

CLINICAL REVIEW

The assessment and management of insomnia in primary care

Karen Falloon *PhD candidate*¹, Bruce Arroll *professor and head of department*¹, C Raina Elley *associate professor*¹, Antonio Fernando III *senior lecturer*²

¹Department of General Practice and Primary Health Care, University of Auckland, Private Bag 92109, Auckland 1142, New Zealand; ²Department of Psychological Medicine, University of Auckland

Insomnia affects about a third of the general population according to a recent longitudinal study in the UK¹ and cross sectional studies estimate the prevalence in patients attending primary care to be between 10% and 50%.^{2,3} According to the American Sleep Disorders Association International Classification of Sleep Disorders coding manual, insomnia refers to “a repeated difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate time and opportunity for sleep and results in some form of daytime impairment and lasting for at least one month.”⁴ Although some patients who have this problem may not report it as such, inadequate sleep has been associated with reduced physical health⁵⁻⁶ and mental health.⁷⁻⁹ The continued widespread use of sedative medication to treat insomnia raises concern about the potential for long term tolerance and addiction, particularly where insomnia is the presenting complaint of missed diagnoses such as depression, or when adverse effects might be a problem—for example, falls in older adults.¹⁰⁻¹² The normal range of sleep is seven to nine hours per night,¹³ although some individuals claim they can function on as little as four hours, whereas others need up to 10 hours. This article reviews the causes of insomnia and its treatment, focusing on the many non-drug options that may be suitable for use by general clinicians. This review is based on evidence from randomised trials for interventions and guidance from the American Academy of sleep medicine guidelines (www.aasmnet.org).

What is insomnia and who gets it?

Patients with insomnia may report difficulty with falling asleep, trouble staying asleep or frequent waking, waking too early and being unable to get back to sleep, or still feeling tired after waking up. As many as 40% of patients in primary care will report these symptoms if asked.² Insomnia is either primary, in which case no other contributing cause is present, or secondary, in which case it is caused or affected by an underlying condition (table 1). Patients can have more than one underlying diagnosis.

Depression and anxiety underpin insomnia in as many as half of cases and they frequently co-exist.² Physical health problems are also present in about a third of cases.² Excessive alcohol consumption and illicit drug use may also be associated with reports of poor sleep (about 8% and 6% of cases, respectively).² About 12% of those who report difficulty in sleeping have delayed sleep phase disorder, a circadian rhythm disorder in which the person has trouble getting to sleep at the time most people do.² They tend to go to bed very late and have difficulty in waking up when most others get up. People with insomnia function better on weekends when they can sleep late and wake up late. Obstructive sleep apnoea is a relatively common cause of sleep disturbance and can have a profound effect on daily functioning (box 1).

Sleep requirements may fall with age. A recent review summarises the literature on normal and abnormal sleep in older people.¹⁷ A mean sleep duration of seven hours per night was found among 1000 older adults interviewed in a French study.¹⁷ Another study found that total sleep time decreased on average by 27 minutes per decade from midlife to the eighth decade of life. Older people “spend more time in bed but have deterioration in both the quality and quantity of sleep.”¹⁷

How is insomnia diagnosed?

Taking a good history is important for diagnosing insomnia and identifying any underlying causes. Box 2 outlines the questions posed and information gained when asking about insomnia.

Considering secondary causes

Case finding for depression or anxiety using brief questions may identify an underlying mental illness.¹⁸⁻²⁰ Enquiry about other secondary causes shown in table 1 is warranted. For people with bipolar disorder, insomnia may herald a manic episode. Several tools are available for assessing depression and anxiety, including the patient health questionnaire (PHQ)-9, hospital

Correspondence to: B Arroll b.arroll@auckland.ac.nz

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Summary points

- Insomnia affects a third of people and is a common cause of consultation in primary care
- History is the main diagnostic tool
- There are many causes of secondary insomnia, which should be ruled out and treated first
- Excessive daytime sleepiness should raise questions about obstructive sleep apnoea
- Primary insomnia is diagnosed after excluding other causes of insomnia. It can be treated effectively by sleep hygiene techniques, by restricting time in bed, or with behavioural interventions
- Sedatives should be used as a last resort when other approaches have failed because of risks of tolerance and adverse effects

Sources and selection criteria

As well as using our personal reference collections, we searched the Cochrane database (www.cochrane.org), *Clinical Evidence* (<http://clinicalevidence.bmj.com>), and Best Practice (<http://bestpractice.bmj.com>). We also reviewed guidelines from the National Institute for Health and Clinical Excellence, the American Academy of Sleep Medicine, and the International Classification of Sleep Disorders. We selected systematic reviews and meta-analyses and when these were not available we used large randomised controlled trials.

