Sleep Health
FOUNDATION

HEALTHY SLEEP AND SLEEP DISORDERS

THE NATURE OF SLEEP

A Basic Need

Sleep is one of our most basic needs. We all know that good sleep is needed after the activities of the day to feel refreshed, restored and able to face the next day's challenges satisfactorily. Other important functions occur during sleep including processing of information ("sleeping on the problem") and consolidating memory. However exactly how the brain accomplishes this during sleep remains unclear.

An Active Process

The brain is certainly active during sleep, as is demonstrated by the electrical signals (the electroencephalograph, or EEG) that are generated while asleep. These signals are very different to those of wakefulness, reflecting the different nature of this activity as rest and information processing take place. During healthy sleep blood pressure, heart rate, breathing and body temperature all decrease compared to wakefulness.

Inadequate Sleep

Inadequate sleep can result from insufficient duration (often because insufficient time in bed has been allowed for), inappropriate timing (as can occur with shift work or jet lag) or inadequate quality (as occurs with sleep disorders). The consequences of inadequate sleep include: tiredness and lethargy; impaired memory and concentration; disturbed ability to perform tasks requiring attention, vigilance and complex thinking; and mood changes including increased irritability

HOW MUCH SLEEP DO WE NEED?

Length of Sleep

The requirement for sleep decreases from birth until early adult life with some variability in sleep requirement between individuals. Babies need up to 16 hours of sleep a day. By the age of five average sleep requirement has decreased to 11 hours a day and by the age of ten to 10 hours a day. Adolescents require around 9 hours of sleep. Average adult sleep requirement is approximately 8 hours sleep in 24 hours. However there can be a wide variation in individual need around these averages with some requiring less than the average and others more. Most adults need between 6.5 hours to 8.5 hours. With ageing there is a decrease in the proportion of sleep spent in deep (slow wave) sleep and in dreaming (rapid eye

movement) sleep. As we get older sleep becomes less efficient and so the elderly tend to spend more time in bed to achieve similar lengths of sleep than they did as young adults. A sustained increase in sleep requirement in an individual can indicate he or she has an evolving sleep disorder.

Individual Requirements Differ

Most adults know their own sleep requirements from their life's experience which informs them of the number of hours they need, on average, to feel refreshed the next day. Less sleep than this can be sustained for short periods only as a sleep debt accumulates that eventually needs to be repaid by longer sleep than normal. Mistakes occur when individuals assume that all people need the same amount of sleep, transposing their own requirements onto to those of others. As a result some people with relatively short sleep needs may regard others with longer needs as "lazy". Similarly, parents can misjudge the comparatively lengthy requirements of their young children, resulting in potentially harmful sleep deprivation.

In adult life an individual's average sleep requirement is relatively stable. A sustained increase in sleep need suggests a problem with sleep quality, such as a developing sleep disorder.

SLEEP PROBLEMS IN OUR COMMUNITY

There are high levels of self reported sleep problems in the Australian community. While there are over 70 clinically diagnosable sleep disorders that can result in disturbed sleep and/or excessive daytime sleepiness, the most common sleep problems are in the following categories:

- voluntary sleep restriction or sleep deprivation with a low priority given to sleep relative to the other activities in our modern, often hectic 24/7 lifestyle;
- insomnia;
- obstructive sleep apnoea and other sleep related breathing disorders;
- restless legs syndrome.

These problems are discussed below.

VOLUNTARY SLEEP RESTRICTION AND SLEEP DEPRIVATION: Shiftwork and Other Priorities that Compete with Sleep

Voluntary Sleep Restriction occurs where an individual does not allow enough time in bed to obtain sufficient sleep for his or her needs. Work, family commitments, exercise and social activities are the usual reasons for foregoing sleep. The ease with which people can be contacted 24 hours a day and the availability and range of tempting after-hours activities means it is often very difficult to set boundaries around work and social lives. Examples of activities contributing to voluntary sleep restriction include: late night entertainment; text messaging and phone use; and internet use including email, facebook, and interactive games (often with people living in a different time zone). Teenagers and young adults are particularly prone to these temptations.

Sleep Deprivation also occurs because of less controllable external factors rather than individual lifestyle choice. These factors include: shift work (particularly night shifts and rotating shifts); disrupted sleep from caring for babies and sick children; and jet lag. Amongst its disrupting effects shift work predisposes to insomnia and other health related issues. The delayed sleep phase type (normal sleep but with sleep onset delayed by several hours or more) that teenagers often develop as a result of their late night habits, and to some extent their physiology, will inevitably result in sleep deprivation as they still need to get up in the morning in time for work, school or university despite retiring to bed late.

Consequences of Sleep Deprivation: are well documented and include: excessive sleepiness; difficulty with memory, concentration and performance of complex tasks; and mood disturbances including irritability. Young children may develop behavioural problems. Learning is adversely affected. Accident risk increases (both on the road and in the workplace or home) reflecting inattention and impaired vigilance. Poor sleep habits in teenage years risk establishing persistent sleep problems with lifelong consequences.

