INSOMNIA MANAGEMENT

IN RESIDENTIAL AGED CARE

CASE SCENARIO

Mrs L is an 84-year-old resident at a residential aged care facility (RACF). She has been experiencing difficulty falling and staying asleep over the past month. Staff have noted that she appears drowsy during the day and has started refusing social activities. Her current medications include sertraline 50 mg OD, paracetamol 1,000 mg QID PRN and temazepam 10 mg OD, which was recently prescribed for insomnia. Staff are concerned about her increasing confusion and risk of falls.

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Introduction

Insomnia is a common issue among residents in aged care facilities,[1] often leading to significant health consequences, including cognitive impairment, increased cardiometabolic risk and reduced quality of life.[2,3] Effective management involves comprehensive sleep assessments, prioritising non-pharmacological interventions as the first-line approach, and considering pharmacological options when necessary.

Pharmacists and healthcare providers play a crucial role in supporting sleep health by identifying contributing factors, implementing evidence-based non-pharmacological strategies, and ensuring that medication use is appropriate and carefully monitored. A person-centred, individualised approach is essential to improving sleep outcomes and minimising associated risks in aged care settings.

Ageing and sleep: common sleep changes and challenges

Sleep difficulties are a common challenge among older people, with around 50% reporting issues such as light sleep, sleep disruption and early morning awakenings.[4] Despite the frequency of these complaints, sleep difficulties do not have to be an inevitable part of ageing. Rather, a number of age-related factors put older people at a higher risk of experiencing sleep disturbances. These include age-related »

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LEARNING OBJECTIVES

After reading this article, pharmacists should be able to:

- Describe factors that affect sleep and circadian rhythms in older people
- Describe the neurobiology of sleep and the neurotransmitters involved in sedation or arousal
- Discuss how insomnia is managed in residential aged care
- Discuss pharmacological and non-pharmacological strategies to help resolve sleep issues in residents living in aged care facilities.

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changes in sleep architecture, such as less time spent in slow wave (restorative) sleep and rapid eye movement (REM) sleep, more time spent in light sleep, more frequent awakenings, and increased overall wakefulness throughout the night.[5,6]

Insomnia is the most prevalent sleep disturbance, affecting up to 75% of older people,[7] with key symptoms including difficulties initiating and maintaining sleep.[8] Early morning awakenings are also common, with many older people finding it difficult to fall back to sleep after waking early.[9] Changes in circadian rhythms, such as sleep phase advances, can cause older people to feel tired earlier in the evening, and often underpin early awakenings. In older people, circadian rhythm changes can be influenced by:

- body temperature
- limited light exposure
- reduced responsiveness to external environmental cues, e.g. due to hearing or vision impairment.[10]

The most common sleep disorders in the elderly population are sleep-disordered breathing (SDB), insomnia and restless legs syndrome/periodic limb movements in sleep (RLS/PLMS).[11]

Ongoing sleep difficulties are associated with daytime sleepiness, often leading to napping throughout the day[12,13] and an increased risk of falls.[14]

Sleep-related challenges for older people can be exacerbated further by:

- chronic medical conditions such as pain, arthritis and menopause [5]
- loneliness or increased social isolation[15]
- depression and anxiety.[5]

Persistent sleep disturbances have profound impacts on older peoples' quality of life and put them at a higher risk of depression,[16] suicidal ideation,[17] hypertension and cardiovascular risk,[18] diabetes,[19,20] cognitive decline, falls and dementia.[21,22]

The neurobiology of sleep and ageing

There are regions in the brain that play a role in maintaining either 'wakefulness' or 'sleep'. The wakefulness pathways originate in the brainstem (e.g. the pons and medulla), where the initial firing of glutamatergic neurons signals wakefulness. This signalling is transmitted through neuronal tracts that project into higher brain regions, including the hypothalamus, thalamus, basal forebrain, and further into the cerebral cortex.[23–25] These tracts are linked to many different types of neurons that 'modulate' the wakefulness signal (e.g. cholinergic, dopaminergic, histaminergic, noradrenergic, and serotonergic neurons).[23–25] The recently discovered neuropeptide, orexin, among other functions, is believed to play a key role in co-ordinating and stabilising wakefulness, especially in situations requiring high alertness. Notably, there are only a select number of orexinergic neurons in the brain concentrated in the lateral hypothalamus.[26]