Box 1 Obstructive sleep apnoea

- Affects about 9% of those reporting poor sleep in primary care²
- More common in people who are obese
- Episodic partial or complete upper airway obstruction is usually associated with oxygen desaturations in the blood and arousals from sleep
- Symptoms include chronic snoring, insomnia, gasping and breath holding, un-refreshing sleep, and daytime sleepiness. Be alert to this as a possible diagnosis if the patient reports falling asleep during the day including as a passenger in a car on short trips, in waiting rooms, or in lectures
- Bed partners may report the patient's snoring and gasping¹⁴
- If a patient answers yes to all or most of the following questions they will have a significant pre-test probability of obstructive sleep apnoea and will require further investigation and/or treatment.⁴ Do you: experience excessive sleepiness during the day?; experience frequent episodes of breathing pauses? (or gasping for air) during sleep. Or has someone told you that while you are asleep you: stop breathing?; snore very loudly? Do you: get morning headaches?; have a dry mouth on awakening?
- There may be a legal obligation for health professionals to advise professional drivers and machine operators of falling asleep at work.
- The diagnosis can be confirmed with polysomnography or nocturnal pulse oximetry.¹⁵
- The initial treatment is for patients to use a continuous positive airways pressure (CPAP) machine at night¹⁶; if this is unsuccessful consider surgical options. Level A evidence from meta-analysis supports CPAP.¹⁶

anxiety and depression scale (HADS-7), or PHQ-4.^{14 20 21} The alcohol use disorders identification test (AUDIT) or CAGE may be used to assess alcohol use^{22 23} and the alcohol, smoking and substance involvement screening test (ASSIST) to assess drug use.²⁴

Sleep diaries

General practitioners can make use of sleep diaries in which patients record their sleep pattern for one to two weeks; however, using them makes the consultation more involved. Several diary templates are available on the internet (for example, www.sleepeducation.com/pdf/sleepdiary.pdf). Sleep diaries can provide patients with insight into their actual sleep habits. They often reflect sleep trends, such as erratic schedules, or identify predominant sleep patterns, such as taking a long time to fall asleep, frequent awakenings, early morning awakenings, or a mixture. They can provide a starting point for the management of sleep problems in a personalised manner and can be used to monitor progress of certain treatments.

Physical examination

Although a physical examination cannot diagnose insomnia, it may be useful to help identify or exclude obvious underlying causes of sleep disorder such as obstructive sleep apnoea or a neurological condition such as Parkinson's disease. High body mass index (≥ 30) and neck circumference of 40 cm or greater increase the risk of obstructive sleep apnoea.²⁵ Usually the primary care doctor will be aware of other co-morbidities. Blood tests for hyperthyroidism and low ferritin levels, which can cause restless legs, may be warranted. A full blood count may rule out anaemia.

Polysomnography (overnight sleep study)

Patients can be referred for polysomnography to confirm sleep apnoea and limb movement disorders or restless legs syndrome. Polysomnography measures brain and muscle activity and assesses oxygen saturation overnight.

How can insomnia be managed in primary care without medication?

For all patients following the principles of basic sleep hygiene may be beneficial (table 2).

Secondary insomnia

For patients in whom a cause of the insomnia is identified (secondary insomnia) we recommend beginning with treatment of the underlying condition (see table 1). For all patients following the principles of basic sleep hygiene may be beneficial (table 2). In our experience patients may have several contributing diagnoses. Addressing some of these issues may solve other problems. For example, advising patients to reduce their use of drugs and alcohol along with treating pain or breathing difficulty may resolve depression and anxiety as well as improving the insomnia.

Delayed sleep phase disorder and parasomnias

The use of melatonin at night and light boxes in the morning are helpful; at least two randomised trials have shown a benefit for those with delayed sleep phase disorder.^{26 27}

For most cases of restless legs, non-drug treatments such as massage, exercise, stretching, and warm baths before bedtime are recommended.²⁸ For more severe cases, non-ergot dopamine antagonists are recommended, on the basis of evidence from randomised controlled trial.²⁸ Advice should be sought for other parasomnias, such as sleep walking and other nocturnal behaviours that are not common in primary care (box 3).

