

# HOW TO TREAT

## insomnia

Poor sleep has been associated with reduced mental and physical health, but it is essential to determine which one is the cause and which the result. Effective therapy can begin only once a diagnosis has been made. This article provides an algorithmic approach to finding the cause of insomnia through history taking and a review of drug and non-drug treatments. It was written by **Bruce Arroll**, Professor and Elaine Gurr Professor of General Practice, Department of General Practice and Primary Health Care, University of Auckland, Auckland.

## Function next day as important as hours slept

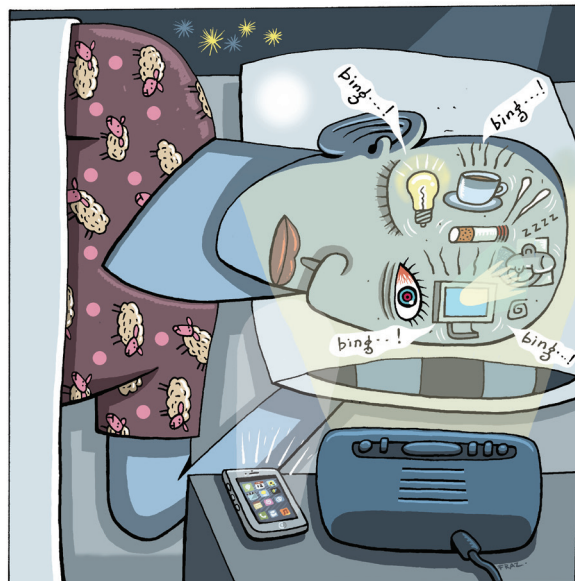
“We are living in an age where sleep is more comfortable than ever and yet more elusive,” says US journalist and author of *Dreamland*, David K Randall.

Insomnia affects 42 per cent of patients presenting to primary care teams in New Zealand, when using a definition of having trouble sleeping on at least three nights per week for the past month. A rate of 10 per cent was found by GE Simon and M VonKorff (1997) using a definition that required people to have two or more hours of difficulty in getting to sleep.

The International Classification of Sleep Disorders coding manual (from the American Academy of Sleep Medicine) refers to insomnia as “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”.

Poor sleep has been associated with reduced mental and physical health. There is a wide range of “normal” sleep durations, ranging from four to 10 hours. The key issue is not how much sleep a person gets but how they function the next day.

Patients may feel they have slept poorly but are able to function well the next day without needing naps. Those with poor



sleep are more likely to become depressed in the future. Excessive daytime sleepiness needs to raise the question of obstructive sleep apnoea (OSA) especially in those who drive for a living or drive long distances. A good source of evidence on sleep treatments can be found at the American Academy of Sleep Medicine website ([www.aasmnet.org](http://www.aasmnet.org)).

The long-term use of sedatives raises concerns in regard to falls in the elderly. There is

also the concern sedatives may mask depression and prevent patients from getting adequate treatment.

Primary insomnia is a significant cause of insomnia and can be treated with a number of non-drug methods as well as with medication. Non-drug treatments for “insomnia” include educating the patient about sleep hygiene and changing their expectations about how much sleep they need. One of the treatments for primary insomnia is reducing the time spent in bed, which is very effective.

There are many common causes of secondary insomnia (Panel 1), which need to be ruled

out and treated before considering primary insomnia (see later for screening questionnaire).

Taking a history is the main way to make a diagnosis. You cannot treat insomnia without a diagnosis and this article also provides an algorithm to assist with this.

This article also hopefully results in a lowering of the use of sedatives, but for some people that is the final option.

# History at the centre of insomnia diagnosis

Almost all common causes of insomnia can be diagnosed by history.

To confirm primary insomnia, it is necessary to exclude potential secondary causes with structured questioning (Figure 1) and validated screening tools where indicated (Table 1). Management for improving the patient's sleep is determined by the underlying cause or type of insomnia (Table 2).

Physical examination is of limited usefulness. Body mass index is worth checking for someone with OSA. Ear nose and throat specialists may examine the pharynx for structural causes of OSA.

