete.

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Please email any questions to **cme@alosahealth.org** or call **(617) 948-5997.**

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Introduction

Life in 21st-century industrialized societies is filled with an array of stimuli and conditions that can, to one degree or another, disrupt or impair the circadian sleep cycles and sleep patterns that evolved over millions of years in vastly different environmental contexts.[1] In anthropological studies approximately 2% of members of hunter-gatherer tribes in Namibia (N=27) and Bolivia (N=45) reported symptoms of chronic insomnia[2], compared with rates ranging from 10% to 30% in industrial societies.[3] Sleep-disrupting aspects of contemporary life include the use of physiologically stimulating prescription or non-prescription substances (including caffeine[4]), work-related stress,[5] shift-work employment,[6] the evening use of short-wavelength-light producing electronic devices,[7,8] non-natural patterns of temperature and light cycles,[3] substance use disorders,[9] chronic medical conditions,[10] and anxiety and mood disorders.[11] Bi-directionality of causation can be involved in some of these factors, but this does not negate the significant role that these and many other forces have on the common appearance in primary care of patients presenting with complaints of insomnia. Indeed, the complexity and diversity of factors related to insomnia make this condition one of the more challenging for primary care clinicians to accurately diagnose and effectively treat, particularly in older adults.[12]

Although non-pharmacological treatments for insomnia, particularly cognitive behavioral therapy for insomnia (CBT-I), are effective and widely recommended as first-line approaches, such treatments remain under-used and pharmacological treatment with benzodiazepine and benzodiazepine-like medications is common.[13] The percentage of ambulatory visits by people with a benzodiazepine on their medication list grew, in a study of 386,457 U.S. outpatient visits, from 3.8% in 2003 to 7.4% in 2015.[14] A national survey of drug use in 2022 showed that 11.6% of adults ≥65 years used a benzodiazepine in the past year, and 0.5% reported misuse of a benzodiazepine in the past year.[15] Deaths related to benzodiazepine overdose have increased recently as well: a 42.9% rise from 2019 to 2020, which includes a 21.8% increase related to prescribed benzodiazepines (from 921 to 1,122 per 100,000 emergency department [ED] visits) and a 519% increase related to use of benzodiazepines other than as prescribed (from 51 to 316 per 100,000 ED visits).[16]

In addition to the risk of overdose, benzodiazepines pose significant risks, particularly in older adults, including cognitive deficits, falls, physiologic dependence, and higher mortality.[17] Prescriptions for benzodiazepine receptor agonists (also known as Z-drugs) have increased in recent years and are also associated with a similar range of adverse effects, including higher mortality.[18-20] Ironically, many primary care clinicians express dissatisfaction with available pharmacological options and favor reducing the use of benzodiazepines, Z-drugs, and other sleep medications.[21]

This evidence document discusses the management of insomnia in older adults, with a detailed look at chronic insomnia and ways it can be effectively treated in the primary care setting while minimizing potential harms related to the use of certain classes of medications commonly used to treat insomnia.

Insomnia definition and epidemiology

Insomnia is defined as a persistent difficulty with sleep initiation, duration, or quality despite adequate sleep opportunity that results in a related daytime consequence or concern.[22] Patients may present with a wide range of symptoms including: difficulty falling asleep at bedtime, waking at night and having difficulty going back to sleep, or waking too early and being unable to get back to sleep.

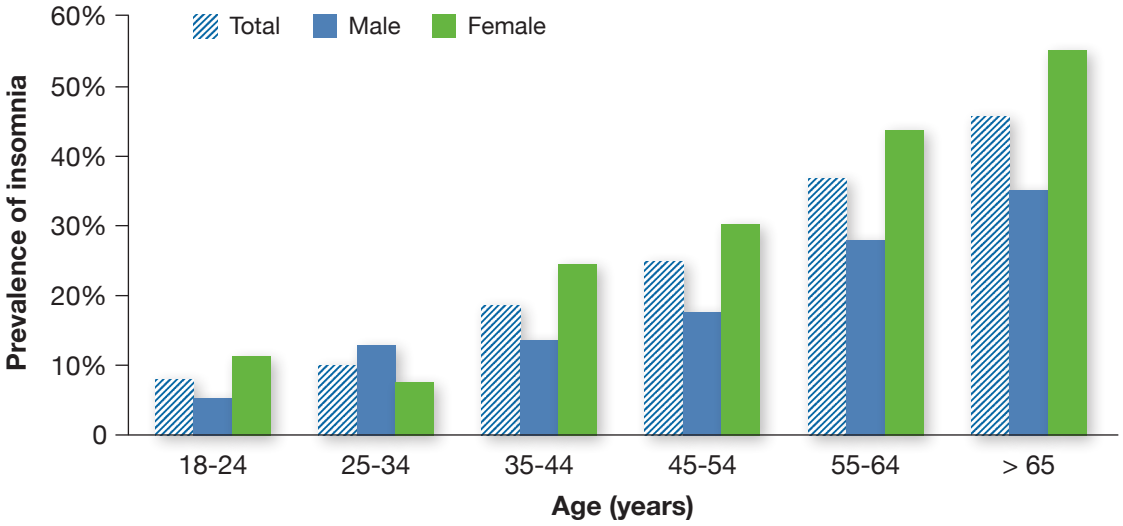
Reported sleep problems may overlap or be experienced differently over time. The presence of daytime symptoms that trouble the patient such as tiredness, problems with attention or memory, or disturbed mood are key components of insomnia.

In the past, a distinction was drawn between "primary" insomnia and insomnia secondary to a psychiatric, medical, or other type of sleep disorder. The most recent revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), however, omits this distinction because of the recognized difficulty of determining cause from effect in many cases of insomnia.[10] Insomnia can be a symptom of another disorder, but it may also precipitate or be a risk factor for new-onset psychiatric disorders.[23]

Insomnia prevalence varies across studies due to differences in definitions, sample populations, and reporting procedures. Rates from 5% to 50% have been reported, with prevalence generally higher in women than men.[10] For example, in a cross-sectional study in 6,961 household residents aged ≥60 years, the overall prevalence of "disturbed sleep" was 33.7%, with the condition being more prevalent in women (37.2%) than in men (27.4%).[24]

When more strict diagnostic criteria are used, prevalence rates range from 6% to 10%.[10] Prevalence tends to increase with age. For example, a study of 1,005 adults in Greece found increasing prevalence of insomnia with age, with women having higher levels in every age group except adults aged 25-34.[25]

Figure 1. Insomnia prevalence with age and gender[25]



Complaints about sleep are relatively common in older adults. A multi-center study of 9,282 participants ≥65 years old assessed rates of five sleep complaints: trouble falling asleep, waking up, awaking too early, needing to nap, and not feeling rested.[26] More than 50% of participants said they experienced at least one sleep complaint. Insomnia in this study was defined as reporting trouble falling asleep and/or waking up too early and not being able to fall asleep again "most of the time." Using this definition, between 23% and 34% had symptoms of insomnia. Between 7% and 15% percent said they rarely or never felt rested after waking up in the morning.

Although common in older adults, insomnia and other sleep difficulties are not universal and should not be dismissed as normal changes from aging. Many sleep problems arise from aspects of poor health that,

when corrected, can lead to resolution of the sleep issues. This was demonstrated in a 3-year epidemiologic study of 6,899 adults age ≥65 years with insomnia.[27] In this study using older data, 7% of those reporting insomnia occurred in the absence of associated medical, psychological, or behavioral risk factors. Of the nearly 2,000 participants with chronic insomnia (symptoms ≥3 days a week for ≥3 months) at baseline, almost half no longer reported symptoms on follow-up, and these participants reported improved health, suggesting that resolution of underlying problems can lead to resolution of insomnia symptoms.

The prevalence of insomnia, as well as racial disparities in self-reported trouble sleeping, may be increasing with time, though more research is needed.[28,29] The age-adjusted prevalence of insomnia in the U.S. increased from 17.4% in 2007 to 18.8% in 2012, with the largest relative increase among people aged 25-34 years (49% increase).[30]

Impacts of insomnia

In the short term, insomnia is associated with:[10]

- fatigue/tiredness
- hypersensitivity to noise and light
- low energy/motivation
- irritability
- heightened emotional reactiveness
- reduced optimism and self-esteem

Across longer time frames, insomnia has been linked to the following mental and physical conditions:[31]

- anxiety disorders
- depressive disorders
- suicidality
- hypertension
- type 2 diabetes
- impaired immune functioning
- migraine and tension-type headache
- cardiac events including myocardial infarction and coronary heart disease

Although this evidence document focuses on older adults, it is worth pointing out that insomnia is also associated with issues typically more relevant in younger adults such as absenteeism,[32] lost work productivity,[33] and occupational accidents.[34]

BOTTOM LINE: Insomnia is a very common concern of patients seen in primary care and can arise from a wide range of sleep-disrupting features of contemporary life. Insomnia prevalence increases with age and is generally more prevalent in women. Insomnia is associated with a host mental and physical conditions or concerns. Successful treatment of insomnia may resolve troublesome or harmful conditions and, conversely, successful treatment of some physical or emotional problems may help resolve insomnia.

Sleep architecture in older adults

Normal sleep architecture consists of transitions between four kinds of sleep: stage 1 (light, or transitional sleep characterized by alpha waves on electroencephalogram [EEG] recordings); stage 2 (comprising approximately half of sleep time and characterized by spindles and/or K-complexes on EEG); stage 3 (deep sleep characterized by theta waves); and Rapid Eye Movement (REM) sleep (dreaming sleep with EEG patterns similar to waking).[35] REM sleep is generally more prominent in the second half of the night or total sleep period.

Aging is associated with changes in the timing, duration, and quality of sleep. In general, older adults fall asleep faster but sleep less and have more frequent awakenings throughout the night, compared to younger adults. Other changes are summarized in Table 1.

Table 1. Changes in sleep with aging[35]

Measurement	Definition	Normal range	Change with age
Sleep latency	Time from lights out to sleep onset	<20 minutes	Unchanged or reduced
Total sleep time	Total time asleep	7-9 hours	Reduced
Sleep efficiency	Proportion of time in bed asleep	>85%	Reduced
Wake after sleep onset	Time spent awake in bed after initially falling asleep	<15% of time in bed	Increased

The National Sleep Foundation, in a review of available evidence, made the following recommendations for sleep duration, which follow a pattern of decreased need for sleep with advancing age: 14-17 hours for newborns, 12-15 hours for infants, 11-14 hours for toddlers, 9-11 hours for school-aged children, and 8-10 hours for teenagers, and 7-9 hours for adults aged ≥18 years.[36]

Assessing sleep problems

Routine screening for sleep complaints may not be common among primary care clinicians. One study involving 101 patients found that only 20% of the encounters involved screening for insomnia.[37] Screening for sleep problems can be as simple as asking “Are you having any problems with sleep?” or the use of some variation on Item 3 of the Patient Health Questionnaire-9, which asks if the patient has had “trouble falling or staying asleep, or sleeping too much.”[38] A more complete assessment can be obtained by using the Insomnia Severity Index (ISI).[39] The components of an effective sleep history include not only questions about sleep itself, but a full medical history, a social history (e.g., employment, substance use), and a psychiatric assessment.[40]

When a patient reports a problem with sleep, the following domains should be evaluated:[38]

- nature of the problem (i.e., trouble with sleep-onset, sleep-maintenance, or both)
- frequency of the problem (i.e., nightly vs. sporadic)
- chronicity of the problem (i.e., days, weeks, months, years)
- patient’s sleep schedule and habits (i.e., sleep opportunity and hygiene)

When discussing a patient's typical sleep schedule ask about potentially significant characteristics and factors such as:

