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leep problems are very common in older people, especially those in residential care. Up to two-thirds of people in residential care facilities have some type of sleep disturbance related to a primary sleep disorder, a mental condition or medical condition. As people age, a number of changes occur to sleep patterns.

Many medications can interfere with sleep. Drugs may suppress rapid eye movement (REM) sleep, affect slow-wave sleep (SWS), or cause insomnia, parasomnias, nightmares, excessive sleep, difficulty falling asleep, early-morning awakening, and periodic awakenings.

Insomnia
Insomnia causes at least one of the following complaints:
- Difficulty initiating and/or maintaining sleep
- Sleep that is poor in quality
- Trouble sleeping despite adequate opportunity and circumstances for sleep
- Waking up too early

Age-related changes
The stages of sleep include stage 1 to 4 or non-REM sleep and REM sleep. People have 4 or 5 cycles of sleep during the night, beginning with non-REM stages and ending with REM sleep. Typically adults spend almost 50% of total sleep time in stage 2 sleep, about 20% in REM sleep, and the remaining 30% in the other stages.

Stage 1 sleep is light, and can be awakened easily. In stage 2 sleep, eye movements stop and brain waves become slower. In stage 3, extremely slow brain waves called delta waves begin to appear, interspersed with smaller, faster waves. By stage 4, the brain produces delta waves almost exclusively. It is very difficult to wake someone during stages 3 and 4, which together are called deep sleep or slow-wave sleep. There is no eye movement or muscle activity. People awakened during deep sleep do not adjust immediately and often feel groggy and disoriented for several minutes after they wake up.

The following changes to sleep occur as a normal consequence of ageing:
- More time spent in bed
- More time trying to fall asleep (sleep latency)
- Less time sleeping
- Sleep tends to be lighter - Stages 3 and 4 and REM sleep decreases
- More frequent awakenings
- Less time for restorative functions

It is usual for older people to have a shorter overall sleep period, and to spend more time in the lighter stages of sleep (stage 1 and 2) and less time in the restorative stages (stages 3 and 4) and REM sleep decreases.

Symptoms
Residents who complain about insomnia generally admit to excessive daytime sleepiness and unrefreshing sleep. This is due to the fact that restorative sleep in stages 3 and 4 is reduced. As a result, residents will tend to nap more in the day, which contributes to the vicious cycle of increased sleep latency at bedtime.

If left untreated, this sleep deficit can lead to cognitive impairment, resulting in a greater risk of accidents and falls, and an inability to carry out daily tasks.

Types of sleep disorders
Sleep problems may be classified as primary or secondary.

Primary sleep disorders include:
- Insomnia
- Excessive sleepiness (hypersomnia)
- Abnormal behaviours during sleep (parasomnias)

Secondary sleep disorders occur due to:
- Psychiatric disorders
- Medical conditions
- Medications

Medical conditions that impact on sleep include depression, anxiety, psychosis, reflux disease (GORD), Parkinson’s disease, dementia, arthritis, pain, respiratory conditions such as COPD and asthma, heart failure, menopause, sleep apnoea, thyroid disease and nocturia.

People with Alzheimer’s disease and other dementias often experience a reversal of normal sleep patterns, sleep fragmentation, poor sleep quality and shallow sleep.

Medication causes
Some medications may cause sleep disorders by causing or exacerbating nocturia, nightmares or excessive stimulation.

These medications include:
- Alcohol/alcohol withdrawal
- Appetite suppressants
- Amantadine (Symmetrel)
- Amiodarone (Cordarone X, Aratac)
Drug-induced sleep problems, continued

- Benzodiazepine withdrawal
- Bupropion (Zyban SR)
- Caffeine (Panadol Extra, Cafergot)
- Clonidine (Catapres)
- Corticosteroids (e.g. prednisone, prednisolone)
- Decongestants (e.g. pseudoephedrine)
- Diuretics
- Donepezil (Aricept)
- Levodopa (Sinemet, Madopar, Stalevo)
- Lithium (Lithicarb)
- MAOI antidepressants (e.g. Parnate, Nardil)
- Methyldopa (Aldomet)
- Nicotine
- Propranolol (Inderal) and other beta-blockers
- Selegiline (Eldepryl)
- SSRI antidepressants
- Theophylline (Nuelin)
- Thyroxine (Oroxine)
- Venlafaxine (Effexor-XR)

When people start on SSRI antidepressants or venlafaxine (Effexor-XR), insomnia may be experienced initially. These medications are therefore best administered in the morning.

Beta-blockers, in particular propranolol (Inderal), increase wakefulness by causing insomnia and nightmares, and by suppressing REM sleep. Newer beta-blockers like atenolol do not usually cause this effect.

Although alcohol initially causes drowsiness, it disrupts sleep later in the evening, decreases REM sleep, and increases awakenings.

Cigarette smoking and coffee consumption can impair sleep as well.

REM sleep
REM sleep is the portion of sleep when there are rapid eye movements (REM). Dreams occur during REM sleep. We typically have 3 to 5 periods of REM sleep per night. In adults, REM sleep typically occurs about 90 minutes after falling asleep. REM periods occur at intervals of 1 to 2 hours.

Drugs that suppress REM sleep increase the likelihood of some parasomnias. Parasomnias include sleep walking, night terrors, bruxism (teeth grinding), restless legs syndrome and periodic leg movements. Nightmares are associated with REM sleep and occur primarily in the second half of the sleep period.

Monoamine oxidase inhibitors (MAOIs) antidepressants (e.g. Parnate, Nardil), tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs), are all classes of antidepressants. They all profoundly suppress REM sleep. TCAs and SSRIs have been shown to produce immediate and sustained reductions in REM sleep. This effect often causes increased fatigue in residents who take antidepressants for extended periods of time.

Suppression of REM sleep is also seen with opioid analgesics. Opiates also fragment sleep and decrease stage 2 sleep.

Alcohol intake immediately before sleep suppresses REM sleep during the first half of the night, but then results in excessive REM sleep later in the night.

Mirtazapine (Avanza, Remeron) either has no effect on REM sleep or increases it slightly.

Slow-wave sleep
Slow-wave sleep is stage 3 and stage 4 non-REM sleep.

Slow-wave sleep suppression is seen with corticosteroids such as prednisone and prednisolone. This leaves the person feeling unrested after sleeping, and may lead to insomnia.

Management
Management of medication-induced sleep problems is initially aimed at identification of medications that may be causing the problem, and then assessment for ceasing them or changing to an alternate medication.

Non-drug treatments should be introduced before adding any additional medications:
- Sleep hygiene
- Cognitive behavioural therapy
- Exercise, within limits
- Relaxation therapy
- Sleep restriction
- Stimulus control therapy
- Temporal control measures

Clomipramine (Anafranil), a tricyclic antidepressant, may be used to suppress REM related nightmares.

Hypnotics such as temazepam should only be prescribed at the lowest dose for the shortest period of time. Hypnotics should be discontinued gradually, and be alert for rebound insomnia and withdrawal symptoms.

Residential Medication Management Reviews (RMMRs) can identify sleep problems potentially caused by medications and provide suggestions for alternatives. All residents are eligible for a RMMR.

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