There is no need for blood testing in the absence of comorbidities, of which GPs will be aware. A thyroid-stimulating hormone level may be useful in OSA and a serum ferritin test may be useful in restless leg syndrome.

A sleep diary may be useful to determine just how much time patients are spending in bed versus how much time they are actually asleep. Samples can be found online by searching for "sleep diary".

Overnight pulse oximetry can be useful for confirming OSA. Patients can be referred for polysomnography to confirm apnoea and limb movement disorders or restless leg syndrome. Polysomnography measures brain and muscle activity and assesses oxygen saturation overnight and confirms restless leg and some rare neurological conditions.

## CATEGORISING INSOMNIA: PRESENTATIONS IN PRIMARY CARE\* PANEL 1

- ▶ depression/anxiety (about 50 per cent)
- ▶ delayed sleep phase (2 per cent)
- ▶ drugs/alcohol (more than 8 per cent)
- ▶ do not sleep well (primary insomnia) (12 per cent)
- ▶ obstructive sleep apnoea (9 per cent)
- ▶ narcolepsy (very rare in primary care; consider referral)
- ▶ parasomnias, eg, restless leg (2 per cent)\*\*
- ▶ sleep walk (1 per cent)
- ▶ sleep talk (significance unclear)
- ▶ teeth grinding (significance unclear).

\* All overlap except for delayed sleep phase disorder and primary insomnia, which are mutually exclusive.

\*\* Unclear how precise this figure is.

**Diagnosis of the causes of insomnia** TABLE 1

Condition	Definition or screening tool
Depression	Patient Health Questionnaire score $\geq 10$ <sup>1</sup>
Anxiety	Generalised Anxiety Disorder score $\geq 8$ <sup>2</sup>
Obstructive sleep apnoea	Having four or more of: <ul style="list-style-type: none"> <li>▶ excessive daytime sleepiness</li> <li>▶ pauses in between breaths during sleep</li> <li>▶ morning headache</li> <li>▶ dry mouth</li> <li>▶ loud snoring.</li> </ul> (First two features must be present.)
Delayed sleep phase disorder	All of the following required: <ul style="list-style-type: none"> <li>▶ considers self to be an evening person</li> <li>▶ chooses to go to bed late and wake up late</li> <li>▶ has no medical problem, mood disorder, substance problem, breathing disorder or other sleeping disorder</li> <li>▶ goes to bed after midnight.*</li> </ul>
Parasomnias	<ul style="list-style-type: none"> <li>▶ reported sleep walking</li> <li>▶ started before being a teenager</li> <li>▶ difficulty arousing during episode and no subjective awareness or occurring three or more times a week causing disturbance to bed partner and no subjective awareness of episode</li> <li>▶ reported teeth grinding and abnormal wear of teeth, sounds associated with grinding or jaw muscle discomfort occurring three or more times a week</li> <li>▶ restless legs: unpleasant sensations (aches, pains or creeping) in legs affecting sleep, relieved by movement or rubbing occurring three or more times a week.</li> </ul>
General health problem	Significant health problems affecting ability to sleep well occurring three or more times a week.
Alcohol problem	CAGE score $\geq 3$ <sup>3</sup>
Other substance problem	Reported drugs affecting sleep or quality of sleep.
Primary insomnia	Reported sleep problem but none of the diagnosable disorders above (see Figure 1).

1. Patient Health Questionnaire (<http://bit.ly/mZw2zn>).

2. Generalised Anxiety Disorder Seven-Item Scale (<http://bit.ly/XPp4L8>).

3. CAGE questionnaire (<http://bit.ly/kAOYZ>).

\*Author's criterion as none is specified in the international classification manual.