- length of time it takes to fall asleep
- number of awakenings each night
- presence of nocturia
- timing and duration of naps
- variability in schedules (e.g., over weekends or due to shift work)
- pre-bedtime routine (e.g., use of electronic screens, exercise, food intake)
- qualities of the bedroom (e.g., temperature, amount of natural light)
- use of caffeine, alcohol, cannabis, nicotine or other substances potentially related to sleep disturbance
- use of non-prescription sleep aids
- attitude toward sleep (e.g., anxiety/frustration about sleeping or anticipated insomnia)
- recent travel across time zones
- presence of sleepwalking or other abnormal behaviors during sleep

The differential diagnosis for insomnia includes the following, which should be explored in patients who either present with sleep difficulties or respond positively to a broad screening question such as the one suggested above:[41]

- mental health conditions (e.g., depression, anxiety, post-traumatic stress disorder)
- medical conditions affecting sleep (e.g., heart failure, arthritis, chronic pain, gastro-esophageal reflux, nocturia, pregnancy, menopause)
- timing of certain medications (e.g., diuretics or stimulants too late in the day)
- other sleep disorder (e.g., sleep apnea, circadian rhythm disorder, restless leg syndrome)
- substance use disorder (e.g., alcohol, cocaine, opioids, amphetamines)

Diagnosing insomnia using the most recent American Academy of Sleep Medicine (AASM) criteria requires the presence of each of the following three major criteria, with the duration of symptoms determining whether the insomnia is acute (i.e., <3 months) or chronic (i.e., ≥3 days per week for ≥3 months):[22]

- **The patient or caregiver reports difficulty related to initiating or maintain sleep as desired including:**
  - difficulty initiating or maintaining sleep
  - waking up earlier than desired
  - resistance to going to bed on an appropriate schedule
  - difficulty sleeping without caregiver attention
- **The patient or caregiver reports a daytime consequence or concern related to nighttime sleep difficulty such as:**
  - fatigue/malaise
  - attention, concentration, or memory impairment
  - impaired social, family, occupational, or academic performance
  - mood disturbance/irritability
  - daytime sleepiness
  - behavioral problems
  - reduced motivation/energy/initiative

  - proneness for errors/accidents
  - concerns about or dissatisfaction with sleep
- **The reported sleep/wake complaints cannot be explained by a plausible alternative such as from:**
  - inadequate sleep opportunity (i.e., not enough time allotted for sleep)
  - inadequate circumstances (i.e., sleep environment is not conducive to sleep)
  - another sleep-related disorder (e.g., anything listed in the differential diagnosis above, such as circadian rhythm disorder or sleep apnea)
  - shift work
  - environmental factors
  - homelessness

Affirmative or positive findings on general assessments of presenting sleep difficulties may warrant further explorations, either by a primary care clinician or via referral to a sleep specialist or mental health provider. Assessment tools and techniques that may be used to provide more data on a patient's sleep disorder include sleep diaries, actigraphy and/or wearable technologies to assess movement during sleep; polysomnography (PSG), home sleep testing (HST), and formal questionnaires.

Sleep diaries allow patients to record details of their sleep and sleep-related variables over time (typically a week or two). Paper or electronic diaries are relatively low-cost, simple to use, and were shown in a study with 50 insomnia patients to have high sensitivity and specificity for insomnia symptoms compared to polysomnography (92.3% and 95.6% respectively).[42] Results from a study of 53 college students in Brazil showed that 7 days of diary use was sufficient for a reliable assessment of sleep time.[43] One way to evaluate data from sleep diaries is with sleep efficiency (SE), which is the ratio of total sleep time to the time spent in bed. In healthy adults, SE is typically around 85%.[35] A free, printable version of a 2-week sleep diary is available from sleepeducation.org.

Actigraphy uses wearable devices incorporating an accelerometer to measure sleep-wake cycles over multiple days and nights. Although not routinely indicated for diagnosing insomnia, actigraphy can augment sleep diary data, although the devices may also overestimate sleep duration.[44] Actigraphy may be useful for patients who believe they do not sleep at all (sleep-state misperception) and to differentiate between insomnia (which is characterized by high night-to-night variability in actigraphy-measured motion) and circadian rhythm disorders (which show shifting trends in activity distinct from those seen with insomnia).[45] Wearable, over-the-counter sleep trackers (e.g., smartwatches, wristbands, rings) are increasingly popular, and data they provide might augment a clinician's other assessment methods, but, to date, high-quality data have not confirmed the validity, accuracy, and reliability of these devices.[46] In a study comparing a range of wearable devices to polysomnography, the devices were shown to be relatively accurate for determining a simple measure of whether a user was asleep, but the devices were not useful for the assessment of specific sleep stages (compared to polysomnography).[47]

Polysomnography is the gold standard for objective sleep assessment, but it cannot distinguish patients with insomnia from those without it, hence it is not indicated for an assessment of insomnia unless some other sleep-related problem is suspected (e.g., REM sleep behavior disorder, periodic limb movement disorder, or sleep apnea).[48] Home sleep tests, which measure such variables as airflow, respiratory effort, and oxygen levels, may help in the assessment of sleep-disordered breathing, but, as with polysomnography, such tests are neither necessary nor sufficient to diagnose insomnia.

Questionnaires probing insomnia-related symptoms and/or relevant risk factors and other conditions may have limited use in busy primary care settings, but clinicians should be broadly familiar with the four common tools summarized in Table 2.

Table 2. Questionnaires relevant to the assessment of insomnia

Questionnaire	# of Items	Scoring	Comments
Insomnia Severity Index (ISI)[49]	7	• 0–7, no insomnia • 8–14, subthreshold insomnia • 15–21, moderate insomnia • 22–28, severe insomnia	• Used to detect and quantify insomnia severity (patient's perception), assess its impact on daytime functioning, and monitor treatment response • Validated for use as screening tool in primary care • Correlates with sleep diaries, PSG, and patient self-report
Insomnia Symptom Questionnaire[50]	13	• Only questions 1, 2, or 5 are used to determine the presence, frequency and duration of sleep symptom criteria. • If the answer to all three questions is "yes" insomnia disorder is diagnosed.	• Patient-reported outcomes used to diagnose insomnia
Epworth Sleepiness Scale (ESS)[51]	8	• Each item scored on range of 0 (no chance) to 3 (high chance) • Score >10 indicates excessive sleepiness	• Used to measure sleepiness in daily life • Those with insomnia tend not to score above 10 on the ESS
Pittsburgh Sleep Quality Index (PSQI)[52]	19, plus optional 5 for bed partner	• Each item scored on range of 0 (not during past month) to 3 (3 or more times/week) • Score >5 considered a significant sleep disturbance	• Designed to assess sleep quality and disturbances over 1 month

BOTTOM LINE: Sleep architecture changes with age. Older adults typically fall asleep faster but sleep less and have more frequent awakenings throughout the night compared to younger adults. Assessing sleep problems includes asking not only about sleep itself, but a full medical history, a social history (e.g., employment, substance use), and a psychiatric assessment. Tools and techniques that may provide more data on a patient's sleep disorder include sleep diaries, actigraphy, polysomnography, home sleep testing, and formal questionnaires.

Managing acute insomnia

At the outset of any presentation of insomnia, the first task is to determine if the insomnia is **acute** (i.e., <3 months, usually with an identifiable stressor/precipitant) or **chronic** (i.e., ≥3 days per week for ≥3 months). In general, identify and address any stressors or cooccurring conditions affecting sleep patterns and use non-pharmacological approaches first (i.e., sleep hygiene and/or CBT-I), before prescribing a medication.

For acute insomnia that is severe or associated with significant patient distress, a short course of a sleep-promoting medication may be indicated (see more about the options in Table 13). Close follow-up is recommended to reassess sleep symptoms and to help prevent progression to chronic insomnia.

Sleep hygiene

Sleep hygiene consists of a range of common-sense approaches that can promote normal sleep patterns and which can be included in any overall treatment plan for a primary care patient with either acute or chronic insomnia. Sleep hygiene encompasses a range of behavioral and environmental strategies including:

- keeping a consistent wake time
- going to bed only when feeling sleepy; arising and getting out of bed when one cannot sleep during the desired sleep period
- using the bed solely for sleeping or sex
- avoiding long naps
- keeping the sleep environment cool, quiet, and dark
- limiting alcohol and nicotine use before bed
- avoiding caffeine within 10 hours of bedtime
- avoiding heavy meals or intense exercise before bed
- encouraging patients to not “try too hard” to sleep.[38]

The impact of caffeine on sleep, although widely recognized, was recently quantified in a study of 100 adults without insomnia or other sleep disorders.[4] Caffeine consumption (at any time of day) was associated with 397 minutes of nightly sleep compared to 432 minutes of nightly sleep in the same subjects when they did not consume caffeine (mean difference 36 minutes; 95% CI: 25 to 47 minutes).

In its latest set of guidelines for treating insomnia, the AASM recommended that clinicians not use sleep hygiene as a single-component therapy, although it noted that sleep hygiene techniques can be included in multicomponent interventions, including CBT-I or pharmacological treatments.[31] The AASM based its recommendation on the fact that only two low-quality randomized controlled trials (RCTs) showed clinically meaningful improvements with sleep hygiene alone and each had methodological limitations.[53,54]

Short-course CBT-I

Although CBT-I typically involves 6-8 sessions spread out over the course of weeks to months, some evidence points to the viability of shorter courses of CBT-I, particularly for acute insomnia. Ellis and colleagues evaluated the effectiveness of a single 60-70 minute session of CBT-I in an RCT of 40 adults who met DSM-5 criteria for insomnia with the exception that the duration of their symptoms was less than 3 months (i.e., acute insomnia).[55] At one-month follow-up, 60% of the treatment group had remitted (as defined by ISI score <10) compared to 15% of the control group (P<0.003). This is broadly consistent with

evidence from a dose-response evaluation of CBT-I in patients with chronic insomnia showing that while a four-session dose of CBT-I was optimal (58.3% patients demonstrated clinically relevant improvements), a single 45- to 60-min session was superior to a two-session dose and a full eight-session dose (43.8% versus 22.2% and 35.3%, respectively).[56]

Pharmacotherapy

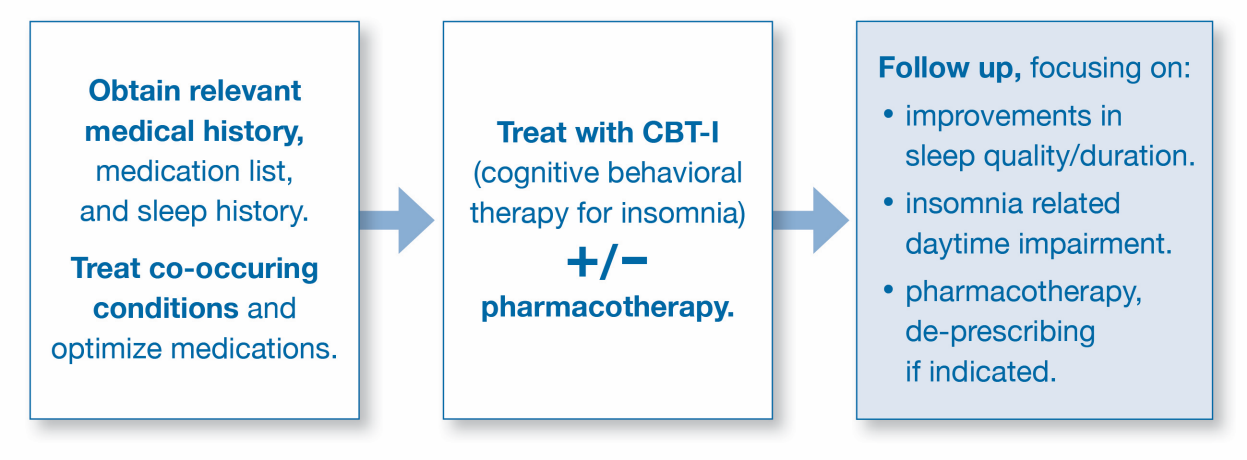
Short-term use of sleep-promoting medications may be indicated for patients with acute insomnia, with preferences for agents with relatively lower risks of potentially harmful side effects or risks of dependency (see detailed information below). Although benzodiazepines are not recommended for treating chronic insomnia, they may play a limited role in treating acute insomnia in selected situations (e.g., death of a spouse).

