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A GOOD NIGHT'S SLEEP

Sleep Information Handout

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Sleep is an important part of reaching health goals. It is essential for survival, providing rest and recuperation for the mind and body. Shakespeare called sleep 'the chief nourisher in life's feast'. Adequate sleep is a primary component of a healthy lifestyle and the quest for longevity. It is as important to wellbeing as a healthy diet and regular exercise, and just as difficult to achieve and maintain. Although often the undesirable result of our busy lives, insufficient sleep may also be indicative of imperfect health and can itself lead to future health problems.

Understanding sleep

Sleep need varies

Different people need different amounts of sleep. Some people can cope very well with much less and some need much more every night. Younger people have different sleep needs. The drive for sleep, or homeostatic sleep pressure, builds up the longer we are awake and dissipates during sleep. The folk belief that we should sleep eight hours seems to be incorrect. Numerous studies have shown that self-reported sleep longer than 7.5 hours or shorter than 6.5 hours predicts increased mortality risk.

Sleep is an active state

We used to think that everything shuts down when we sleep but over the last 60 years scientists have discovered that our brains are very active while we sleep. In fact, some parts of the brain use more oxygen and glucose while asleep than when awake. Research tells us that sleep is divided into two stages – REM (rapid-eye-movement) sleep and non-REM sleep.

REM sleep: this type of sleep occurs for about 25% of the night and is characterised by electrical activation of the brain, very relaxed muscles and the body becoming immobile, and rapid eye movements

as the eyes dart back and forth under closed eyelids. REM sleep provides energy to the brain and body and supports daytime performance. Dreams often occur during REM sleep although they can occur at any stage.

Non-REM sleep: this type of sleep occurs during the other 75% of the time and can be further broken down into four stages (lightest to deepest sleep respectively):

Stage 1: this stage is light sleep between being awake and falling asleep.

Stage 2: this stage is the onset of sleep, when the person begins to become disengaged from their surroundings. Body temperature drops and breathing and heart rate become regular.

Stages 3 & 4: These stages are the deepest and most restorative sleep, known as 'delta sleep'. Stage 3 is a transition into Stage 4, or 'true delta.' During these stages, blood pressure drops, breathing becomes slower, muscles are relaxed and receiving more blood supply, tissue growth and repair occurs, and hormones are released (including growth hormone, which is why growing teenagers need to sleep more).

Sleep changes in cycles

A normal night of sleep in an adult begins with about 80 to 90 minutes of non-REM sleep, followed by a 10- to 15-minute period of REM sleep. The two stages alternate throughout the night with a REM-non-REM cycle length of approximately 100 minutes. The duration of REM sleep periods tends to increase with each successive cycle. The cycle repeats 4 to 5 times across a normal sleep period. Both REM and non-REM sleep are necessary for the maintenance of good health. We have very brief arousals many times across the night. We are not aware of most of these arousals and we forget most dreams.

Our body clock affects our tiredness

The propensity for sleep is regulated by the endogenous circadian "body clock". When the body clock is timed normally, sleepiness is high during the night time and low during the day, and night time sleep is well consolidated. The two processes of homeostatic sleep pressure and circadian function work together to promote regular sleep patterns. Disturbance of the body clock (such as in jet lag and shift work) results in insomnia symptoms when the individual attempts to sleep and excessive sleepiness during wake time.

Sleep Disorders

Insomnia

A prevalent and persistent disorder that relates to a problem initiating or maintaining sleep, despite the opportunity for adequate sleep, and tends to result in day time fatigue. Current research defines it as 24 hour disorder of hyperarousal. Since there is no 'normal' amount of sleep that everyone should get, a diagnosis of insomnia does not depend on the number of hours an individual may sleep. Insomnia is a symptom, not a disease, so its cause needs to be identified and corrected.

Insomnia can be classified in terms of either its duration (acute or chronic) or its aetiology (primary or secondary). Acute insomnia (also known as transient insomnia) generally results from a significant event in ones daily life (eg. trauma, long distance travel, change in sleep/awake pattern) and can be treated directly or preventative measures might be adopted. Chronic insomnia tends to be longer lasting with an association with medical aetiology and requires a more rigorous assessment to determine treatment options. Primary insomnia are those where there is no mental or physical cause requiring more direct treatment while secondary insomnia results as co-morbidity associated with other mental or physical illness requiring a more considered treatment approach. One confounding aspect of insomnia is the myriad of causes and contributory factors.

Often the cause is discomfort from an illness. Other times it can be feeling upset or stressed. In these cases what needs to be done is to get rid of the cause. But in other cases there is no obvious cause. Here it can help to adopt good sleep habits (see below). If this is not enough there are more complex treatments such as cognitive behaviour therapy which needs a skilled therapist. Several sedative prescription medications are available for insomnia but these should be used only under the guidance of physicians and only for a short period.