The ventrolateral preoptic area (VLPO) is populated by inhibitory neurons, i.e. mainly γ-aminobutyric acid (GABA) and others such as galanin, that when activated promote sleep; thus this area of the brain is considered to be the 'sleep centre'.[23,26]

Importantly there are reciprocal neuronal cross-connections between the VLPO and the arousal tracts.[23] For example, GABAergic neurons project into the key arousal tracts to inhibit wakefulness during sleep.[23] On the other hand, the firing and synaptic release of monoaminergic neurotransmitters such as histamine, serotonin and noradrenaline during wakefulness can inhibit the VLPO.[26] These cross connections generally ensure that being asleep or awake are in generally mutually exclusive states.[23]

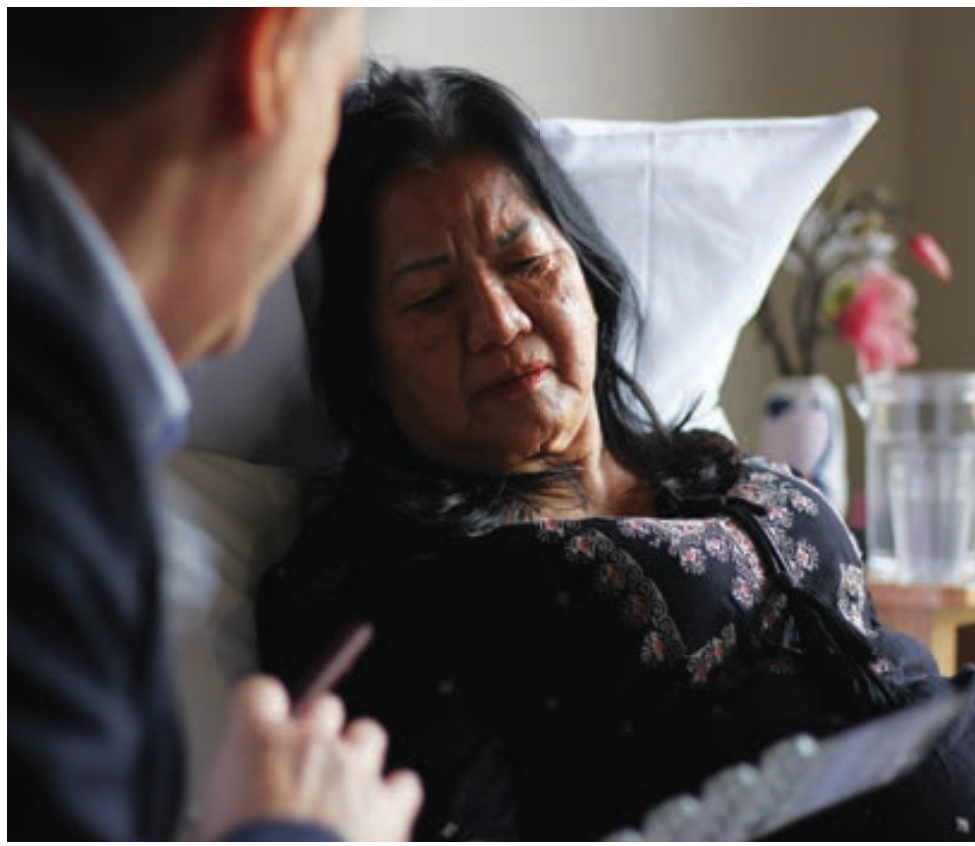
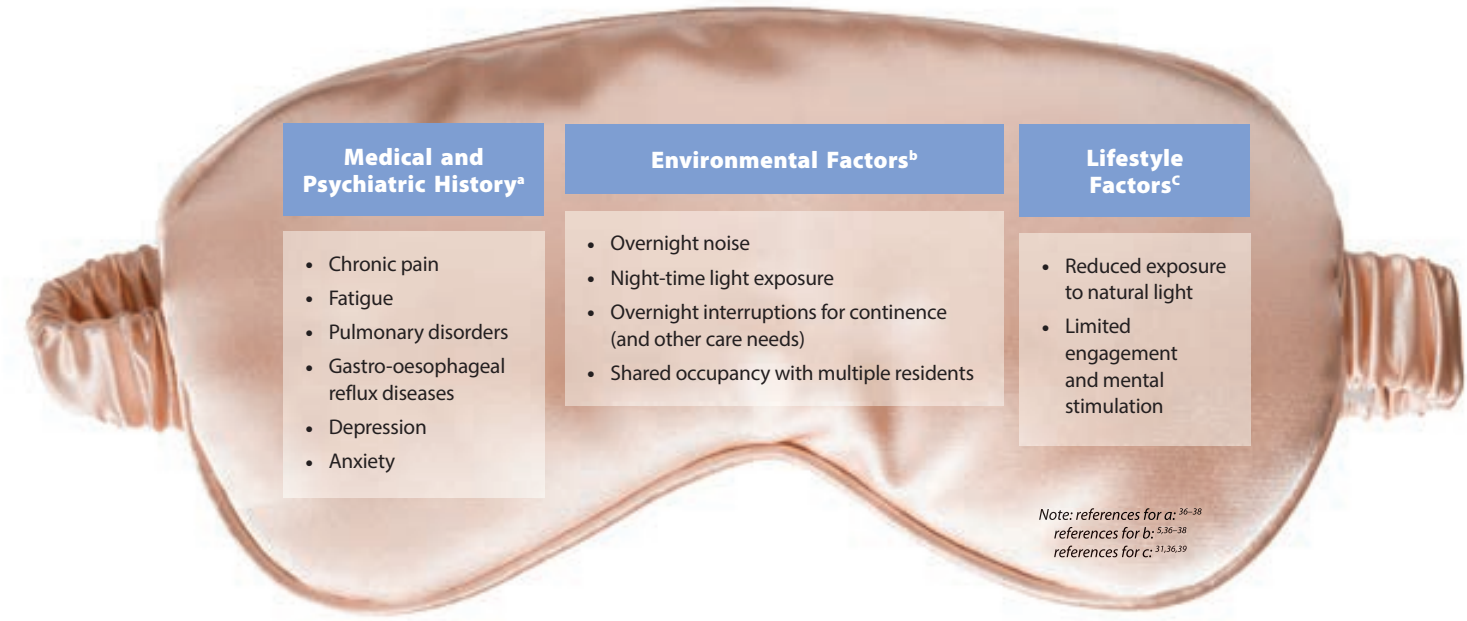