Managing chronic insomnia

As outlined in Figure 2, the broad approach to managing chronic insomnia (i.e., ≥3 days per week for ≥3 months) is to obtain all relevant histories related to sleep, medications (including non-prescription substances such as caffeine, cannabis, and alcohol), and medical conditions. As with acute insomnia, before treating chronic insomnia with medications or CBT-I, consider if the cause of the insomnia could be addressed with the techniques and strategies of sleep hygiene.

Treatment should be with CBT-I whenever possible, with pharmacotherapy reserved either as second-line treatment or as a short-term adjunct to CBT-I. Patients should be followed closely and regularly, particularly if medications are prescribed, in order to evaluate effectiveness and monitor for undesirable side effects. If the potential harms associated with a medication appear to outweigh the benefits, a careful regimen of deprescribing is warranted, particularly if benzodiazepines or Z-drugs have been prescribed.

Figure 2. Primary care approach to chronic insomnia[57]



Cognitive behavioral therapy for insomnia

CBT-I is a structured, time-limited approach using cognitive and behavioral tools coupled with education to improve sleep efficiency, duration, and quality. It targets the maladaptive thinking processes, beliefs, and behaviors that may underly insomnia, typically in 6-8 sessions over the course of several weeks to

months.[58] The essential premise of CBT-I is that it treats the root causes of insomnia, whereas medications of any kind do not and, in fact, may obscure a better understanding of the root causes by masking symptoms and leading to maladaptive sleep associations.

The AASM clinical guidelines[31] as well as those by the American College of Physicians[59] recommend CBT-I as first-line treatment for adults with chronic insomnia. This recommendation is based on favorable evidence for the clinical efficacy, durability of benefits, and safety of CBT-I. A number of trials have found that CBT-I is efficacious with durable effects and a favorable benefit-to-risk profile compared to pharmacologic alternatives,[60-62] however some trials have not demonstrated efficacy. For example, an RCT compared 6 weeks of treatment with CBT-I, trazodone, or placebo in 923 patients with sleep problems who were undergoing in-center hemodialysis.[63] At both 7 and 25 weeks after randomization, no clinically meaningful differences in ISI scores were observed between the three groups.

Components of CBT-I can include **cognitive therapy** to reduce anxiety and to set realistic expectations, **sleep restriction** to decrease time spent in bed and improve sleep efficiency, **stimulus control** (e.g., reserving time in bed for only sleep or sex), **relaxation techniques** (e.g., mindfulness meditation), and **sleep hygiene techniques** (Figure 3).[17]

Figure 3. Components of CBT-I[64]

Cognitive therapy	Sleep restriction	Stimulus control	Sleep habits	Relaxation techniques
Addresses dysfunctional attitudes and reframes negative beliefs about sleep.	Sets strict limits on the time spent in bed with adjustments over time.	Creates a positive, relaxing response to going to bed each night.	Improves or corrects habits that disturb sleep.	Teaches how to relax mind and body through muscle relaxation and deep breathing.

Cognitive therapy is a structured, time-limited approach to identify, expose, and reframe dysfunctional beliefs and attitudes about sleep.[65] For example, if patients think “I dread going to bed because I won’t be able to sleep,” they may be encouraged to change their thinking to “Even if it takes a little while to fall asleep, I’ll be OK tomorrow.”

Sleep restriction, also known as sleep consolidation, aims to improve sleep efficiency by reducing time spent awake in bed and increasing sleep “drive,” i.e., the felt urge to sleep. Components include using a sleep diary to establish baseline sleep patterns, limiting time in bed to the patient’s average total sleep time plus 30 minutes (as long as the total is >6 hours of sleep), waking at the same time every day regardless of bedtime or if sleepy, and adjusting sleep time in 15 minute increments until sleep is optimized.[31]

Stimulus control promotes a consistent sleep-wake schedule and reduces conditioned responses related to sleep by building associations between the bedroom and sleep. Patients are advised to only use the bed for sleep and sex, to avoid screen time in bed, and to get out of bed at night if they are having trouble sleeping.

Sleep habits refers to using the elements of sleep hygiene to promote sleep, including maintaining a comfortable sleep environment and reducing substances that disrupt sleep.

Relaxation techniques (e.g., mindfulness meditation, yoga nidra) focus attention on the breath and/or on progressive conscious relaxation and awareness of the entire body. These techniques may, or may not, be included in an overall CBT-I strategy. A meta-analysis of 6 randomized trials (total N=330) found that mindfulness meditation, as compared to waitlist or attention control groups, reduced total wake time, sleep onset latency, self-rated sleep scores, and increased sleep quality and sleep efficiency, although none of the differences reached statistical significance.[66]

Yoga nidra is a form of guided meditation to progressively relax the body and allow for slumber if it occurs.[67] A German study randomized 859 online participants (mean age 38 years, 80% female) to receive an 11-minute yoga nidra guided audio instruction, to be used as needed vs. a waitlist group.[68] Participants were from a general population and no sleep-related inclusion or exclusion criteria were used. Sleep was assessed with a German version of the PSQI at baseline, 30 days, and 72 days. At both endpoints very small improvements in sleep quality were observed in the yoga nidra group (Cohen's d = 0.13 at 30 days and 0.02 at 72 days). On self-reported measures of stress and well-being, yoga nidra participants showed small improvements compared to wait list.

Evidence for CBT-I effectiveness

The evidence base for CBT-I is broad and of sufficiently high quality to support its being recommended as the gold standard treatment for chronic insomnia by professional organizations. A 2015 systematic review and meta-analysis of 20 randomized trials including 1,162 adults with chronic insomnia evaluated CBT-I against inactive comparators and found clinically meaningful benefits for a range of sleep-related outcomes summarized in Table 3.[69]

Table 3. Effects of CBT-I on sleep parameters in patients with chronic insomnia[69]

Sleep parameter	Average CBT-I effect
Sleep onset latency	↓ 19 minutes
Wake after sleep onset	↓ 26 minutes
Total sleep time	↑ 8 minutes
Sleep efficiency	↑ 10%

The effects of CBT-I on quality of life were evaluated in a meta-analysis of 24 studies comprising 1,977 adults with insomnia treated with CBT-I (using varying delivery methods) or a control condition. Robust improvements (reported as effect sizes in quality of life measures) were observed among those treated with CBT-I regardless of delivery mode (Table 4 on the next page).[70]

Table 4. Effects of CBT-I on quality of life in patients with chronic insomnia[70]

CBT-I format	N of studies	Effect size (standardized mean difference)
Face-to-face	11	0.46 (0.01 – 0.90)
Online	8	0.47 (0.01-0.92)
Group	5	0.46 (0.12-0.80)

In evaluations comparing CBT-I to other kinds of treatments, the effect sizes for short-term improvements in insomnia symptoms using CBT-I are comparable to the effect sizes observed in similar analyses of benzodiazepines used to treat insomnia[71], or non-benzodiazepine hypnotics for insomnia[72], but the benefits of CBT-I are more sustained in the long term and CBT-I has none of the potential adverse effects of medications. Some key papers are summarized here.

A 2024 network meta-analysis of 241 randomized trials including 31,452 adults with chronic insomnia found that, compared to psychoeducation as a referent, CBT-I was associated with the greatest likelihood of insomnia remission (odds ratio [OR] 3.79; 95% CI: 3.21-4.47), followed by behavioral therapy alone (OR 2.50; 95% CI: 1.93-3.24) and cognitive therapy alone (OR 2.49; 95% CI: 1.59-3.92).[73]

A small RCT of 46 Norwegian adults with chronic insomnia compared six weeks of CBT-I (n = 18) to six weeks of treatment with the benzodiazepine receptor agonist zopiclone (7.5 mg/nightly, n=16) or placebo (n=12).[74] Sleep diary data were used to determine total wake time, total sleep time, and sleep efficiency, and polysomnography was used to assess slow-wave sleep (deep sleep important for many function such as memory consolidation). CBT-I was associated with improved sleep efficiency (from 81.4% at pretreatment to 90.1% at 6-month follow-up) compared with a decrease from 82.3% to 81.9% in the zopiclone group. Participants in the CBT-I group spent much more time in slow-wave sleep (stage 3) compared with those in other groups, and spent less time awake during the night. Total sleep time was similar in all three groups at six months, although patients receiving CBT-I had better sleep efficiency as assessed with polysomnography than those taking zopiclone. For most outcomes, zopiclone did not differ from placebo.

Overcoming barriers to the use of CBT-I

Despite being widely recommended, CBT-I is not widely prescribed or used. Fewer than 10% of patients with insomnia were referred to CBT-I services in an observational study involving 239 hospital-based clinicians.[75] The underuse of CBT-I may be related to knowledge barriers (e.g., providers or patients unfamiliar with CBT-I) and logistical barriers (e.g., shortage of trained CBT-I therapists, cost, geographic barriers).[76,77] The use of CBT-I may also be limited because it involves a high degree of effort and self-discipline, as shown in several qualitative surveys of patients using CBT-I.[78,79]

A qualitative study conducted in Great Britain among 28 patients with insomnia and 23 treating health professionals found that nearly 60% of the clinicians had either not heard of CBT-I or were unfamiliar with how it worked.[80] The study also documented some trends in treatment and patient behaviors that apply broadly. For example, clinicians often focused on sleep hygiene, rather than the more comprehensive and effective CBT-I. Clinicians expressed ambivalence about hypnotic drugs but often prescribed them anyway to avoid confrontation with patients or to express empathy with the patient. Patients, on the other hand, reported that they sometimes took hypnotics in ways that were not intended, for example together

with over-the-counter medication. Clinicians sometimes prescribed hypnotics despite concerns about addiction, but at other times withdrew hypnotics abruptly without continuing to treat insomnia symptoms.

Some of the barriers to broader use of CBT-I mentioned above may be ameliorated with the use of technology. Although classic CBT-I is delivered face-to-face by health care providers trained in behavioral sleep medicine, CBT-I delivered digitally (dCBT-I) via smartphones, tablets, or computers is increasingly available and provides a valid option for those who lack access to a sleep psychologist or the funds to pay for in-person CBT-I.[64] Consumer sleep applications (apps) (i.e., non-prescription programs marketed directly to consumers that claim to perform sleep monitoring, tracking, and sleep-related interventions) have become increasingly prevalent over the past decade,[81] with some suggesting that digital delivery of CBT-I may help address the shortage of trained therapists.[82] Applications delivering CBT-I in fully-automated and remote ways are available, some of which (e.g., Sleepio, Sleeprate, Sleep Reset) have been shown effective in industry-funded randomized trials.[83]

A recent network meta-analysis evaluated the efficacy of web-based CBT-I for adults with insomnia compared to usual care.[84] Fifty-four RCTs comprising 11,815 participants were included. Compared with usual care, web-based CBT-I with a therapist demonstrated significantly longer total sleep time (mean difference [MD]: 23.19 min, 95% CI 18.98-27.39 min), shorter sleep onset latency (MD: -18.76 min, 95% CI -24.20 to -13.31 min), lower rates of waking after sleep onset (MD: -31.40 min, 95% CI -36.26 to -26.55 min), and greater sleep efficiency (MD: 10.37%, 95% CI 8.08%-12.65%).