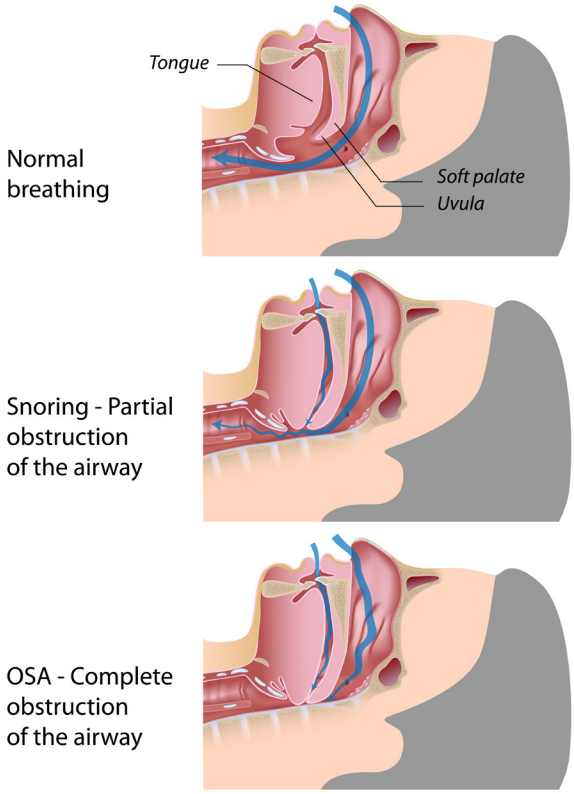
Risk factors for insomnia include being older than 60 years, having a history of mental health disorders

including depression, generalized anxiety disorder and post traumatic stress disorder, emotional stress, pregnancy, working at night or in shifts and travelling through different time zones.

The most obvious symptom of insomnia is a long and restless night but it's the daytime symptoms that can really take their toll. Inadequate or poor quality sleep (non-restorative sleep) can result in tiredness, irritability and forgetfulness and may even increase the risk of injury. Chronic insomnia (symptoms for more than a month) can have important consequences for sufferers and may impact on health, work, family life and quality of life.

Snoring

A common problem. It affects up to 40% of men and 20% of women on a regular basis. It gets worse with age and weight gain. Someone who snores can disturb their partner's sleep. This can cause distress for both of them. As well, many regular snorers also have obstructive sleep apnoea.



Obstructive Sleep Apnoea

This means losing your ability to breathe freely. It happens over and over while asleep. It is caused by a narrow, floppy throat. Most people who have sleep apnoea snore too. The period when the sleeper has trouble breathing ends with them waking up. This arousal is often very brief with no memory of it. But arousing over and over like this disrupts sleep and causes excessive tiredness during the day. There are treatments that work. These include weight loss, cutting down on alcohol, dental devices and continuous positive airway pressure (CPAP) therapy.

Sleep Hypoventilation

The muscles that we use to breathe need to be told to do so by the brain. When we sleep, there is less drive to do this from the brain. This means that people who have breathing muscles that are weak or under excessive load from severe lung disorders or obesity may not breathe strongly enough during sleep. This is known as sleep hypoventilation. With no treatment, this can lead to breathing and heart failure during the day. Devices to help breathing during sleep will work in treating this. This treatment is called non-invasive positive pressure ventilation.

Parasomnias

Includes nightmares, sleep walking and night terrors.

Bruxism

Grinding of teeth.

Circadian Rhythm Disorders

Where the desire and ability to sleep are out of phase with the 24-hour social environment, such as jet lag and shift work sleep disorder.

Narcolepsy

A person with narcolepsy is extremely sleepy all the time and, in severe cases, falls asleep involuntarily several times every day. It is thought that narcolepsy is caused by a malfunctioning of the hypothalamus in the brain. This is a rare condition with no cure.

Restless Legs Syndrome

A overwhelming urge to move your legs, particularly when trying to sleep. Also periodic limb movement disorder, where involuntary movements of the legs and sometimes arms, disturb sleep.

The different ways it can present, include:

- **Sleep initiation (or onset):**
  Going to sleep takes more than 30 minutes
- **Sleep maintenance:**
  Being awake during the night (more than 30 to 45 minutes)
- **Early termination (sleep offset):**
  Waking earlier than intended without being able to resume sleep
- **Nonrestorative:**
  Persistent sleepiness regardless of sleep of adequate duration
- **A combination of the above difficulties**

Good Sleep Habits

1. **Set a schedule.**

   Go to bed and wake up at the same time each day. Sleeping in on weekends makes it harder to wake up early on Monday morning because it re-sets your sleep cycles for a later awakening.