Primary insomnia

About 30% of patients with primary insomnia will improve with basic sleep hygiene alone (table 2).²⁹

Restriction of time in bed

Recommendations developed and published by the American Academy of Sleep Medicine in 2006 have concluded from the available evidence that psychological and behavioural interventions are effective in the treatment of chronic primary insomnia.³⁰ Empirically-supported treatments include: cognitive behavioural therapy, bedtime restriction (sleep restriction), stimulus control therapy, relaxation training, and paradoxical intention (instructions to remain passively awake and avoid any effort to sleep).³¹

Cognitive behavioural therapy has been shown to be an effective treatment for insomnia in meta-analyses of randomised trials.^{32 33} It aims to address the various cognitive and behavioural aspects of insomnia using a combination of interventions such as behavioural strategies (such as bedtime restriction, stimulus control therapy, and relaxation), education (for example, about sleep hygiene), and cognitive strategies (cognitive therapy). Importantly, it is not designed to be administered by a general practitioner (typically administered in six to eight sessions, as shown in a randomised controlled trial)³⁴ and thus it remains underused in primary care. Therefore, a simple starting point for treatment of primary insomnia is to address sleep hygiene and to try a behavioural intervention such as bedtime restriction or stimulus control.

Bedtime restriction involves curtailing time spent in bed to closely match actual time spent asleep (box 4).³⁵ Evidence from a randomised controlled trial suggests that this method is effective for some patients with primary insomnia.^{w1} Restricting

time in bed often forms part of cognitive behavioural therapy interventions. This is potentially a very simple treatment that can be used in primary care and is useful for people who spend a lot of time in bed but not sleeping.

Stimulus control refers to a set of instructions designed to reassociate the bed and bedroom with sleep and re-establish a regular sleep-wake routine (box 5).^{w2}

What is the role of medication in primary insomnia?

Hypnotic drugs are often used to manage insomnia in general practice.^{w3} Different classes of sleep medications are prescribed (table 3) or purchased over the counter (for example, sedating antihistamines, melatonin, and natural supplements such as valerian), although this approach is not evidence based as a treatment of chronic insomnia.^{w4 w5} Recent reviews have shown that pharmacotherapy and psychological or behavioural interventions result in similar short term (up to four weeks) improvements, but that psychological and behavioural treatments have persisting benefits that can also improve with time.^{w4 w5} Furthermore, the use of sleep medication as monotherapy may not result in the quality of sleep that can be achieved by other methods and may not deal with the underlying sleep problem. A randomised comparison between zopiclone and cognitive behavioural therapy found better sleep efficiency in the cognitive behavioural therapy group, along with fewer awakenings.^{w6} The total sleeping time did not differ between the groups.

A high level of suspicion is warranted if an unknown or new patient asks for a hypnotic by name because he or she may want the drug for illicit purposes. The discussion about sleep medications will depend on whether the clinician or the patient raises medication as an option. Patients who raise the matter must be informed of the benefits of non-drug based treatment. They may eventually need drugs, but optimal practice should include a trial of non-drug based treatment. If the clinician raises the matter then presumably the patient has completed a trial of non-drug treatment or the situation is extreme and urgent.

Concerns about hypnotics

Hypnotic drugs (benzodiazepines or “z-drugs” such as zopiclone) are associated with perceived tolerance, dependence, and withdrawal syndrome and with “rebound insomnia” on cessation.^{w7-w9} They can also have side effects, and in rare cases can be associated with unusual sleep behaviours (such as “sleep driving” or making phone calls, with no remembrance of the events), especially if taken with alcohol.^{w8} There is also the risk of misuse—hypnotics can enhance the “high” from other drugs^{w9} and have been used in overdose attempts. Further problems include drug interactions, issues around driving under the influence of psychotropics, and potential risks when prescribing to the elderly (falls, cognitive impairment, and fatigue).^{w10}

Despite these potential problems, benzodiazepine receptor agonists are often prescribed for insomnia.^{w11} Tolerance and dependence are common concerns despite the contradictory evidence in many clinical studies. A six month double blind placebo controlled study of eszopiclone in hundreds of patients showed sustained response and no tolerance.^{w12} Benzodiazepines have been consistently shown to improve sleep latency and increase total sleep time,^{w11} and they have significantly fewer side effects than sedating antidepressants and sedating antipsychotics.^{w13} Shorter acting benzodiazepines (zolpidem, triazolam) are preferred for insomnia with delayed sleep latency (long onset of getting to sleep). Medium acting ones like

temazepam and zopiclone are preferred for patients who wake in the middle of the night. Long acting drugs like clonazepam are preferred for patients with insomnia and daytime anxiety. To limit the risk of dependence or tolerance, prescribers can tell patients to use benzodiazepines “as needed,” with a maximum frequency per week (no more than three nights).