The results from two other meta-analyses are compared in Table 5, illustrating broad equivalence across sleep outcomes between digitally-delivered CBT-I and traditional CBT-I.[69,85]

Table 5. Effects on sleep parameters using digital CBT-I vs. traditional CBT-I[69,85]

Sleep parameter	dCBT-I effect	CBT-I effect
Sleep onset latency	↓ 11 minutes	↓ 19 minutes
Wake after sleep onset	↓ 20 minutes	↓ 26 minutes
Total sleep time	↑ 20 minutes	↑ 8 minutes
Sleep efficiency	↑ 7%	↑ 10%

The results of a network meta-analysis evaluating 86 randomized trials comparing CBT-I, whether digital or in-person, delivered in a variety of formats on a range of daytime symptoms are summarized in Table 6.[86] Effect sizes for the observed improvements in symptoms ranged from moderate to large.

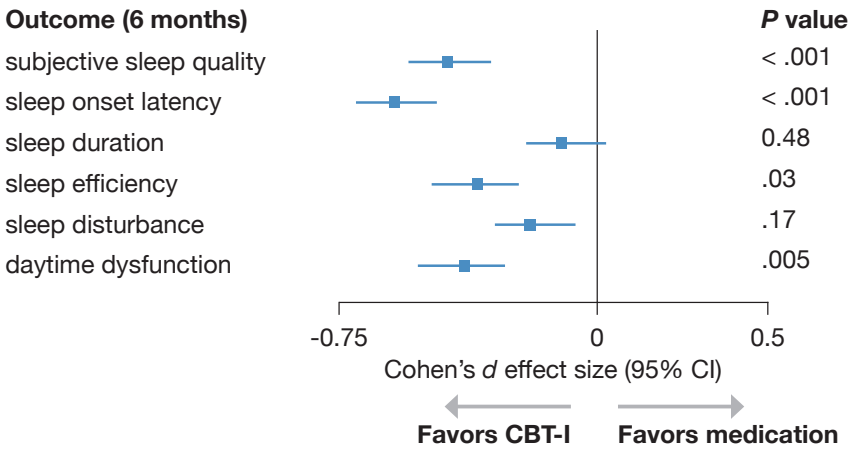
Table 6. Benefits of digital CBT-I and its components on insomnia-related outcomes[86]

Delivery	Depre-ssion	Anxiety/ worry	Daytime sleepiness	Fatigue	Daytime and social function	Physical function	Mental state	Quality of life
Individual face-to-face	✓	✓	✓	✓	✓			✓
Group	✓	✓	✓	✓	✓		✓	
Self-help (internet)	✓	✓	✓	✓	✓		✓	
Self-help (internet + therapist)	✓	✓		✓	✓			✓
Self-help (booklet)						---	✓	
Self-help (booklet + therapist)		---	✓	✓	✓	---		---

✓ significant improvement vs. control; --- no studies analyzed for outcome; (blank) no significant improvement vs. control

In a related study, the effects of dCBT-I were shown to persist relatively long after the intervention ended. In a retrospective cohort study of 4,052 patients comparing patients who used a dCBT-I application (Good Sleep) or any kind of medication prescribed for sleep (primarily benzodiazepines, Z-drugs, and trazodone) all sleep outcomes favored dCBT-I at 6-month follow-up (Figure 4).[87]

Figure 4. Sleep-related outcomes at 6-month follow-up in cohort of 4,052 patients[87]



BOTTOM LINE: CBT-I is a structured, time-limited approach to improve sleep efficiency, duration, and quality. Components can include sleep restriction, cognitive therapy, stimulus control, relaxation techniques, and sleep hygiene. The evidence base for CBT-I is robust, and it is recommended as the gold standard treatment for chronic insomnia by professional organizations. Digital options for delivering CBT-I works just as well as traditional in-person CBT-I and may help overcome limited access and availability.

Medications for insomnia

Human sleep/wake cycles are controlled or modulated by many brain regions including the brain stem, limbic system, and prefrontal cortex. Medications used to treat insomnia target these systems, either directly or indirectly. How these medications affect sleep (and their potential adverse effects) depend on which region or sub-region is either activated or inhibited. This section will cover medications with FDA-approved indications for insomnia: dual orexin receptor antagonists (DORAs), benzodiazepines, Z-drugs, doxepin, and ramelteon as well as medications prescribed or used off-label (sedating antidepressants, over-the-counter melatonin, cannabis, and antihistamines).

Regular use of sleep medications is relatively common. In a 2020 National Health Interview Survey of 21,153 adults, 10% of respondents said they take some kind of sleep medication “some days” in the past 30 days, and 6.3% said they take such medication “every day.”[88]

Medications can be used as an adjunct to CBT-I (or components of CBT-I) and some evidence suggests that such combination therapy can be effective. A trial of 160 adults with chronic insomnia randomized patients to either CBT-I alone or CBT-I plus the Z-drug zolpidem (10 mg/night) for 6 weeks and then offered another 6 weeks of CBT-I as extended therapy (with zolpidem use allowed but not mandated).[89] Sleep outcomes were assessed by sleep diaries and rates of response and remission were evaluated using the ISI. The best outcomes were observed in patients treated with combined therapy initially followed by CBT-I alone compared to patients who continued to take zolpidem during the extended therapy (remission at 6-months 68% vs. 42%, P=0.04). Another randomized trial (N=63 adults with chronic insomnia), however, found no significant differences in sleep latency or sleep efficiency outcomes comparing CBT-I to a combination of CBT-I and zolpidem.[90]

Dual orexin receptor antagonists

Dual orexin receptor antagonists (DORAs) are the only class of insomnia medications that facilitate sleep by decreasing the wake drive rather than inducing sedation. Orexin is an excitatory brain peptide produced in the hypothalamus that exists in two forms (A and B), which bind to two associated receptors on post-synaptic neurons that project widely and help regulate sleep/arousal cycles in vertebrates.[91] DORAs target orexin signaling by antagonistically binding to both receptors, promoting sleep and sleep maintenance. DORAs have been reported not to adversely affect overall sleep architecture, to shorten REM latency, and to increase total sleep time primarily by increasing duration of REM sleep.[92]

The three currently-approved DORAs (suvorexant, lemborexant, and daridorexant) are associated with increases in sleep latency and total sleep time and decreases in waking after sleep onset. Table 7 summarizes efficacy data for lemborexant, which is typical of the class, and includes a comparison with zolpidem ER.

Table 7. Efficacy of the DORA lemborexant vs. zolpidem and placebo[93]

Adults >55	Placebo	zolpidem ER 6.25 mg	lemborexant 5 mg	lemborexant 10 mg
Sleep latency	36 min	37 min*	**26 min**	**23 min**
Sleep efficiency	75%	**77%**	**81%**	**82%**
WASO (whole night)	92 min	**78 min**	**69 min**	**69 min**
WASO (second half of the night)	64 min	**57 min**	**49 min**	**48 min**

All results in bold statistically better than placebo; * result statistically worse than placebo

DORAs may have characteristics that favor their use in older adults, compared to benzodiazepines or Z-drugs. An RCT in 1,006 adults aged ≥55 years with insomnia found that lemborexant at the 5 mg dose showed no differences in scores on cognitive performance tests after 1 month vs. placebo and that at both the 5 mg and 10 mg doses lemborexant caused less postural instability than zolpidem.[94] An analysis of next-morning and across-the-day residual effects of lemborexant across 9 clinical trials showed no significant differences in driving performance vs. placebo, and significantly greater alertness with lemborexant compared to placebo at 6 months follow-up.[95] DORAs are not currently listed in the American Geriatrics Society's Beers Criteria for potentially inappropriate medications use in older adults.[96]

To date, no evidence has suggested that DORAs are associated with tolerance, withdrawal, or rebound insomnia upon sudden termination.[97] DORAs are associated, however, with some side effects. In a network meta-analysis of DORAs, the most frequently-reported adverse events were next-day somnolence (rates ranging from 4.1%-13.2%), nasopharyngitis (4%-12%), and headache (4.9%-14.9%).[93]

Little evidence about the abuse potential of DORAs exists outside of a small study in recreational sedative users. This study randomized 32 such users to three different doses of the DORA lemborexant compared with placebo, zolpidem 30 mg, and suvorexant 40 mg.[98] Lemborexant demonstrated abuse potential at all studied doses compared to placebo, and scores on the abuse potential of lemborexant were similar to those for zolpidem and suvorexant. In light of the limited evidence, the U.S. Drug Enforcement Agency includes DORAs as Schedule IV controlled substances, similar to Z-drugs.

BOTTOM LINE: DORAs work via a different mechanism of action than benzodiazepines or Z-drugs. They appear as generally effective as Z-drugs but without the same day-after adverse effects. DORAs, unlike benzodiazepines or Z-drugs, are not included on the Beers List of drugs to avoid in older adults. These medications are relatively new, however, and clinical experience with them is still evolving.

Doxepin and other antidepressants

Doxepin is a tricyclic antidepressant that selectively blocks both H1 and H2 histamine receptors at low doses and is FDA-approved for insomnia (Silenor, generics) at doses from 1-6 mg.[99] While the higher doses indicated for the treatment of depression can cause anticholinergic side effects, low dose doxepin (i.e., <25 mg) used for sleep does not have similar effects and is safe for use in older adults.[96] The most

frequently-reported side effects include somnolence and headache, although discontinuation rates in clinical trials have been similar to placebo (range 1% to 4%).[99]

In a systematic review of five clinical trials, three of which were conducted in older adults (n=571) doxepin at 3 mg and 6 mg was found to significantly reduce waking after sleep onset and increase total sleep time, but did not affect sleep onset compared to placebo, with no significant differences between doses (Table 8).[99]

Table 8. Sleep outcomes with doxepin in five trials vs. placebo[99]

	All – 3mg	Age >65 – 3mg	All – 6mg	Age >65 – 6mg
Wake after sleep onset	↓ 20 min	↓ 23 min	↓ 28 min	↓ 34 min
Total sleep time	↑ 25 min	↑ 30 min	↑ 30 min	↑ 38 min

Other antidepressants

The use of other antidepressants (e.g., trazodone, amitriptyline) to treat insomnia is widespread, although none are FDA approved for this indication and evidence for their efficacy is limited. In a study of 902 million outpatient visits in 2006, off-label antidepressants were prescribed more frequently (45.1%) than either Z-drugs (43.2%) or benzodiazepines (11.7%).[100] Trazodone was the most-frequently-prescribed off-label antidepressant (17.9%) followed by amitriptyline, mirtazapine, and nortriptyline. Indeed, off-label prescriptions for trazodone for insomnia far exceed the rate of prescription for its approved use as an antidepressant.[101] Prescribers may be turning to trazodone and other antidepressants because they are inexpensive, have low potential for misuse, and are not considered controlled substances by the Drug Enforcement Agency.[101]

Despite its widespread use, trazodone is not recommended by the AASM due to a relative lack of evidence for its efficacy, although some evidence does, in fact, exist. In a Cochrane review of antidepressants for insomnia, three studies (N=370) of trazodone were analyzed and, in meta-analyzes, showed a moderate improvement in subjective sleep outcomes vs. placebo (standard mean difference score on visual analog scale or subjective sleep rating -0.34 standard deviations; 95% CI: -0.66 to -0.02).[102] In two studies of trazodone (N=169) using polysomnography to measure sleep efficiency, no significant difference was found compared to placebo (mean difference 1.38 percentage points; 95% CI: -2.87 to 5.63. In two studies, trazodone was more frequently associated with adverse effects of morning grogginess, dry mouth, and thirst. In general, higher doses of tricyclic antidepressants are more likely to exert noradrenergic effects, which could be stimulating, and increase the risks of side effects such as weight gain or dizziness.

BOTTOM LINE: The tricyclic antidepressant doxepin at low doses can be an effective sleep aid with less abuse potential than benzodiazepines or Z-drugs, however they may pose problematic drug interactions, particularly if a patient is on a serotonergic medication. Other antidepressants, such as trazodone, have only weak evidence for efficacy and, thus, are not currently recommended by AASM.