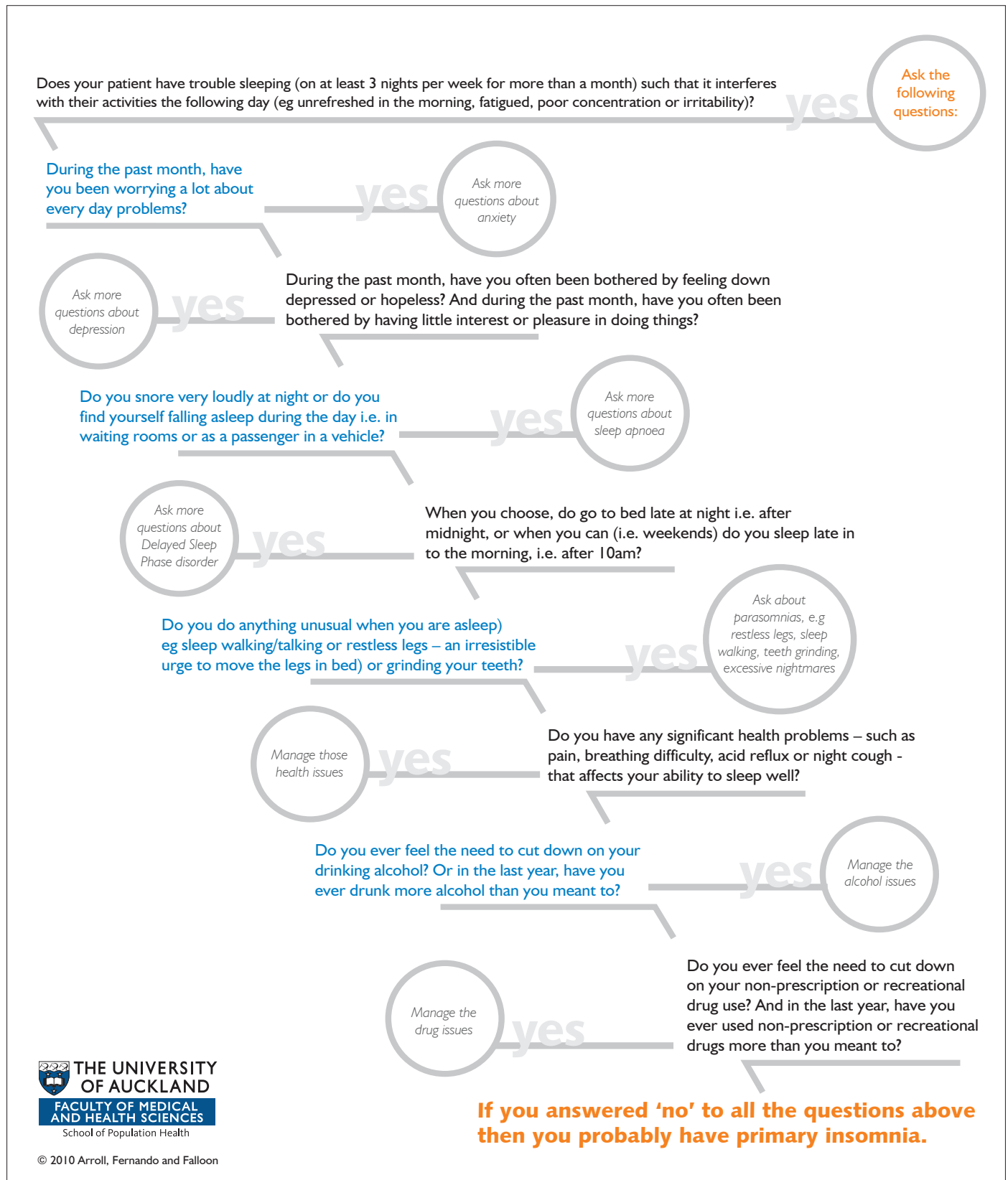


Figure 1. Algorithm to exclude potential secondary causes of insomnia through structured questioning.

# What is the role of medication in primary insomnia?

Hypnotic drugs are often used to manage insomnia in general practice and it could be argued GPs may be too quick to reach for the prescription pad. There are medications that can be prescribed or obtained over the counter, eg, sedating antihistamines, melatonin (needs a prescription in New Zealand) and “natural” substances such as valerian.