Non-benzodiazepine drugs used as hypnotics

Sedating antidepressants and sedating antipsychotics generally do not result in physical dependence, tolerance, or misuse. Because of this, many doctors prefer to prescribe these groups of drugs instead of benzodiazepines. This is despite their common adverse effects including daytime sedation, weight gain, and anticholinergic side effects. Sedating antidepressants are more toxic than benzodiazepines in overdose. There is also less evidence for the efficacy of sedating antidepressants than benzodiazepines in insomnia. Sedating antipsychotics also carry the risk of tardive dyskinesia and weight gain. Sedating antidepressants may be useful if there are anxious or depressive components to the clinical picture.

Melatonin is a pineal hormone that is naturally secreted during darkness. It is thought to signal sleep onset and has some sleep promoting effects. However, most clinical trials have shown that exogenous melatonin is not effective in primary insomnia,^{w14} although it does affect the circadian rhythm and is used to treat insomnia caused by jet lag,^{w15} circadian rhythm disorders, and shift work.

Although drugs have their place, they should be considered only in patients who do not improve after cognitive behavioural therapy or other non-drug based interventions.

When and to whom to refer?

If any uncertainty exists about the diagnosis or if any safety concerns have been identified (such as excessive daytime sleepiness or parasomnias causing injuries) referral to and assessment by a sleep specialist is indicated. If a sleep specialist is unavailable, discussion with neurology, general medical, or psychiatry services may help determine the appropriate avenue for referral.

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Tables

Table 1 | Secondary causes of insomnia and appropriate treatments

Secondary cause	Treatment
Depression	Treat depression (for example, antidepressants, cognitive behavioural therapy)
Anxiety	Treat anxiety (drug or cognitive behavioural therapy)
Physical health problem (such as pain or dyspnoea)	Treat pain and other symptoms
Obstructive sleep apnoea	Continuous positive airways pressure or devices to improve airway (such as mandibular advancement splint in mild cases); consider referral to a respiratory doctor or sleep physician
Excess alcohol	Interventions to reduce alcohol intake or promote abstinence
Delayed sleep phase disorder (a circadian rhythm disorder)	Change work hours; melatonin in the evening and light exposure (via sunlight or artificial light box) in the morning
Illicit drug use	Interventions to reduce drug use
Parasomnias (restless legs, sleep talking, sleep walking, sleep terrors, periodic limb movements, bruxism (teeth grinding), nightmare disorder, sleep related eating disorder, sleep sex)	For restless legs check ferritin, consider non-drug based measures or non-ergot dopamine antagonist drugs for severe cases; for other parasomnias consider referral

Table 2| "Sleep hygiene" instructions and rationale

Instruction	Rationale
Limit use of caffeine to 1 cup of coffee in the morning (if at all), avoid alcohol and cigarettes at night, and limit other substances that can affect sleep	Caffeine and nicotine are stimulants that can delay sleep onset and impair sleep quality; people vary in their ability to metabolise these substances from their system; some people use alcohol to help them get to sleep because it relaxes them, but it may cause awakenings and reduce sleep quality later in the sleep period
Avoid going to bed until you are drowsy and ready to sleep	People do not fall asleep if their brain is wide awake, so going to bed before they are sleepy leads to frustration at not being able to sleep, which can further delay sleep onset; people's sleep patterns and needs may not match those of their bed partners
Avoid napping during the day	Napping reduces the "sleep pressure" that builds up during the day to the point where a threshold is reached and we are ready to sleep; napping may delay the time of readiness for sleep and lead to erratic bedtimes, especially if the person can sleep in to compensate for a later bedtime (leading to a "domino" effect for the day after); if naps have been taken during the day, and the "usual" bedtime is kept, sleep onset may be delayed, leading to frustration and anxiety, which further prolongs sleep onset
Regular daily exercise can help improve sleep, but avoid exercise late in the evening	Exercise too close to a sleep period can serve as an arousal stimulus, delaying sleep onset
Ensure that the bedtime environment is comfortable and conducive to sleep	The bed should be comfortable, the temperature not too hot or cold, the room dark, and noise minimised; discomfort, being too hot or cold, noise, and light can disrupt sleep
Think about computer screens, clocks, and co-sleepers	Looking at a computer screen in the hours before bed may delay sleep onset (the light waves emitted are thought to reduce the production of melatonin, a hormone that is secreted by the pineal gland to promote sleep); looking at a clock during awakenings can delay sleep onset by contributing to frustration at being awake (lit clocks may also contribute arousal stimuli to the brain); if co-sleepers are disturbing sleep (by excessive movements or snoring) they probably warrant their own assessment for sleep disorders
If not asleep within 15-20 minutes, get out of bed and return only when drowsy	The thought behind this idea is that bed needs to be associated with being asleep not with being awake and having difficulty getting to sleep