Melatonin receptor agonists

Ramelteon

Ramelteon (Rozerem, generics) is a prescription melatonin receptor agonist that binds to two forms of melatonin receptors in the suprachiasmatic nucleus, which helps control circadian rhythms in sleep and wakefulness.[103] The affinity of ramelteon for its receptors is 3-16 times higher than that of endogenous melatonin.[104] Ramelteon is reported to have no affinity for dopamine, opiate, serotonin, or GABA receptors, which may limit its range of unwanted side effects and reduce its potential for misuse.[103] Reported adverse effects with ramelteon include headache, somnolence, fatigue, nausea, and dizziness with the overall incidence of adverse effects in clinical trials being similar to placebo.[105]

The efficacy of ramelteon in older adults was evaluated in a clinical trial involving 829 adults aged ≥65 years who were randomized to ramelteon at 4 mg or 8 mg doses or placebo taken nightly for 5 weeks.[106] At week 5, sleep latency was 63.4 min with ramelteon 4 mg vs. 70.6 min for placebo (P=0.028) and 57.7 min with 8 mg vs. 70.6 min with placebo (P<0.01). Total sleep time was increased significantly at 1- and 3-week follow-up, but not at 5-week follow-up. No evidence of rebound insomnia or withdrawal effects were observed after treatment discontinuation.

Another very short-term study of ramelteon randomized 566 patients to an 8 mg dose and 556 to placebo.[107] On nights 1 and 2 sleep latency was 30 minutes in the ramelteon group vs. 43 minutes in the placebo group (P<0.001). In this study 3.5% of patients reported somnolence as an adverse effect vs. 0.7% for placebo.

Over-the-counter melatonin

Over-the-counter use of melatonin supplements has risen in recent decades, particularly at doses >5 mg, which is the high end of recommended doses.[108] The latest AASM guidelines do not recommend over-the-counter melatonin based on the very low quality of evidence from three studies evaluating melatonin at 2 mg doses and the lack of any clinically meaningful results from these studies.[109] In addition, a meta-analysis of 24 randomized controlled trials comparing melatonin to a placebo found no significant improvements in sleep onset latency, total sleep time, or sleep efficiency in adults.[110]

Importantly, melatonin is not FDA-regulated and wide variations in the actual content of the marketed supplements has been reported. In an analysis of 31 melatonin supplements using ultraperformance liquid chromatography for quantification of melatonin and serotonin, melatonin content was found to range from -83% to +478% of the labelled content.[111] Serotonin (measured because it has historically contaminated OTC melatonin) was identified in eight supplements at levels of 1 to 75 mg (within 10%) in more than 71% of the supplements studied.

BOTTOM LINE: The prescription melatonin agonist ramelteon is modestly effective for improving sleep outcomes and has not been reported to induce rebound insomnia or withdrawal effects on discontinuation. Over-the-counter melatonin is not recommended due to lack of evidence of efficacy and wide variations in the potency and integrity of ingredients among studied brands.

Z-drugs

Z-drugs induce central nervous system depression and have sedative (but not anxiolytic) effects by enhancing the inhibitory effects of gamma-aminobutyric acid (GABA). Z-drugs have been shown in a variety of short-term trials to improve sleep onset, sleep time, and sleep quality (Table 9).

Table 9. Efficacy of Z-drugs on selected sleep outcomes compared to placebo[109,112,113]

	zolpidem (Ambien)	eszopiclone (Lunesta)	zaleplon (Sonata)
Sleep latency	5-12 min	14 min	10 min
WASO	25 min	10-14 min	No data
Total sleep time	29 min	25-57 min	No data
Sleep quality	Moderate improvement	Moderate-to-large improvement	No improvement

Table 10. Z-drug half-life and potency[114]

Generic	Brand name	Half-life (hours)	Equivalent potency (lorazepam equivalents)
zaleplon	Sonata	1-2	20
zolpidem	Ambien	2	20
eszopiclone	Lunesta	6	3

Table 11 summarizes currently-available Z-drugs, release formulations, and recommended doses.

Table 11. Z-drug formulations and dosing[109]

	Dose	Sleep onset	Sleep maintenance
Zolpidem			
Immediate release (Ambien, generics)	5 mg – women, older adults* 5-10 mg – men	✓	✓
Extended release (Ambien CR, generics)	6.25 mg – women, older adults 6.25-12.5 mg – men	✓	✓
Sublingual (Intermezzo, generics)	1.75 mg – women, older adults 1.75-3.5 mg – men		✓

Eszopiclone (Lunesta, generics)	1-3 mg 2 mg max in older adults	✓	✓
Zaleplon (Sonata, generics)	5-20 mg 5 mg max in older adults	✓	

**The FDA changed its recommended dosing of Z-drugs in women based on evidence that women metabolize these drugs more slowly than men.*[115]

As with benzodiazepines, Z-drugs are associated with a range of side effects and potential adverse events, the most common of which are dizziness, somnolence, drowsiness, and complex sleep-related behaviors such as sleep-walking, sleep-driving, and sleep-eating. These medications should be avoided in older adults and those with cognitive impairments.[96] Patients should be cautioned about next-morning impairment for activities that require complete mental alertness (e.g., driving, operating heavy machinery) and warned that these effects may be particularly problematic with eszopiclone and zolpidem CR given their long half-lives. Patients should discontinue use of these medications and avoid others in the same class if they experience an episode of complex-sleep related behavior. No differences in elimination times was observed based on race, ethnicity, or body mass index. Adults over age 65 typically required lower doses due to age-related changes in rates of absorption and elimination.

The risk of fall-related injuries may vary between the available Z-drugs. A case-crossover study among adults aged ≥65 years hospitalized for either fall-related traumatic brain injury (TBI) (N=15,031) or hip fracture (N=37,833) compared injury rates among those prescribed either zolpidem or eszopiclone to matched controls.[116] The use of zolpidem, but not eszopiclone, in the month prior to injury was associated with increased risk for TBI (OR 1.87; 95% CI: 1.56-2.25) and hip fracture (OR 1.59; 95% CI: 1.41-1.79).

BOTTOM LINE: As with benzodiazepines, Z-drugs are associated with a range of side effects and potential adverse events, the most common of which are dizziness, somnolence, drowsiness, and complex sleep-related behaviors such as sleep-walking, sleep-driving, and sleep-eating. They are not recommended for use in older adults or anyone with cognitive impairment.

Benzodiazepines

Benzodiazepines are sedative hypnotics that enhance the inhibitory effects of GABA causing central nervous system depression and sedative/anxiolytic effects. Benzodiazepine use is relatively common in older adults, with 10.4% reporting any use in the prior year in a 2021 national survey.[15] Not all benzodiazepines are approved for an indication of insomnia. Those that are include triazolam, temazepam, estazolam, flurazepam, and quazepam.

Benzodiazepines have been shown to slightly reduce sleep latency and nocturnal awakenings, but they also reduce REM sleep.[117] Benzodiazepines are associated with a range of adverse effects that may be particularly significant in older adults, including increasing the risk of memory impairment, falls, fractures, motor vehicle accidents, and avoidable emergency department visits.[118]

Although benzodiazepines are unlikely to cause dementia, they are associated with cognitive impairment. A prospective study followed 10,263 adults aged ≥65 years for 10 years and found an increased risk for cognitive impairment (HR 1.32; 95% CI: 1.04-1.68) but not Alzheimer disease (HR 0.84; 95% CI: 0.63-1.12) or all-cause dementia (HR 0.86; 95% CI: 0.68-1.09).[119] Prolonged use of benzodiazepines can lead to physical and psychological dependence, with attendant increased risks of addiction, abuse, and

overdose.[120] Abrupt discontinuation following prolonged use typically results in withdrawal symptoms of insomnia and anxiety and can lead to life-threatening complications such as seizure.

Benzodiazepines are associated with increased risk of suicide in some patients. An observational study comparing a group of 86 adults aged ≥50 years who completed suicide to a control group matched on age, gender, race, and county of residence found that 25% of those who committed suicide used benzodiazepines, compared to 6% of controls (OR 3.1; 95% CI: 1.2-9.9).[121] Another study of 17,608 adults aged ≥50 years found a similar increased risk of suicide with benzodiazepine use (adjusted OR 2.0; 95% CI: 1.01-3.94).[122] Screening older patients for suicide risk is recommended[122] using a screening tool such as a 4-question tool developed by the National Institute for Mental Health.[123]

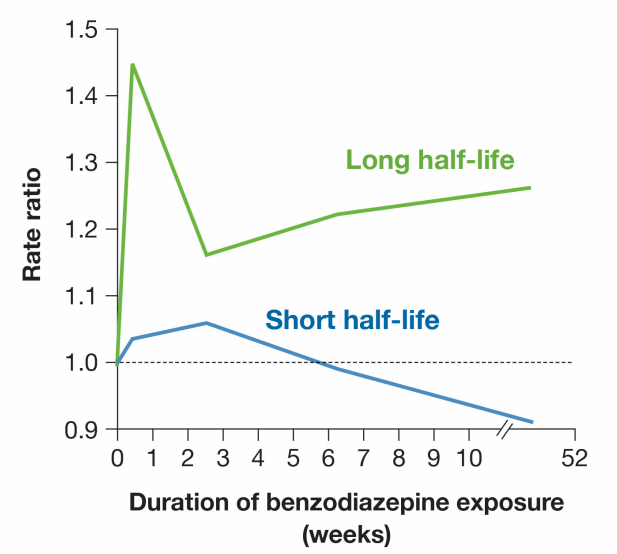
The co-prescription of benzodiazepines and opioids is particularly hazardous. Of the 118,208 overdose deaths involving benzodiazepines that occurred between 2000 and 2019, 83.5% also involved opioids, as assessed by analysis of ICD-10 codes for presence of opioids and other substances.[124]

Benzodiazepines vary considerably in their potencies and half-lives (Table 12). The risk of adverse events can be associated with the half-life of the specific benzodiazepine prescribed. In a cohort study of 5,579 drivers using benzodiazepines matched with 13,256 controls, the risk of traffic accidents increased after initiation of long half-life benzodiazepine and throughout the first year of prescribing, while risk increased only slightly at first with short-half-life benzodiazepines, which then became non-significant after 6 weeks of prescribing (Figure 5).