Figure 1 – Factors contributing to sleep disturbances in RACFs: pre-existing conditions, environmental and lifestyle factors.



The circadian master clock is situated in the suprachiasmatic nucleus (SCN). Melatonin is a key neurotransmitter for the circadian system, and it is synthesised in the pineal gland[27] when light-dimming is optically perceived (e.g. at evening time) and synthesis slows upon bright light perception (e.g. at morning time).[28] The lateral hypothalamic area, where orexinergic neurons are located, also receives input from the SCN (via melatonin) highlighting the control of orexinergic systems on wakefulness.[26]

The circadian system, along with physiological energy levels, and other social/environmental factors provide key signals that can influence the brain to activate the arousal tracts or the sleep centre.[23] From a therapeutic viewpoint, it is clear how pharmacological agents can impact sleep (e.g. benzodiazepines and "Z-drugs" can activate the VLPO). Additionally, many antidepressants can impact a range of receptors and alter neurotransmitter levels (i.e. acetylcholine, adrenaline, dopamine, histamine, or serotonin) and sleep/wake cycles, either promoting arousal (e.g. SSRIs and SNRIs) or causing sedation (e.g. mirtazapine, amitriptyline).[29]

Emerging evidence highlights how ageing may dysregulate these neurobiological systems that affect sleep and wakefulness.[30] For example, ageing may be associated with decreased orexin neuron counts as well as decreased neuron counts in the suprachiasmatic nuclei (dampened melatonin production).[30] Though decreased in number, orexin neurons in the ageing brain likely become hyperactive, leading to increased wakefulness and decreased sleep.[30]

The nature of sleep disturbance and insomnia for older people living in residential aged care facilities

Several studies have shown that sleep disturbances are common among older people living in residential aged care facilities (RACFs).[31–33] A study from Japan found that older people in RACFs are more likely to experience sleep disturbance and sleep disorders relative to those living in the community.[34] A cross-sectional study (n = 2,332) was conducted among seniors living in long-term care facilities and found that approximately 6.2% of older people in RACFs meet the diagnostic criteria for insomnia.[35]

A range of factors, including pre-existing medical and psychiatric conditions, as well as environmental and lifestyle factors specific to RACFs, contribute to the increased rates of sleep disturbance among residents. These factors are summarised in Figure 1 above. Additionally, RACF residents likely spend a lot of time awake in their bedroom environment and may develop a state of 'conditioned insomnia', whereby the bed/bedroom environment can become an automatic stimuli for a state of alertness and wakefulness that is incompatible with sleep. This pattern of conditioned insomnia can allow the insomnia to develop independence of any initial triggers, and become a self-maintaining condition. »

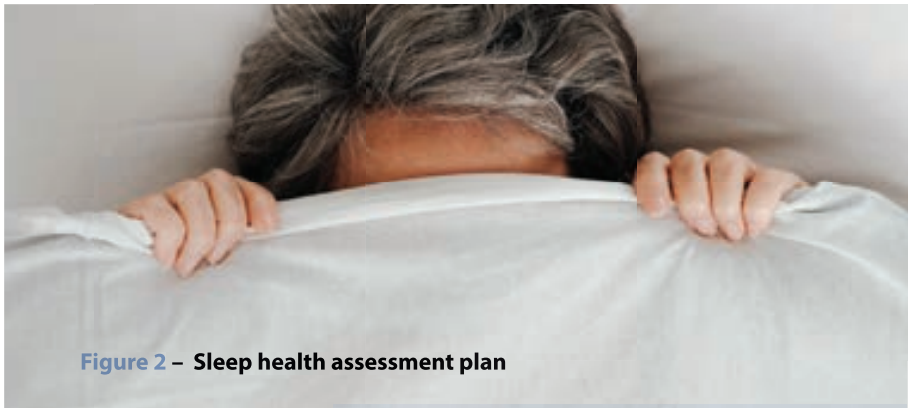


Figure 2 – Sleep health assessment plan

Sleep Assessment

- **Conducting a comprehensive sleep history:** getting the resident to walk you through a typical 24-hour sleep/wake routine (i.e. sleep onset, duration, frequency of disturbances, and daytime behaviours such as napping), or getting them to keep a sleep diary.
- **Assessing the risk of sleep disorders:** this can be done using validated questionnaires such as the OSA50 to screen for obstructive sleep apnoea risk, the Insomnia Severity Index (ISI) to check for insomnia, or the Epworth Sleepiness Scale (ESS) to check for daytime sleepiness.
- **Check previous sleep management strategies:** check ways in which the resident is currently managing their sleep issues, or how they have done so in the past.

Environmental Assessment

- **Assessing environmental factors:** check for issues such as temperature, noise, night-time interruptions (e.g. overnight care) that affect sleep.

Medical History

- **Assessing medical conditions that might affect sleep:** for example, comorbidities (medical, neurological or primary sleep disorders), psychiatric conditions and pain levels.

Medication History

- **Reviewing current medications for impact on sleep:** check medications that may exacerbate sleep disturbances, cause excessive drowsiness or alertness. Explore previous treatments for sleep disorders and whether these have been effective.