Treatment for Voluntary Sleep Restriction and Sleep Deprivation **starts with:**

- Recognising the importance of adequate sleep for good health;
- Making a decision to set a time period for an adequate sleep opportunity of at least 6.5-8.5 hours, depending on individual requirement;
- Turning off all electronic equipment at a set time every night or at least during the working week;
- Evaluating associated stress factors and making changes to reduce their effect;
- Negotiating with employer(s) and/or occupational health and safety experts regarding adequate time off for recuperation when working rotating shifts and night shifts. Having somewhere to have a short nap during a night shift may also improve productivity and work safety.

INSOMNIA

Insomnia is characterised by difficulty in falling asleep, re-achieving asleep if awoken or waking too early. Characteristically, the individual feels sleep is inadequate for her/his needs.

Insomnia is a Common Problem

Most people having experienced insomnia at some point in their lives. In a recent US survey, their National Sleep Foundation found 18% of individuals reported difficulty falling asleep, 33% had frequent wakening and 23% woke too early.

Risk Factors for Insomnia

Women report insomnia symptoms nearly twice as often as men. Insomnia is also more common with increasing age which is also associated with increased occurrence of other medical and psychiatric conditions that interfere with sleep.

Shift workers are at increased risk of insomnia as the normal day-night circadian rhythm acts to maintain wakefulness during the day, when trying to sleep, and increase the tendency for sleepiness overnight when on duty.

Insomnia has Many Potential Causes

- The most common causes relate to precipitating events or "triggers" such as personal loss (such as death of a family member or friend) or financial or work stresses;
- Medical conditions, particularly chronic ones, associated with pain, breathlessness, anxiety, physical impediment, or other sleep disorders;
- Some medications;
- Excessive caffeine, nicotine (cigarettes) or alcohol can interfere with sleep onset or the return of sleep;
- Psychiatric conditions such as depression and anxiety.

Whatever the initial cause of the insomnia, even when the specific trigger has been resolved the individual is often left with a pattern of thinking and worrying in bed at night or thinking and worrying about their poor sleep patterns during the daytime, which perpetuates the problem. This pattern of thinking can result in a fear of going to bed and a fear of not sleeping. Bed becomes a place of wakefulness and paradoxically the individual often then allows herself/himself more time in bed to worry and be awake which further aggravates the problem. Changing these patterns is challenging.

Consequences of Insomnia

Insomnia sufferers generally feel fatigued, lack energy, are irritable and often struggle at work with complex tasks requiring concentration. Memory is also impaired. However the irony of insomnia is that at bedtime the individual usually feels tired but frustratingly unable to readily achieve sleep. Untreated insomnia is associated with the onset or exacerbation of mood disorders such as anxiety and depression.

Management of Insomnia

Research shows that early intervention helps prevent insomnia from being a chronic condition. Hence a visit to the GP to discuss insomnia is sensible if the symptoms persist beyond several days.

<u>Sleep Diary</u>

A sleep diary recording sleep patterns over 2 to 3 weeks is helpful in characterising the insomnia and sorting out its cause. The diary should include details such as time of going to bed; time of lights out; time to fall asleep; length of time asleep; number of wakes and length of wakes. It is also useful to record caffeine intake, alcohol, exercise, and medications. The diary should also record daytime naps including their frequency, duration and timing.

<u>Sedative medications</u>

Sedatives can be useful in cases of transient insomnia but are of limited use longer term as they:

- do not address the cause of the sleeping problem;
- may have daytime hangover effects with drowsiness and inattentiveness increasing vulnerability to accidents on the road or at home or work;
- lead to tolerance with continued use (after 4 weeks) such that the tablets become less effective with increasing dose requirement and/or reduced confidence in the ability to achieve or return to sleep;
- cause rebound insomnia on withdrawal, which increases psychological dependence on them;
- can produce a state of physical dependence with withdrawal symptoms if ceased.

Using medications to aid insomnia only masks the problem and those people who are in the habit of having an afternoon nap and trying to sleep in on the weekend may only reinforce the cycle of poor sleeping patterns.

Non-pharmacological Treatments

The primary goal of insomnia management is to break the vicious cycle of sleep difficulties and loss of confidence in ability to sleep that maintains the bad sleep pattern. Changing behaviour and thinking is an integral part of this. These strategies listed below have been shown to improve sleep quality more than sleeping tablets alone.

Start with the morning - getting up guarantees the end of the sleep period but going to bed at the same time does not guarantee the onset of sleep. Get up at the same time each day no matter what the previous night's sleep has been like. Get outside into sunlight for around 40 minutes to help start the day as light is stimulating and one of the main time-givers to the body clock.