Table 12. Benzodiazepine half-life and potency[114]

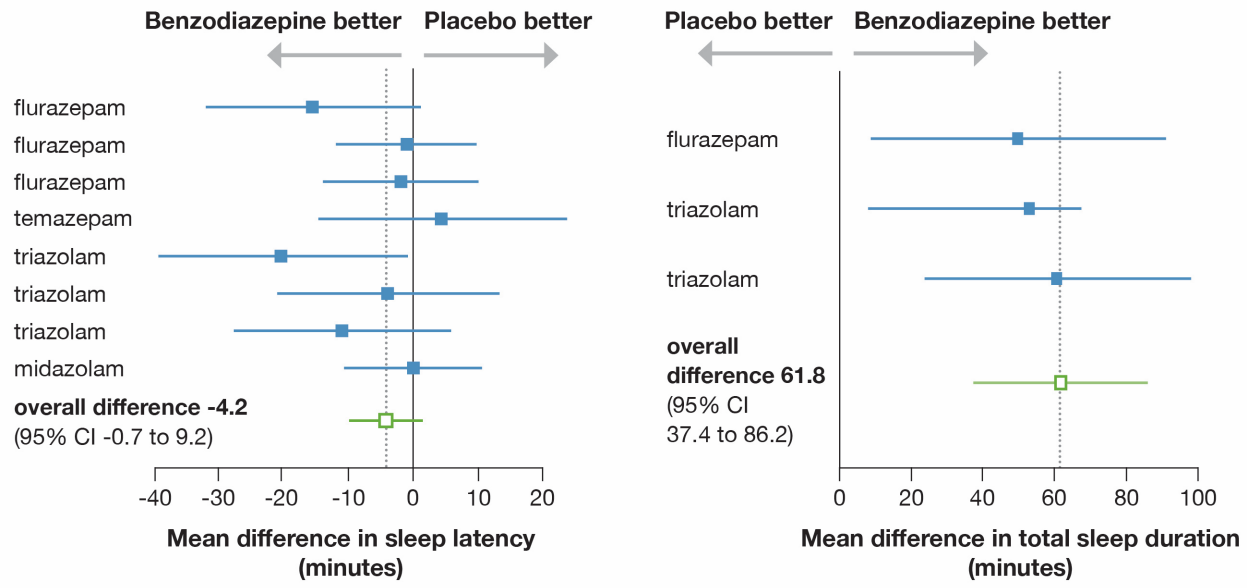
Generic	Brand name	Half-life (hours)	Equivalent potency (lorazepam equivalents)
oxazepam	Serax	4-15	20
alprazolam	Xanax	6-12	0.5
temazepam	Restoril	8-22	20
lorazepam	Ativan	10-20	1
clonazepam	Klonopin	18-50	0.5
diazepam	Valium	20-100	10
chlorazepate	Tranxene	36-200	15

Figure 5. Risk of traffic accidents in older adults prescribed long- vs. short-half-life benzodiazepines



In addition to these risks, benzodiazepines are only modestly effective for insomnia. A meta-analysis of 45 randomized trials comparing benzodiazepines to either placebo or to another medication (15 of which included patients aged ≥65 years) over short time frames (median trial duration 7.5 days) and with small sample sizes (i.e., study Ns ranged from 12-50) found no significant difference in sleep latency (mean decrease 4.2 minutes; 95% CI: -0.7 to 9.2 minutes) and a significantly increased total sleep duration (61.8 minutes; 95% CI: 37.4-86.2 minutes) (Figure 6).[126]

Figure 6. Minimal benefits on insomnia symptoms in meta-analyses of benzodiazepine trials[126]



Analysis of side effects in the meta-analysis found reduced number of nocturnal arousals with benzodiazepines, confirmed with EEG recordings or self-reported rating scales, although these effects waned after 28 days. Adverse effect associated with benzodiazepines included daytime drowsiness,

dizziness, lightheadedness, and cognitive impairments. Drop-out rates were similar between placebo and benzodiazepine groups.

BOTTOM LINE: Benzodiazepines are associated with a range of potential harms including dependence, misuse, driving impairment, cognitive impairment, and increased suicide risk. Short-term use of benzodiazepines (i.e., <1 month) provides only modest clinical efficacy and such use should be intermittent or as-needed, not continuous. Long-term use of benzodiazepines increases the risk for adverse events. Alternative treatments for insomnia should be recommended for patients with insomnia.

Cannabis

The effects of tetrahydrocannabinol (THC) and cannabidiol (CBD) on sleep have not been clearly established due, in part, to the fact that both compounds are found, in varying proportions, in many forms of cannabis (e.g., "flower," oils, edibles). In a study with 8 healthy adults using purified THC and/or CBD delivered as oral mucosal sprays and using electroencephalographic recordings during sleep, no effects on sleep were observed with 15 mg of THC administered at 10 p.m.[127] When both THC and CBD were administered (up to 15 mg THC and 15 mg CBD), stage 3 sleep (deep sleep important for many functions) was decreased and wakefulness was increased. In assessments the day after administration of 15 mg THC, memory was impaired, sleep latency was reduced, and subjects reported mood changes and increased sleepiness. In general, 15 mg THC appeared to be sedative, while 15 mg CBD appeared to be alerting.

A recent scoping review of cannabis used for sleep disorders demonstrated the need for much more rigorous evaluations of cannabis efficacy for treating insomnia. Of the 40 studies included in the review, only 25% were RCTs, and only 20% used comparable sleep outcomes.[128] The use of cannabis was reported to improve sleep in 21% of the studies, to worsen sleep in 48% of studies, showed mixed results related to sleep in 14% of studies and had no impact one way or the other in 17% of studies. A 2022 systematic review of 31 studies reached similar general conclusions. The review found sleep improvements in 7 out of 19 randomized studies and in 7 out of 12 uncontrolled trials, with no significant differences observed between the effects of THC and CBD.[129] Improved sleep was observed more frequently in studies of patients with pain-related disorders, compared to patients with neurologic, psychiatric, or primary sleep disorders, and no effects on sleep were observed among healthy participants. Heterogeneity in cannabis types, doses, timing of administration, and sleep outcome measures precluded meta-analyses of the data from the studies and such heterogeneities pose challenges to a better understanding of the role that cannabis or its components could play for the treatment of sleep disorders generally.

As with OTC melatonin products, labeling of OTC CBD products has been shown to be often inaccurate, and some degree of contamination with other, unlabeled cannabinoids, have been demonstrated. In an analysis of 84 OTC products containing CBD, 26% contained less CBD than was indicated on the label and 43% had more CBD than was labeled.[130] In this study, THC was detected in 21% of the products (but was not included on the label).

BOTTOM LINE: The utility of THC and/or CBD for treating chronic insomnia has not been proven and evidence to date is mixed. The common presence of side effects such as memory impairment,

mood changes, and the possibility of worsening insomnia with THC or CBD mean these agents are not recommended as treatments in older adults.

Antihistamines

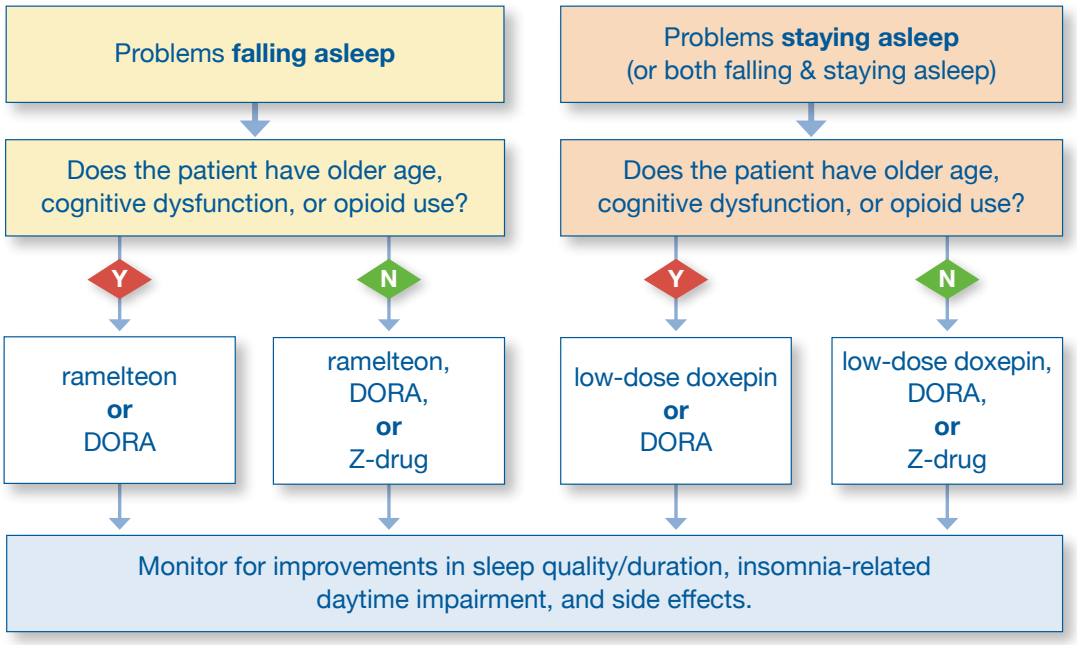
First generation antihistamines (diphenhydramine, doxylamine) marketed as Benadryl, Unisom, Nytol, Tylenol PM, and many others, are widely-available over-the-counter antihistamines with sedative properties that are commonly used as sleep aids. Because it has strong anticholinergic effects and is a potential deliriant in high doses diphenhydramine is on the Beers list of drugs to avoid in older adults.[96] In its latest recommendations, AASM recommended against using diphenhydramine for treating insomnia because the overall quality of evidence from meta-analyses was low and because the studies evaluated were industry-sponsored.[109] Adverse effects, including rebound insomnia, were minimal and not significantly different from placebo in the two trials of diphenhydramine considered by the AASM guideline committee.[131,132]

BOTTOM LINE: First generation antihistamines (diphenhydramine, doxylamine) are not recommended for the treatment of chronic insomnia in older adults due to lack of evidence for efficacy and the possibility of anticholinergic side effects.

Selecting and managing medications for sleep

Not all patients need medications for insomnia, particularly if they can use CBT-I instead. If a medication is needed, the choice of medication should be tailored to each patient. Start by assessing the primary sleep complaint and using that to drive medication choices.

Figure 7: Select the medication option for each patient[109]



The Table 13 (on the next page) summarizes information in the sections above to help clinicians select medications most appropriate for older adults.

Table 13. Medications used to treat insomnia

	Treatment (Brand)*	Half life	Quality of evidence	Safe in older adults	Factors for selection
Dual orexin receptor agonists (DORAs)	daridorexant (Quviviq)	short	Strong	●	• work by decreasing wake drive rather than inducing sedation • somnolence common • better tolerated than Z-drugs[133] • expensive
	lemborexant (Dayvigo)	inter-mediate	Strong	●	
	suvorexant (Belsomra)	inter-mediate	Strong	●	
Melatonin receptor agonists	ramelteon (Rozerem)	short	Moderate	●	• no residual daytime impairment[103] • don't take with or after high-fat meal
	melatonin (OTC)	short	Weak	●	• limited efficacy data • concerns about dose and purity
Sedating antidepres-sants	low-dose doxepin (Silenor)	inter-mediate	Strong	●	• most effective for sleep maintenance • low dose (1-6 mg) avoids anticholinergic side effects and QTc prolongation[134]
	trazodone (Desyrel)	inter-mediate	Weak	●	• unclear efficacy data • few side effects at low doses (<50 mg); higher dose increases anticholinergic risk
Z-drugs	zolpidem (Intermezzo, Ambien, Ambien CR)	short inter-mediate long	Strong	○	• not recommended in older adults, particularly those with cognitive impairment[135] as they can cause daytime sedation or confusion • do not combine with other sedating medications (e.g., opioids, benzodiazepines)
	eszopiclone (Lunesta)	short	Strong	○	
	zaleplon (Sonata)	short	Strong	○	
Benzodia-zepines	alprazolam (Xanax)	inter-mediate	Weak	✕	• not recommended in older adults[135] • use only for short periods (<1 month); longer-term use is not effective. • risk of physiologic dependence, tolerance, cognitive impairment, driving problems
	temazepam (Restoril)	inter-mediate	Moderate	✕	
	clonazepam (Klonopin)	long	Weak	✕	
Antihista-mines	diphenhydramine (Benadryl)	long	Weak	✕	• not recommended in older adults due to anticholinergic side effects (e.g., dry mouth, constipation) • included in multiple OTC products (e.g., Tylenol PM, ZzzQuil)

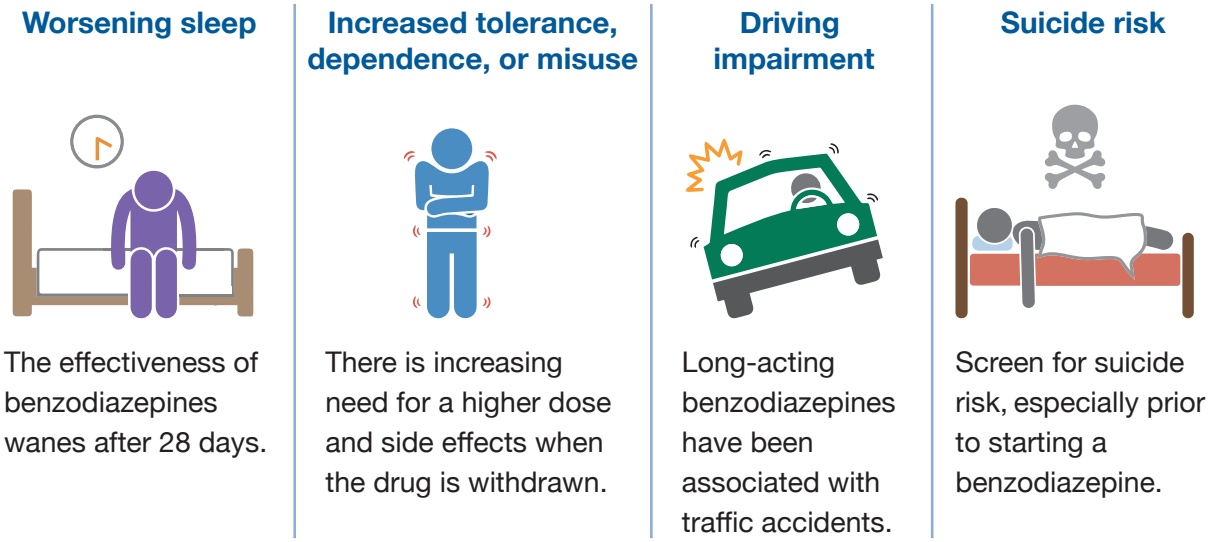
* Generics available for all classes except the DORAs as of April 2024. ✕ – avoid long-term use; ○ – use with caution and monitor for treatment limiting side effects; ● – not known to be unsafe in older adults, although all sleep medications can cause daytime drowsiness.