Recent reviews have shown pharmacotherapy and psychological or behavioural interventions result in similar short-term improvements (up to four weeks), but psychological and behavioural treatments have persisting benefits that can also improve with time.

The discussion about sleep medications

will depend on whether the GP or the patient raises medication as an option. Patients who raise the matter must be informed about non-drug based treatment. A trial of non-drug based treatment should be tried first but the patient may ultimately need medication. GPs must always be aware of drug seekers, as hypnotics have a street value.

### Concerns about the use of hypnotics

Hypnotic drugs (zopiclone or benzodiazepines) are associated with dependence, tolerance, withdrawal syndrome and with “rebound insomnia” when stopped. There is also the risk of misuse – hypnotics can enhance the “high” from other drugs and have been

used in overdose attempts. There can also be issues around driving and falls in the elderly.

The benzodiazepines have been consistently shown to improve sleep latency (reduce time taken to fall asleep) and increase total sleep time, however.

Shorter-acting benzodiazepines (eg, triazolam) are preferred for patients with insomnia with delayed sleep latency (long onset of getting to sleep). Medium acting benzodiazepines (eg, temazepam, zopiclone) are preferred for patients who have insomnia in the middle of the night.

### Non-benzodiazepine drugs used for insomnia

Sedating antidepressants and sedating antipsychotics generally do not result in physical dependence, tolerance or misuse. Hence, many GPs prefer to prescribe these groups of drugs instead of benzodiazepines. This is despite their common adverse effects, which include anticholinergic side effects, daytime sedation and weight gain. There are also safety issues with the sedating antidepressants in overdose.

There is limited evidence for the efficacy of sedating antidepressants compared with benzodiazepines in insomnia. Sedating antidepressants may be useful if there are anxious or depressive components to the clinical picture.

Sedating antipsychotics also carry the risk of tardive dyskinesia and weight gain.

Melatonin is naturally secreted during darkness. It is thought to be a signal for sleep onset and has some sleep-promoting effects. There is contradictory evidence over its effectiveness in primary insomnia although it does affect the circadian rhythm and is used to treat insomnia caused by jet lag and shift work. It has no obvious adverse effects and, hence, a trial of it is reasonable.

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

**Treatment for the causes underlying insomnia** TABLE 2

Condition	Management
<b>Sleep hygiene is important for all conditions</b>	
<b>Depression</b>	<ul style="list-style-type: none"> <li>▶ Consider sedating antidepressants such as tricyclic antidepressants or mirtazapine.</li> <li>▶ Can also add benzodiazepines for six weeks.</li> <li>▶ There are also many non-drug therapies such as cognitive behavioural therapy and problem solving.</li> </ul>
<b>Anxiety</b>	<ul style="list-style-type: none"> <li>▶ As for depression.</li> <li>▶ Some clinicians prefer not to use benzodiazepines in case of addiction.</li> </ul>
<b>Obstructive sleep apnoea</b>	<ul style="list-style-type: none"> <li>▶ Continuous positive airway pressure (CPAP) devices, which patients can hire or buy.</li> <li>▶ Usually, this requires referral for overnight pulse oximetry or a sleep study.</li> </ul>
<b>Delayed sleep phase disorder</b>	Oral melatonin at night and light box use in the morning.
<b>Parasomnias</b>	<ul style="list-style-type: none"> <li>▶ Exercise may help restless leg syndrome (RLS) but ropinirole given once daily before bedtime reduces RLS severity (starting dose 0.25mg, maximal dose 4mg).</li> <li>▶ Sleep walking necessitates ensuring the house is safe and referral to a specialist is warranted.</li> </ul>
<b>General health problem</b>	Address pain, shortness of breath, dyspepsia, etc.
<b>Alcohol problem</b>	Alcohol reduction or abstinence.
<b>Other substance problem</b>	Substance use reduction or abstinence.
<b>Primary insomnia</b>	Time in bed restriction (see later); melatonin, hypnotics.