Social/Lifestyle History

- **Assessing social and lifestyle factors:** check for use of alcohol, caffeine, nicotine, level of physical activity and social engagement, napping habits, or habits/behaviours that impact sleep such as watching television when unable to sleep, etc.

Note: *Figure adapted from[39,51]; References supporting specific questionnaires – OSA50[52], ISI[53], and ESS[54]*

Sleep disturbances for people living with dementia in RACFs

In Australian RACFs, more than half of the residents are diagnosed with dementia,[40] and 38% of those living with dementia report experiencing sleep disturbances.[41] Studies have established a bidirectional relationship between sleep disturbance and dementia, particularly Alzheimer's disease (AD).[42] Specifically, sleep disturbances are linked to increased accumulation of amyloid in the brain,[43] which in turn increases the risk of AD in older people.[44] Notably, increased disruptions in sleep and reduced sleep duration have been linked to cognitive decline,[45,46] leading to memory impairments, slower thinking speed, and difficulties with attention and concentration.[10,47] Conversely, it is well-established that AD is linked to changes in normal sleep patterns and circadian rhythm disruptions[48] and is commonly associated with confused awakenings or "sundowning", which in turn has been linked to recurring nightmares and hallucinations.[49]

Identifying and assessing sleep health in residents living in RACFs

The first step in assisting residents in RACFs with their sleep health would be to undertake a comprehensive sleep health assessment. Nursing staff in RACFs report that sleep assessments (e.g. 3- or 7-day sleep diaries) usually only occur upon entry into an RACF, with no other assessments used to evaluate residents' sleep quality or disturbances.[50] Figure 2 below highlights key aspects that can be covered in a sleep/circadian health assessment. Medication reviews are a key component of pharmacists' roles; however, any recommended medicines must be carefully selected and closely monitored for effectiveness. Deprescribing plans should be in place from the outset, especially for benzodiazepines and Z-drugs.

Table 2 – Behavioural and environmental interventions

Sleep hygiene strategies	• Support residents in establishing a regular sleep-wake cycle. This includes having a set time to wake up and go to sleep each night.
	• Work with residents to develop a bedtime routine. For example, reading before bed.
	• It is important that residents' beds are comfortable, the temperature of their room is appropriate for their needs, and their room is quiet and distraction free.
	• Encourage:
	  • Spending time outside in natural light upon waking in the morning (further information provided in light therapy below).
	  • Avoiding bright lights at night-time. Dimming the lights or the use of lamps should be encouraged. The use of smart phones and other electronics in bed should be discouraged.
	  • Where possible use common areas, rather than the bedroom, for awake activities such as watching TV and reading.
	  • Avoiding caffeine (tea and coffee) and nicotine from 1 pm. Encourage decaffeinated beverages as an alternative.
	  • Daytime naps to be limited to 15–30 minutes, and avoid naps in the late afternoon/evening.
	  • Limiting larger meals and fluid intake before bed. Encourage light snacks as an alternative.
	  • Getting out of bed and engaging in a relaxing activity when experiencing difficulties with getting to sleep.

Cognitive Behavioural Therapy for Insomnia (CBT-I)	• CBT-I is a structured, multi-component approach that targets the behavioural and cognitive factors that contribute to insomnia. It typically includes sleep education, sleep hygiene strategies, and behavioural and cognitive techniques to address unhelpful thoughts and behaviours related to sleep. It is helpful for residents experiencing symptoms of insomnia.
Light therapy	• Bright light therapy involves the use of a light box or light glasses to assist with adjusting circadian rhythm (sleep-wake) cycles. The timing of light therapy (e.g. morning vs evening light administration) needs to be tailored to each individual resident's body clock and sleep-wake patterns. This therapy is particularly helpful during the winter months. • Studies investigating the use of light boxes in RACFs have reported mixed results. Only one study demonstrated improvements in sleep consolidation. • Other alternatives include exposure to natural outdoor sunlight. This includes either spending time outdoors (e.g. walking or sitting) or sitting next to a window with open blinds.
Physical activity interventions	• Physical activity interventions include structured daytime activities such as aerobic exercise, and resistance training. Other suggestions include walking, gardening or other enjoyable physical activities. • Mixed results: some studies have found improvements in sleep outcomes, including increased sleep duration, sleep quality and sleep efficiency.
Mindfulness/ relaxation interventions	• Mindfulness interventions include meditation training, relaxation strategies, yoga and moment-to-moment awareness. • Studies have demonstrated positive effects on sleep.