Reducing benzodiazepine and Z-drug use in insomnia

Benzodiazepines and Z-drugs are only recommended for short-term use (i.e., ≤4 weeks) which means clinicians should be prepared to help patients safely discontinue the medications, even if adverse effects are not present.

For patients who have been using benzodiazepines or Z-drugs for longer periods, the decision to taper or discontinue these medications should be tailored based on individual patient risks. A discussion with the patient about discontinuing a benzodiazepine or Z-drug should be undertaken if any of the red flags summarized in Figure 8 are present, or if there is evidence that the patient is using the benzodiazepine or Z-drug with non-prescribed central nervous system depressants (e.g., alcohol, opioids).

Figure 8. Red flags warranting discussion of benzodiazepine or Z-drug discontinuation



Stopping a benzodiazepine, or switching to another class of sleep medication, may be challenging for patients, particularly if they have used a benzodiazepine for a long time.[136] Psychological dependence is common for sleep medications of any type, but this dependence coupled with physical dependence can create patient resistance to change. Patients must be ready and motivated to change, hence clinicians must share relevant information (e.g., about the potential harms of benzodiazepines) and use non-judgmental, open-ended approaches such as motivational interviewing when discussing the possibility of reducing or stopping a benzodiazepine (Table 14).

Table 14. Increasing motivation to taper benzodiazepines[137]

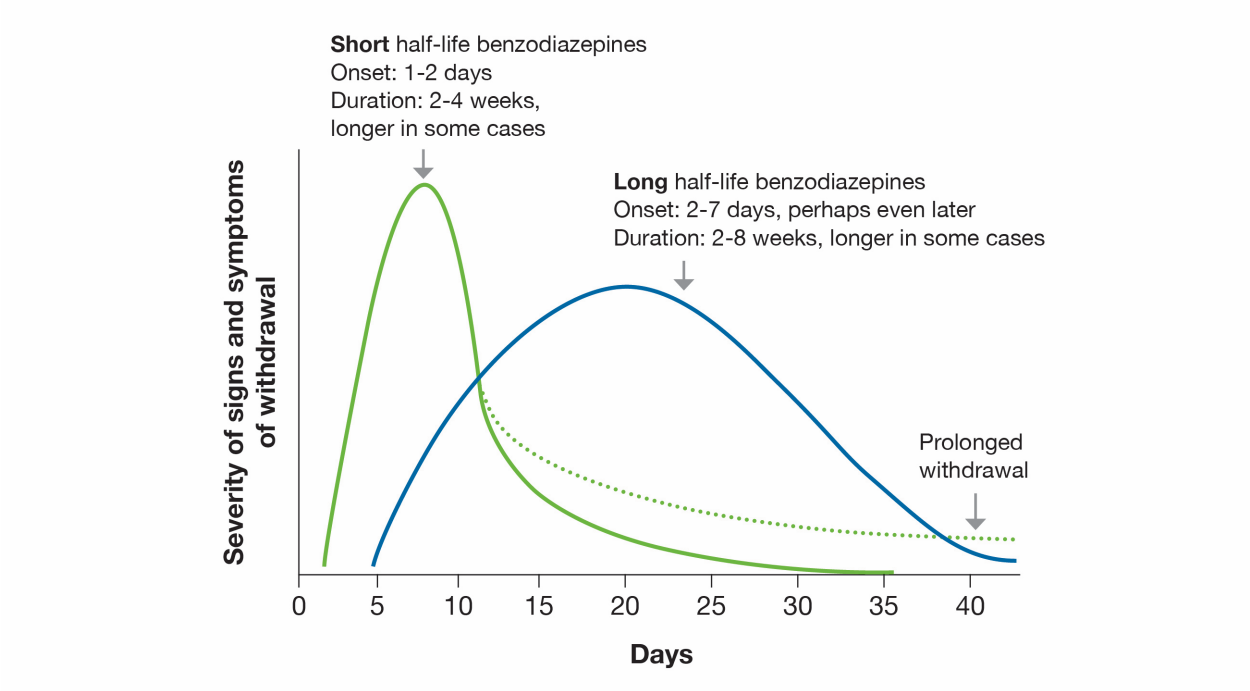
Action	Provider response
Express concern	• *"I would like to take a minute to discuss my concerns about (benzodiazepine name)."*
Provide education on potential risks	• *"Because of your [age or other risk factors], I am concerned that the use of (benzodiazepine name) may put you at increased risk for [relevant repercussion]."*
Assess patient's readiness to begin taper process	• *"What do you see as the possible benefits of stopping or reducing the dose? What concerns do you have about stopping? What can we do together to help address these concerns?* • If patient indicates no desire to change, provide information about potential risks. *"What would be a reason you might consider changing from (benzodiazepine name) to (name of recommended alternative)?"*
Negotiate the plan	• *"What changes are you willing to make to reach this goal?"* • *"Would you be willing to talk to one of my colleagues to learn about other options to support your changes?"*

Withdrawal symptoms (e.g., anxiety, dysphoria, dizziness, excitability) and rebound insomnia should be expected with discontinuation of a benzodiazepine, with such symptoms typically more likely when stopping short-acting benzodiazepines. Symptoms typically start 1-2 days after discontinuation of short-acting benzodiazepines and may last for days to weeks (Figure 9). Withdrawal and rebound insomnia typically start 2-7 days after stopping long-acting benzodiazepines.

Symptoms specific to benzodiazepine withdrawal:

- perceptual disturbances
- depersonalization, derealization
- hallucinations
- distortion of body image
- tingling, numbness
- sensory hypersensitivity (light touch)
- muscle twitches, jerks, fasciculation
- tinnitus

Figure 9. Course of benzodiazepine withdrawal[138]



Scales to assess withdrawal symptoms include:

- Benzodiazepine Withdrawal Symptom Questionnaire
- Clinical Institute Assessment of Withdrawal Benzodiazepines
- Physician Withdrawal Checklist
- Ashton Withdrawal Symptoms Rating Scale
- Composite Benzodiazepine Discontinuation Symptom Scale

Helping patients taper and stop benzodiazepines or Z-drugs

Primary care clinicians can help older patients taper and stop benzodiazepines regardless of whether they meet the formal criteria for benzodiazepine use disorder. In general, use the benzodiazepine the patient is already prescribed, support the taper with another strategy to treat insomnia (e.g., CBT-I or a less-risky medication such as a DORA, doxepin, or ramelteon), and select an appropriate taper strategy (see Table 15 below).

When planning a benzodiazepine taper consider how fast the taper should be, whether to taper the existing benzodiazepine or switch to a longer-acting benzodiazepine, and whether to use any adjuvant medications or interventions during the taper.

Z-drugs can usually be stopped more rapidly than benzodiazepines.[139] Patients taking a high dose or who have chronic use of Z-drugs can be tapered at a rate of 25% decrease every 7 days. Therapeutic doses of Z-drugs do not require a taper, although when these drugs are stopped patients should be advised to expect worse sleep on the first night, with improvements quickly thereafter.[139]

Historically, some clinicians recommended switching patients from a short-acting to a longer-acting benzodiazepine during a taper to help minimize side effects, but evidence suggests that this is not necessary. A 1991 study randomized 68 patients taking a daily dose of 2-16 mg of diazepam or

equivalent dose to either lorazepam (short-acting), bromazepam (short-acting), or diazepam (long-acting).[140] Patients were maintained on a stable dose for 4 weeks, then tapered by 25% every 2 weeks to discontinuation at 10 weeks. Few differences in withdrawal symptoms were observed between groups, although symptoms were worse if the patient had been taking the benzodiazepine for >5 years.

Taper schedules vary, and none have been compared in RCTs. The possible approaches are summarized in Table 15, with details following below:

Table 15. Benzodiazepine taper strategies

	Benefits	Challenges
Abrupt taper	None	**not recommended;** may result in withdrawal symptoms
Fast taper[141] (reduce dose by 25% of original dose each week)	• Shorter taper schedule (i.e., 1 month) • Reasonable success (46% stopped benzodiazepines)	Some people may have withdrawal symptoms
Symptom guided taper[142] (Variable taper duration based on patient factors)	• Minimizes withdrawal symptoms • **Most successful taper** (70% stopped benzodiazepines)	• Requires more frequent assessment of symptoms • Variable taper duration based on patient factors (may be weeks to months)
Partial dose taper (EMPOWER)[143] (tablet dose reduction on a set calendar schedule)	Clear protocol for patients and clinicians to follow	• Lengthy taper (may be months or more) • Less successful than symptom guided or fast taper (38% stopped or reduced dose)

Abrupt withdrawal of a benzodiazepine is not recommended once tolerance has developed because it exposes the patient to the consequences of a surge in excitatory nervous system activity and all of the withdrawal symptoms previously described, including rebound insomnia but also more potentially severe reactions such as convulsions or acute psychotic states.[114]

The **fast taper** approach was evaluated in the previously-described 2003 study that randomized patients who were unsuccessful in attempting to quit benzodiazepine use on their own to one of three groups: a tapering schedule of 25% reduction/week, that same tapering schedule with the addition of group CBT, or usual care.[141] At 3-month follow-up, 62% of the group using the 25%/week taper had successfully quit compared to 58% in the CBT group and 21% in the usual care group.

A 1987 study evaluated a **symptom-guided approach** to withdrawal in 50 patients seeking to quit their benzodiazepine use.[142] Patients were switched to an equivalent dose of diazepam and tapered on individually-tailored schedules (duration range 7 days to 15 months). Various drugs were used temporarily for symptom control (e.g., tricyclic antidepressants, cloridine, analgesics) and patients had frequent contact with clinicians who provided repeated encouragement. Outcomes were assessed at 10 months to 3.5 years after initiation of taper. One patient failed to achieve complete withdrawal, and three relapsed to benzodiazepine use. Of the total group, 48% were deemed to have an “excellent” outcome

(i.e., “fully recovered”) and 22% were deemed to be “much better” (i.e., they still had some symptoms but these did not interfere with their lives).

The **Eliminating Medications Through Patient Ownership (EMPOWER) trial** randomized 303 patients (mean age 75 years) currently using benzodiazepines (60% for insomnia) to an intervention consisting of an 8-page educational booklet presenting rationales for benzodiazepine discontinuation, a tapering schedule, and suggestions to talk to a prescriber or pharmacist, or to a wait list group.[143] After 6 months those in the intervention group had significantly higher rates of benzodiazepine discontinuation or dose reductions. The number-needed-to-treat for one patient to reduce or discontinue their benzodiazepine dose was 3.7.