# Sleep hygiene, stimulus control and bedtime restriction



Sleep hygiene is important for improving insomnia, whatever the condition causing it. It requires attention to a number of daytime and night-time aspects of lifestyle and home environment. Stimulus control refers to a set of instructions designed to re-associate the bed and bedroom with sleep and re-establish a regular sleep-wake routine (Panel 2).

## Sleep hygiene: reduce stimulant consumption

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

### STIMULUS CONTROL INSTRUCTIONS PANEL 2

- ▶ go to bed only when sleepy
- ▶ get out of bed if unable to sleep after 15 to 20 minutes, returning to bed only when sleepy (repeat as necessary)
- ▶ use the bed/bedroom only for sleep
- ▶ arise at the same time each day
- ▶ no naps.

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use alcohol to facilitate sleep onset as it causes relaxation, but it may also cause awakenings and reduce sleep quality later in the sleep period.

The patient should be advised to limit their use of caffeine, alcohol, cigarettes and other substances that can affect sleep. Limit caffeine to one cup in the morning, if at all, and avoid alcohol and nicotine at night.

## Sleep hygiene: go to bed only when drowsy

A person will not fall asleep if their brain is wide awake. Going to bed before you are sleepy leads to frustration at not being able to sleep, which can actually further delay sleep onset. Also, a person's sleep patterns and need for sleep may not match those of their bed partner. The correct advice is to avoid going to bed until drowsy and ready to sleep.

## Sleep hygiene: avoid daytime naps

Napping reduces the "sleep pressure" that builds 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 leading to erratic bedtimes, especially if one is able to sleep in late 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

## CASE STUDY 1

### Awake for two hours during night

#### Presentation and history

Evelyn, a 77-year-old woman of European descent, presents with a history of going to bed at 9pm, waking for two hours in the middle of the night, then falling asleep and, finally, waking at 6am. She has no other reasons for this drowsiness.

#### Examination

Her BMI is 27, which is overweight for someone of her ethnicity.

#### Diagnosis

Primary insomnia (ie, spending too much time in bed).

#### Treatment

Evelyn is advised to try bedtime restriction, as she is only sleeping for six hours, and starts going to bed later (ie, about midnight).

"usual" bedtime is kept, sleep onset may be delayed leading to frustration and anxiety, further prolonging sleep onset.

## Sleep hygiene: take regular daily exercise

Regular daily exercise is helpful in improving sleep, but not exercise late in the evening. Exercise too close to a sleep period can serve as an "arousal" stimulus, delaying sleep onset.

## Sleep hygiene: ensure a bedroom conducive to sleep

Ensure the patient creates a bedtime environment that is comfortable and conducive to sleep. The patient should make sure the bed is comfortable, the temperature comfortable, the room dark and noise minimised. Discomfort, being too hot or cold,

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CASE STUDY 2

Man falls asleep at work

Presentation and history

Sunil, a 53-year-old man (born in India and of South Asian ethnicity), presents with a two-year history of awaking feeling unrefreshed and of falling asleep at work. It was so severe he had to be woken up by his colleagues. He snores at night and his wife notes he stops breathing. He had headaches when he awakes and a dry mouth. Sunil has no other reasons for his drowsiness.

Examination

His BMI is 26, which is overweight for someone of his ethnicity.

Diagnosis

Sunil meets all five criteria for obstructive sleep apnoea.

Treatment

Continuous positive airway pressure (CPAP) treatment is discussed with Sunil but he is reluctant to pay for it himself, so he is referred to the hospital where he has overnight polysomnography, which confirms obstructive sleep apnoea.

Outcome/follow-up

He is supplied with a CPAP machine and finds he now awakes feeling refreshed. His wife is not bothered by the CPAP machine in the bedroom and is pleased he no longer stops breathing at night.

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noise and light can disrupt sleep. If a bed partner is disturbing sleep (eg, excessive movement or snoring), that person probably warrants their own assessment for sleep disorders.

Sleep hygiene: reduce electronic stimuli

Looking at a computer screen in the hours before bed may delay sleep onset (the light emitted is thought to reduce the production of melatonin, the hormone secreted by the pineal gland to promote sleep). Looking at a bedroom clock during awakenings may delay sleep onset by contributing to the frustration at being awake (lit clocks may possi-

bly contribute arousal stimuli to the brain). Advise the patient to think about removing computer screens and lit clocks from the evening environment.