Note: *Table compiled from a range of references: sleep hygiene[55,56]; CBT-I[57–59]; light therapy[60]; physical activity interventions[61]; mindfulness/relaxation interventions.[60,61]*

Non-pharmacological interventions to support sleep health

Non-pharmacological interventions should be offered to all individuals experiencing sleep difficulties regardless of the type of sleep disorder. These include a variety of lifestyle changes, behavioural and environmental strategies, and evidence-based therapies to support sleep (see Table 1). These interventions should be considered as initial treatment approaches to sleep disturbances in RACFs. They should be individualised and based on the outcomes of a comprehensive sleep assessment. A review of non-pharmacological approaches suggests that combining interventions is more likely to improve sleep in RACFs than using a single intervention alone,[52] emphasising the importance of individualising interventions to meet the needs of each resident.

Pharmacological management of sleep issues in older people

In older people experiencing insomnia, benzodiazepines should generally be avoided due to their well-documented risks, including increased falls, fractures, over-sedation and dependence.[62,63] However, melatonin has an approved indication for use in older people.[64] Despite small effect sizes on insomnia,[65] melatonin may be worth trialling in this age group, »

given it has a better safety profile compared to benzodiazepines.[64] Sedating antidepressants, antipsychotics and over-the-counter antihistamines have limited evidence for use in insomnia in older people and are associated with significant adverse effects; therefore, they should not be used for this purpose.[64] Some trials are being done to test the use of dual orexin receptor antagonists for insomnia in older people,[66] given their safety profile is good, however more data may be needed to support this. People at risk of obstructive sleep apnoea should be treated according to best practice guidelines, typically with non-pharmacological interventions.[67] Similarly, conditions such as restless legs syndrome should be managed following appropriate diagnosis, if symptoms are significantly impacting sleep, and after considering the side effects of medication.

Knowledge to practice

Pharmacists and healthcare professionals play a vital role in identifying and managing sleep disturbances in aged care residents. Conducting thorough sleep assessments can help determine underlying causes, including medical conditions, medication effects and environmental factors.

By integrating sleep health discussions into routine care, healthcare providers can support residents in adopting evidence-based strategies to improve sleep quality. Pharmacists in particular, can provide counselling on non-pharmacological treatments, helping residents implement sleep hygiene practices, behavioural strategies and environmental modifications. They can also assist in identifying inappropriate medication use, advising on safer alternatives when pharmacological treatment is required, and collaborating with other healthcare professionals to ensure individualised, person-centred care.

Conclusion

Effective management of insomnia in RACFs requires a person-centred approach that prioritises non-pharmacological strategies, such as sleep hygiene and behavioural interventions, before considering pharmacological options. When medication is necessary, careful selection is crucial to minimise risks and optimise benefits for older adults. As poor sleep poses a range of health risks, including those to cardiometabolic, mental and cognitive health, focusing on or maintaining good sleep is especially important in this population.