Similar results were seen in a trial of patients aged ≥60 years with insomnia who were taking benzodiazepines or Z-drugs for at least three months.[144] Patients were randomized to receive either minimal intervention (i.e., an explanation of the dangers of long-term treatment with their prescribed drug), a “tapering down intervention” (TDI) group who received a table with a recommended tapering schedule, or a control group of matched patients who received no intervention. After 3 months the sedative medications were discontinued in 15.2% of the minimum intervention group, 27.3% of the TDI group, and 1.8% of the control group.

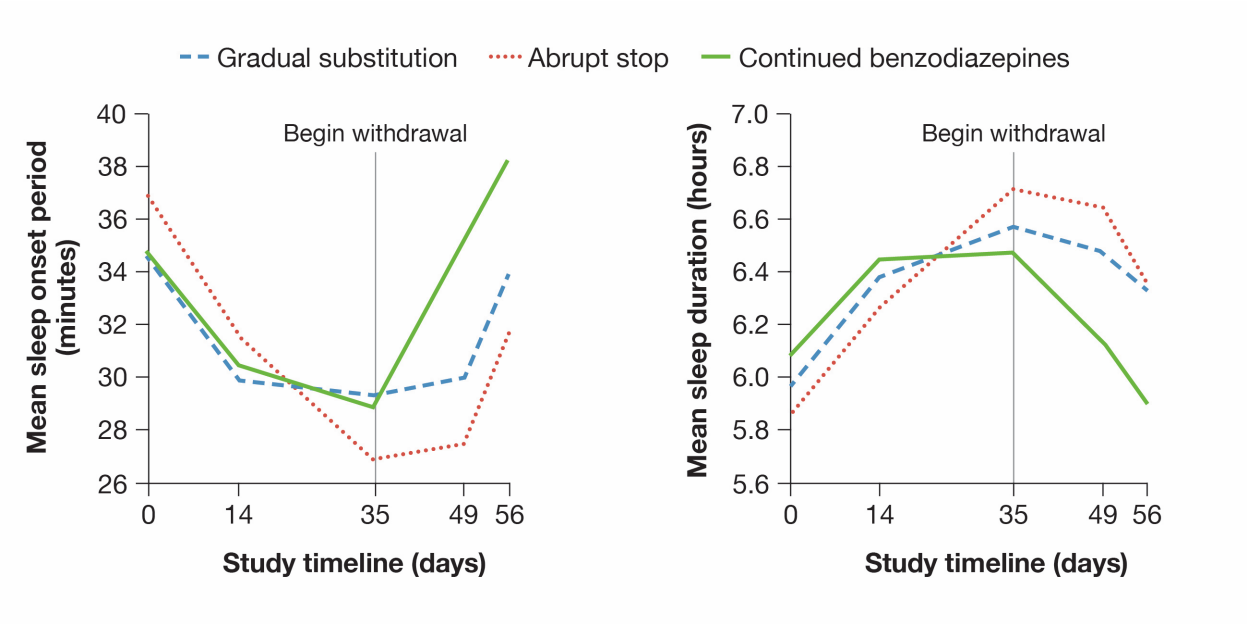
Taper with substitution

Adding a program of CBT-I to a tapering protocol appears to be more effective than a gradual taper alone, as evidenced by a meta-analysis of 8 trials (N=582) showing that combining CBT-I with gradual tapering of benzodiazepines over three months was more effective for stopping the drugs than gradual tapering alone (relative risk [RR] 1.68; 95% CI: 1.19-2.39), although the differences in effect sizes became insignificant after 12 months.[145] The group receiving the combined approach showed greater short-term improvement in their insomnia symptoms than the group getting gradual tapering alone (g -0.69; 95% CI: -1.09 to -0.28). A more recent study, however, came to a different conclusion. Voshaar and colleagues randomized 180 adults trying to discontinue long-term benzodiazepine use to a tapering protocol plus CBT-I, the tapering protocol alone, or usual care.[141] At three months, 58% of the group tapering with CBT-I had successfully discontinued, 62% of the group tapering without CBT-I were successful, and 21% of the usual care group were successful. Tapering, regardless of adjunctive CBT-I, was clearly superior to usual care (P=0.002).

Although a gradual benzodiazepine taper can reduce the severity of withdrawal symptoms, some patients experience distress or discomfort during withdrawal and the use of non-benzodiazepine adjunctive medications may address some of these concerns.

For example, transitioning to a Z-drug as a strategy for weaning off of a benzodiazepine may help reduce insomnia-related withdrawal symptoms during a taper. A trial of 1,022 adults (mean age 44 years) using benzodiazepines for insomnia were randomized to either a gradual substitution to zopiclone over 35 days; abrupt substitution of zopiclone for the benzodiazepine; or continuation with the benzodiazepine on a tapering schedule.[146] After 50 days patients in both zopiclone groups had less severe sleep-related symptoms than the group in the benzodiazepine group, and, after the withdrawal stage was completed, 18% in the gradual Z-drug switch group and 19% of the abrupt Z-drug switch group resumed benzodiazepine use, compared to 29% resumption in the benzodiazepine taper group (P<0.01) (Figure 10).

Figure 10. Z-drug substitution reduces sleep-related withdrawal symptoms during taper[146]



Benzodiazepine use disorder

The DSM-5 provides guidance to help primary care clinicians determine if a patient's pattern of use and their symptoms constitute a use disorder (Table 16). For patients meeting the DSM-5 criteria, referral to addiction treatment may be warranted (if available).

Table 16. DSM-5 criteria for benzodiazepine use disorder[147]

A problematic pattern of sedative, hypnotic, or anxiolytic use leading to clinically significant impairment or distress, as manifested by at least two of the following, occurring within a 12-month period:	
• Sedatives, hypnotics, or anxiolytics are often taken in larger amounts or over a longer period than was intended.	
• A persistent desire or unsuccessful efforts to cut down or control sedative, hypnotic, or anxiolytic use.	
• A great deal of time is spent in activities necessary to obtain the sedative, hypnotic, or anxiolytic; use the sedative, hypnotic, or anxiolytic; or recover from its effects.	
• Craving, or a strong desire or urge to use the sedative, hypnotic, or anxiolytic.	
• Recurrent sedative, hypnotic, or anxiolytic use resulting in a failure to fulfill major role or obligations at work, school, or home.	
• Continued sedative, hypnotic, or anxiolytic use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of sedatives, hypnotics, or anxiolytics.	
• Important social, occupational, or recreational activities are given up or reduced because of sedative, hypnotic, or anxiolytic use.	
• Recurrent sedative, hypnotic, or anxiolytic use in situations in which it is physically hazardous.	
• Continued sedative, hypnotic, or anxiolytic use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the sedative, hypnotic, or anxiolytic.	
• Tolerance: need for markedly larger doses to achieve effect, diminished effect at constant dose	Not included for patients taking a benzodiazepine, or other sedative, hypnotic or anxiolytic, as prescribed
• Withdrawal: characteristic withdrawal syndrome, use benzodiazepines to relieve withdrawal	

BOTTOM LINE: Benzodiazepine or Z-drug discontinuation is feasible with even minimal kinds of interventions. Tapering approaches that use symptom-guided approaches or the use of CBT-I as an adjuvant may increase the likelihood of success. Prognostic factors for success include short duration of use and an absence of psychiatric symptoms. Use of short-term, non-addictive medications for relief of withdrawal symptoms (e.g., anxiety, insomnia) may be helpful.

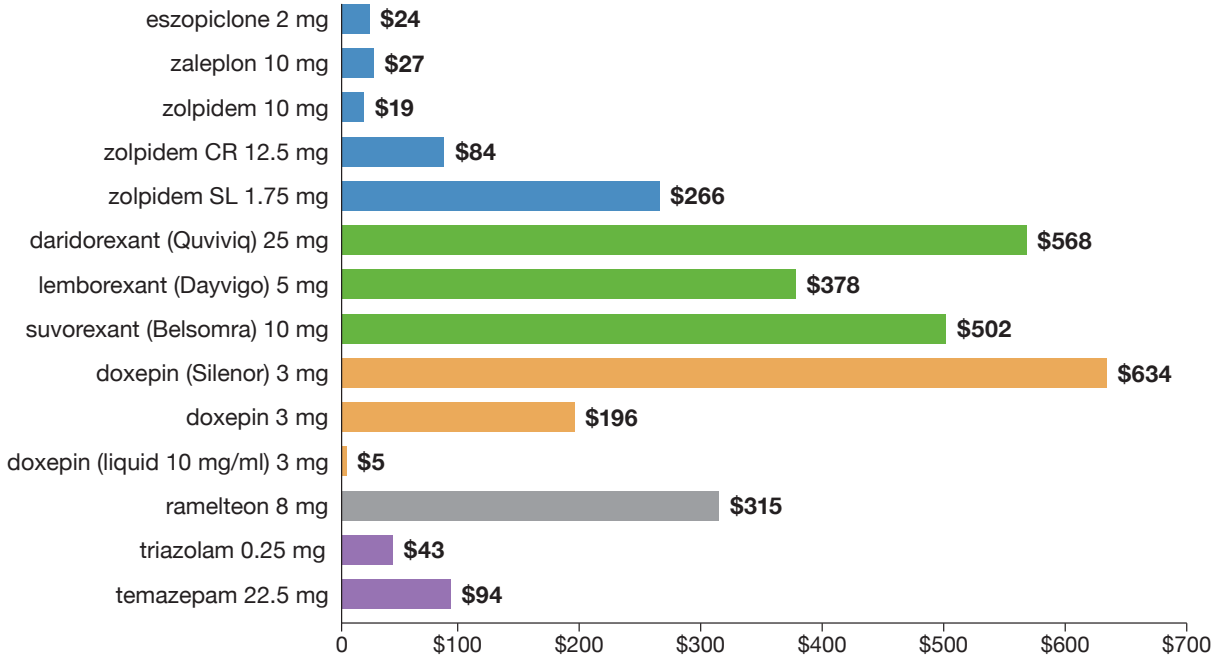
Putting it all together

Insomnia is a common complaint of older adults in primary care, and it can be challenging to assess and treat due to the complexity and diversity of factors that can interfere with sleep, ranging from environmental conditions to mental and physical illnesses. Non-pharmacological strategies to treat insomnia, specifically CBT-I, are recommended as first-line therapies by professional organizations because they are effective, durable, and have none of the side effects of many sleep medications, particularly benzodiazepines and Z-drugs. A range of digital CBT-I approaches are now available that can help overcome barriers such as lack of trained CBT-I providers or lack of geographic access.

If CBT-I is either not effective or is unavailable, dual orexin receptor agonists, doxepin, or ramelteon are pharmacologic agents with proven efficacy and more favorable side effect profiles in older adults compared to benzodiazepines and Z-drugs, which should be avoided due to increased risks for confusion, falls, fractures, impairments in activities of daily living, and cognitive dysfunction.

Discuss tapering and discontinuing benzodiazepines or Z-drugs whenever the risks of their use appear to outweigh the benefits of treatment. Use motivational interviewing techniques to clarify the patient's level of motivation to change and their expectations for the process of transitioning to either no medication or an alternative medication.

Appendix I: 30-day costs for insomnia medications



CR = controlled release; SL = sublingual

Prices from goodrx.com, January 2024. Listed doses are based on Defined Daily Doses by the World Health Organization, when available, or package inserts; they should not be used for dosing in all patients. All doses shown are generics when available, unless otherwise noted. These prices are a guide; patient costs will be subject to copays, rebates, and other incentives.

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About this publication

These are general recommendations only; specific clinical decisions should be made by the treating clinician based on an individual patient's clinical condition.

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