Bedtime restriction: for primary insomnia only

Bedtime restriction is a graduated schedule of permitted bedtime aimed at maximising the proportion of time spent sleeping in relation to the time spent in bed (sleep quality). Once improved sleep quality is achieved, adjustments may be made to try to improve the quantity of sleep.

It is important to ensure the diagnosis is most likely to be primary insomnia (no other conditions).

Advise workers who drive vehicles or operate heavy machinery to consider bedtime restriction treatment during their vacation, because there is a short-term risk of sleep deprivation.

Initiating bedtime restriction as treatment (weeks 1 and 2)

Estimate time spent in bed versus time spent asleep, using a sleep diary if necessary. (A common scenario is the patient stays in bed for around eight to nine hours but only sleeps for a total of six hours.)

Advise the patient to restrict their total time in bed to their estimated total sleep time. It is often best for the patient to get up at the usual (household) time and to go to bed later. (For example, if the usual getting up time is 6am, suggest going to bed at midnight instead of the usual 10pm.)

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.

It is recommended patients keep this new bedtime allowance for two weeks before making any adjustments. The patient usually reports the quality of their sleep improves and they feel they are starting to have deep sleep and the sleep period is becoming consolidated.

Continuing bedtime restriction (week 3 and beyond)

If the patient is sleeping better and functioning well nothing else is needed. Many patients prefer to continue on the bedtime restriction schedule as they find it very effective.

If they are sleeping better but feel sleep deprived the next day the patient, from week 3, may wish to add 30 minutes each week to their time allowed in bed until the feelings of sleep deprivation disappear, while still maintaining continuous sleep at night.

If by week 3 the patient is 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 the patient tries each 30-minute reduction for at least two weeks before making another change. If the patient sleeps no better on five hours bedtime 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).

When and to whom to refer?

If any uncertainty exists about the diagnosis or if any safety concerns have been identified (eg, excessive daytime sleepiness or parasomnias causing injury), 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. ■

Further reading and resources

Arroll B, Fernando A, Falloon K et al. The prevalence of causes of insomnia in primary care: a cross-sectional study. *Br J Gen Pract* 2012; 62:e99-e103.