2. **Use your bed only for sleep and intimacy.**

   Television, computers and other distractions can interfere with your sleep. Experts say one of the most alluring sleep distractions is the 24-hour accessibility of the internet.

3. **Get regular exercise each day.**

   For maximum benefit, try to get your exercise about two to three hours before going to bed. Exercise immediately before bed stimulates the body and may make it difficult to fall asleep.

4. **Try to spend some daytime outdoors in natural light.**

   Light is important for the body to produce melatonin which is a sleep promoting substance. Sunlight early in the day is particularly helpful in synchronising your body clock. Sleep experts recommend exposure to an hour of morning sunlight for people having problems falling asleep.

5. **Make the bedroom as restful as possible.**

   You should have a quiet, dark room with comfortable bedding and good temperature control.

6. **Take medications as directed.**

   Prescription medications may cause you to be alert or sleepy and the instructions that come with them should be followed. Don't vary the time of day that you take your medication.

7. **Be comfortable and relaxed before bed.**

   A warm bath, gentle reading, or another relaxing routine can make it easier to fall asleep. You can train yourself to associate certain restful activities with sleep and make them part of your bedtime ritual. Don't go to bed too hungry or too full. Try a cup of chamomile tea before bed to harness its relaxing properties. Try a few drops of lavender essential oil on your pillow, or in the bath, at night to relax you. A glass of warm milk is an old fashioned recipe that may work well. If frequent trips to the toilet are a problem during the night, try not to drink too much before bedtime and make sure you go to bed with an empty bladder.

8. **Avoid alcohol, caffeine and cigarettes.**

   Alcohol robs people of deep sleep, and REM sleep, and keeps them in the lighter stages of sleep. Caffeine (tea, coffee, chocolate, soft drinks, diet drugs, some pain relievers) and the nicotine in cigarettes are stimulants that can keep you awake. Refrain from substantial caffeine use (approximately 400mg – one cup (250mL) of brewed coffee contains roughly 80 to 350mg of caffeine) for a minimum of six hours prior to bedtime. Smokers tend to sleep very lightly and often wake up in the early morning due to nicotine withdrawal.

9. **Avoid daytime naps.**

   If a nap is necessary, for example because of a late night, then limit this to about thirty minutes. Make sure that you are awake for at least four hours before going back to bed.

10. **Avoid sleeping pills except in exceptional circumstances.**

    They do not fix the cause of your sleeping problem. In Australia the most commonly prescribed medications for insomnia are the benzodiazepines (BZP), temazepam and diazepam. Although these medications are efficacious they are associated with tolerance,

dependence, residual daytime sedative effects, cognitive and psychomotor impairment and discontinuation syndromes, including rebound insomnia and withdrawal symptoms. For this reason BZP use should be judicious and short-term.

11. **Don't lie in bed awake.**

    If you do not fall asleep in a reasonable time, about 20 to 30 minutes, then get up and do something else in another room, like reading, until you feel tired. The anxiety of being unable to fall asleep can actually contribute to insomnia. Try and keep the lighting dim. When you are tired go back to bed. Scientists have determined that counting sheep is ineffective for putting oneself to sleep. Evidently it is too boring and imagining a calming landscape generally works much better.

Interesting sleep facts

- The 1989 Exxon Valdez oil spill off Alaska, the Challenger space shuttle disaster and the Chernobyl nuclear accident have all been attributed to human errors in which sleep-deprivation played a role.
- Yawning may have the dubious distinction of being the least understood, common human behaviour. Even though yawning is an everyday phenomenon no particular physiological significance has been associated with it. Modern science is still on the lookout for a complete explanation of the mechanisms and the purpose which yawning accomplishes, and the debate about its usefulness is still ongoing.
- That physiological phenomena right before you fall asleep when all of a sudden you jolt wide awake has a name – it's called a hypnic jerk.
- It's impossible to sneeze while sleeping due to REM atonia - a bodily state wherein motor neurons are not stimulated and reflex signals are not relayed to the brain.
- The scientifically documented record for the longest period a human has intentionally gone without sleep, not using stimulants of any kind, is 264.4 hours (11 days 24 minutes), set in 1964. Records for voluntary sleep deprivation are no longer kept by Guinness World Records for fear that participants will suffer ill effects.
- Sleep loss can lead to impairments in glucose metabolism and increases in insulin levels, which could increase the risk of the development of diabetes. Partial sleep deprivation is also associated with changes in the appetite regulating hormones, leptin and ghrelin, and these changes would indicate an increase in appetite, which may lead to increased food intake and weight gain.
- Fatigue contributes to 20 to 30% of all deaths on the road in Australia. This means it is as major a contributory factor to the road toll as speeding and drink driving.
- A driver who has been awake for 17 to 19 hours has a driving ability similar to that of a driver with a blood alcohol concentration (BAC) of 0.05.

Resources

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