Table 3| Drugs commonly used for insomnia

Drug	Class	Usual hypnotic dose	Half life	
Temazepam	Benzodiazepine receptor agonist	10-20 mg	5-15 hours ^{w16}	Sedation, confusion, amnesia, impaired coordination, disinhibition
Triazolam	Benzodiazepine receptor agonist	0.125-0.25 mg	2-3 hours ^{w16}	Same as above
Zolpidem	Benzodiazepine receptor agonist	5-10 mg	1.5-2.4 hours ^{w11}	Same as above
Zopiclone	Benzodiazepine receptor agonist	7.5 mg	5-6 hours ^{w11}	Same as above
Doxepin	Sedating antidepressant	25-50 mg	8-24 hours ^{w11}	Sedation, falls, dizziness, dry mouth (and other anticholinergic side effects) headache, nausea, lightheadedness
Quetiapine	Sedating antipsychotic	25-200 mg	6 hours ^{w11}	Sedation, weight gain, hypotension
Promethazine	Sedating antihistamine	10-20 mg	5-15 hours ^{w16}	Sedation, urinary retention, dizziness

Box 3 Parasomnias (neurological conditions, rare in primary care)

Restless legs syndrome
Sleep talking
Sleep walking
Sleep terrors
Periodic limb movements
Bruxism (teeth grinding)
Nightmare disorder
Sleep related eating disorder
Sleep sex

Box 4 Bed time restriction for primary insomnia

- Ensure the diagnosis is most likely to be primary insomnia (no other conditions)
- Advise workers who drive vehicles or operate heavy machinery to consider treatment during their vacation, because there is a short term risk of sleep deprivation
- Estimate time spent in bed versus time spent asleep, with use of a sleep diary if necessary. A common scenario is that a patient stays in bed around 8-9 hours but only sleeps for a total of 6 hours. Advise the patient to restrict their total time in bed to their estimated total sleep time. We find it best for the patient to get up at the usual (household) time and go to bed later. For example, if the usual getting up time is 0600, suggest that they go to bed at 2400 instead of their usual 2200. Advise the patient to do only quiet, relaxing activities before bedtime. These activities have to be done outside of bed and not lying down to avoid naps, which can disrupt the routine. We recommend patients keep their bedtime allowance for two weeks before making any adjustments. The patient usually reports that the quality of their sleep improves as they feel they are starting to have deep sleep and the sleep period is consolidated.
- After two weeks:
 - If the patient is sleeping better and functioning well nothing else is needed. Many patients prefer to continue on the bed restriction schedule as they find it very effective
 - If they are sleeping better but feel sleep deprived the next day they may wish to add 30 minutes to their time allowed in bed every week and continue doing so until the feelings of sleep deprivation disappear, while still maintaining continuous sleep at night
 - If they are not sleeping better, they may wish to reduce their time in bed by 30 minutes (but not to less than five hours at night). Ensure that the patient tries each option for at least two weeks before making another change. If they are not sleeping better on five hours per night you may wish to get some advice from a sleep specialist
- The bedtime allowance is never set at less than the estimated average time spent asleep or five hours (whichever is longer)

Box 5 Stimulus control instructions

- (1) Go to bed only when sleepy
- (2) Get out of bed if unable to sleep after 15-20 minutes, returning to bed only when sleepy (repeat as necessary)
- (3) Use the bed/bedroom only for sleep
- (4) Arise at the same time each day
- (5) No naps