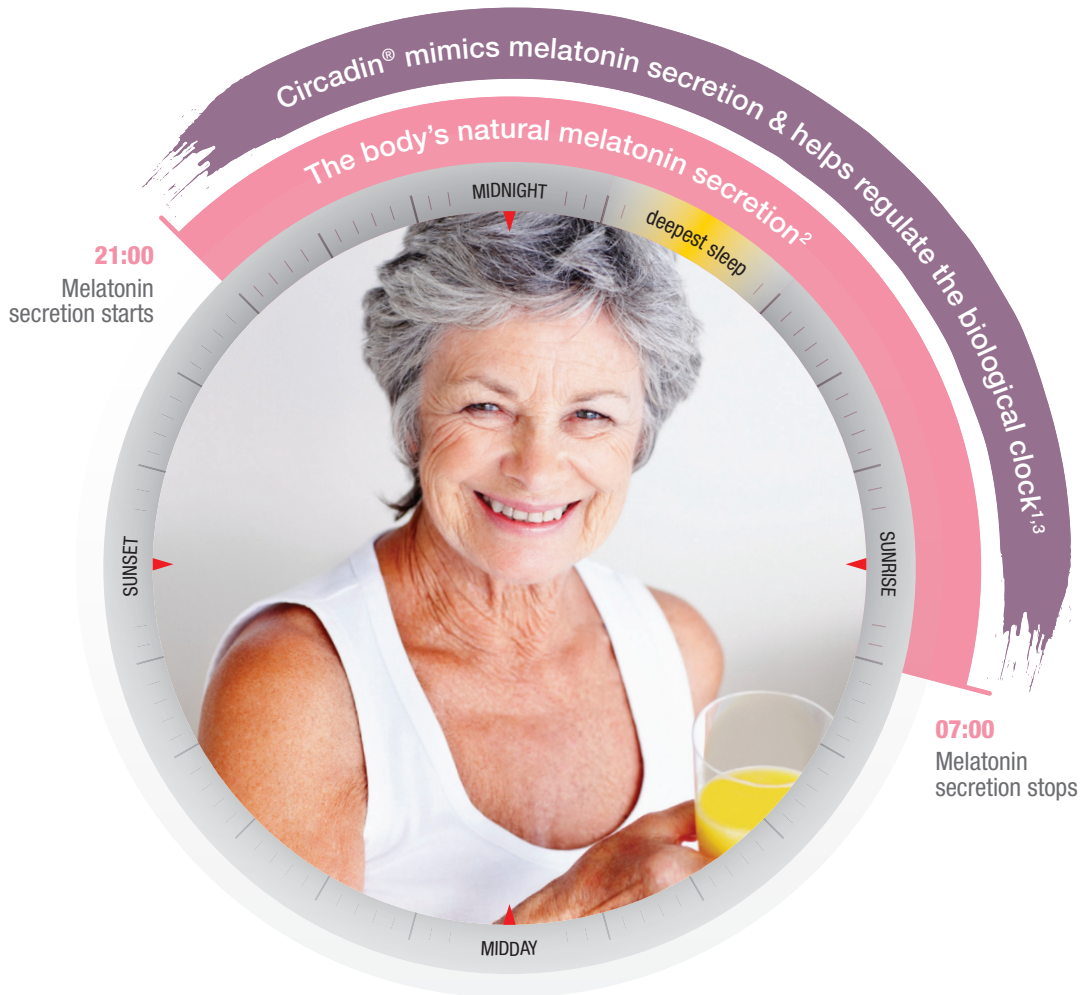
Falloon K, Arroll B, Elley CR et al. The assessment and management of insomnia in primary care *Br Med J* 2011; 342:d2899 doi: 10.1136/bmj.d2899

Diagnosis and treatment of insomnia: insomnia in primary care toolkit. University of Auckland, Goodfellow Learning (three hours' online CPD: three MOPS points. NZ\$60). Available at <http://bit.ly/139JcXx>

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1. Wade AG et al. Efficacy of prolonged release melatonin in insomnia patients aged 55-80 years: quality of sleep and next-day alertness outcomes. *Current Medical Research & Opinion* 2007;23(10):2597-2605. 2. Circadin® Datasheet. Circadin® (melatonin) Prolonged Release Tablets 2mg. 3. EPAR, Assessment report for Circadin®. Procedure No. EMEA/H/C/695. **APPROVED INDICATION:** Monotherapy for the short term treatment of primary insomnia characterized by poor quality of sleep in patients who are aged 55 or over. **CONTRAINDICATIONS:** Known hypersensitivity to any ingredient in this product. **PRECAUTIONS:** Patients with autoimmune diseases, renal insufficiency, hepatic impairment, galactose intolerance, LAPP lactase deficiency, glucose-galactose malabsorption, use in the elderly and children <18 years. May cause drowsiness and impair ability to drive and use machines. Not recommended in lactation & pregnancy (category B3). **COMMON SIDE EFFECTS:** Headache, nasopharyngitis, back pain, and arthralgia. **DOSAGE AND ADMINISTRATION:** One tablet daily 1-2 hours before bedtime and after food. Treat for up to thirteen weeks. Circadin® is an unfunded prescription medicine—a prescription charge will apply. Please review full Data Sheet before prescribing. Data Sheet is available at [www.medsafe.govt.nz](http://www.medsafe.govt.nz). Circadin® is a registered trademark of Neurim Pharmaceuticals Limited used under licence by Aspen Pharma Pty. Aspen Pharmacare. C/O Healthcare Logistics, Auckland, NZ. [www.aspenpharma.co.nz](http://www.aspenpharma.co.nz). TAPS PP3688-13AP

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