CASE SCENARIO CONTINUED

The pharmacist conducts a medication review and identifies that temazepam may be contributing to Mrs L's daytime drowsiness, confusion and increased falls risk. The pharmacist discusses non-pharmacological strategies with the RACF team, including sleep hygiene education, limiting caffeine intake after 1 pm, and maintaining a consistent bedtime routine. A deprescribing plan for temazepam is developed in collaboration with the GP, aiming for gradual dose reduction. The pharmacist also recommends monitoring sleep quality and behavioural changes during and after withdrawal. Educational materials are provided to RACF staff to support behavioural and environmental interventions that promote sleep. A follow-up is scheduled to assess Mrs L's progress and ensure safety throughout the deprescribing process. »

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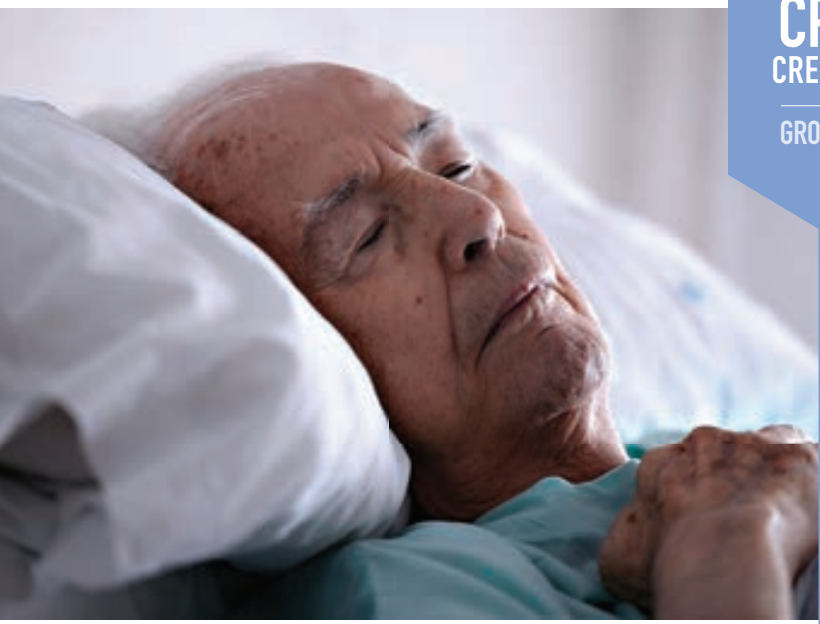

KEY POINTS

- **Sleep disorders such as insomnia, obstructive sleep apnoea and restless legs syndrome/periodic limb movements in sleep (RLS/PLMS) are common in older people residing in aged care facilities.**
- **Chronic sleep difficulties can lead to serious health consequences.**
- **Sleep health should be regularly and comprehensively assessed in residents living in aged care facilities.**
- **A range of non-pharmacological strategies can be used to improve sleep and circadian health in this population.**
- **If using pharmacological management for insomnia in older people, medications such as benzodiazepines should be carefully used and monitored with deprescribing plans in place when prescribed even for the first time. Other agents such as melatonin, and orexin receptor antagonists are also available and may be viable alternatives to use in older people.** AP

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ASSESSMENT QUESTIONS

Each question has only one correct answer.

1 In older people, circadian rhythm changes can be influenced by all of the following factors *EXCEPT*:

A Body temperature.
B Limited exposure to light.
C Reduced responsiveness to external environmental cues.
D Heightened responsiveness to external environmental cues.

2 Which of the following types of neurotransmitters would be *MORE LIKELY* to be active during periods of sleep?

A Galanin.
B Histamine.
C Serotonin.
D Noradrenaline.

3 Which of the following would be *APPROPRIATE* sleep hygiene advice to provide for improving residents' sleep in aged care facilities?

A Encourage residents to avoid spending time outside in natural light upon awaking.
B Ensure bright lights are used throughout night-time, as dimming may lead to falls.
C Ensure daytime naps are limited to 15–30 minutes and avoided in the late afternoon.
D Ensure residents do not get out of bed, even if they are having trouble sleeping.

4 Which of the following is *TRUE* about the use of melatonin to manage sleep in older people?

A Melatonin should not be used in older people who are experiencing insomnia.
B Melatonin is indicated for use in insomnia in people older than 55 years of age.
C Melatonin has a less favourable safety profile compared to benzodiazepines.
D Melatonin is not useful in older people with insomnia as they may have a dampened melatonin production.