Restrict time in bed to the time that is spent sleeping. While this is known as "sleep restriction" it is really bed restriction. Accumulating a sleep debt increases the homeostatic pressure for sleep whereas spending too long in bed can lead to periods of wakefulness between the periods of sleep. Sleep restriction helps by increasing the pressure for sleep and reducing this sleep fragmentation. The following instructions are helpful:

- From a diary of your sleep work out your average actual sleep time over a number of nights;
- Reduce the time you spend in bed to the number of hours you are sleeping by going to bed later, getting up earlier, or a combination of these;
- While a little difficult at first it helps you to build up a sleep debt which favours better less fragmented sleep overnight.

Take all the things that promote wakefulness from the bed and bedroom. This is called "stimulus control therapy" or the ¼ hour rule. If unable to achieve sleep or re-achieve sleep (after awakening) within about ¼ of an hour then:

- Get up and go to another room which has minimal or no light and do something that is boring/non stimulating;
- Avoid watching television; working on the computer; texting; phoning or catching up with household tasks;
- Go back to bed when comfortable or even a little sleepy;
- When first starting this strategy it may be necessary to do it many times a night for a number of nights. Persistence is the key.

Deal better with thoughts about sleep. Making poor quality sleep the centre of life puts more pressure on an individual and makes sleep worse. Negative thoughts about sleep are self reinforcing - "how you think is how you feel!"

- Psychological assistance with stress management, relaxation and controlling thoughts is both very effective and helpful;
- Learning about sleep and sleep staging, the role of light and darkness and other environmental factors will also help with understanding how better quality sleep can be achieved;
- Learning to have "time out" and doing something that is relaxing and allows down time are important components of getting a better sleep.

For those individuals taking sleeping tablets it is better to slowly reduce the amount being taken over a number of nights or weeks. Stopping sleeping medication can result in temporary worsening of sleep, particularly if done too quickly. Using the other techniques described above make it easier to reduce medication usage.

A list of names and contact details of some health professionals who are members of the Australasian Sleep Association and specialise in insomnia management is available on the ASA website. www.sleep.org.au

SNORING AND THE SLEEP APNOEA SYNDROMES

SNORING

Snoring is generated by vibration of the walls of the upper airway. Structures that can vibrate include the soft palate, uvula, oropharynx, and the base of the tongue. Snoring is very common in the community with 30-40% of adults snoring regularly. It affects twice as many males as females. Children can also snore, generally because of airway narrowing caused by enlarged tonsils. In adults it can be socially disruptive and adversely affect the sleep quality of bed partners.

Snoring occurs in the presence of a narrow floppy upper airway. If these problems are sufficiently severe during sleep then not only will snoring (vibration) be present, but the upper airway will tend to obstruct – either partially or completely. This is the basis of **obstructive sleep apnoea (OSA)** (see below). Many snorers do not have OSA, but most OSA sufferers snore.

Management of Snoring:

First it is important to exclude the possibility that the snorer also has OSA (see below), and second is to assess the impact of the snoring on the bed partner!

Lifestyle Changes: These include weight loss as fat tissue around the neck reduces space and increases collapsibility of the airway. Exercise helps individuals to feel better and reduce their weight. Reducing alcohol especially close to bedtime will also decrease snoring.

Other Adjuncts: Avoiding sleep in the supine posture (flat on the back) can be helpful. Nasal sprays (decongestants) and nasal steroids may also assist. A dental appliance known as a Mandibular Advancement Device can be very effective (see below under OSA) but requires a medical and dental assessment in order to be prescribed and fitted correctly.

OBSTRUCTIVE SLEEP APNOEA (OSA)

The Nature of OSA

OSA is a condition during sleep where there are repetitive episodes of partial or complete obstruction of the upper airway during sleep. This results from the combined effects of a narrow airway and the sleep associated relaxation of loss of muscle tone tending to narrow the airway further. The obstruction is only relieved when sleep is momentarily interrupted by an arousal with temporary

return of muscle activity. The arousal is usually so brief (less than 15 seconds) that the individual has no memory of it. Resumption of sleep after such an arousal is accompanied by muscle relaxation and repetition of the process with hundreds of partial or complete obstructions occurring overnight in more severe cases. In more subtle cases it may only occur when sleeping supine (flat on the back) or during rapid eye movement sleep (the phase of sleep where muscle relaxation is most profound.) The result of these repetitive events is often severe disruption of sleep (even when there is no memory of the overnight arousals) so that sleep is not refreshing and excessive daytime sleepiness is present. The repetitive obstructive events also stress the body and common accompaniments include high blood pressure and increased risk of heart attacks, strokes, diabetes, and depression.

A Common Condition
OSA is common with approximately 7% of adults having it to a moderate degree although it causes significant symptoms in only about one half of these. It is more common in men, but women become increasingly prone after menopause. It is also common in children.

Risk Factors
Predisposing factors include obesity, facial features such as a small receding jaw, nasal obstruction, a large tongue and (in children particularly) big tonsils and adenoids.

Symptoms
Adults tend to present with excessive daytime sleepiness whilst children with OSA often present with hyperactivity and learning difficulties.

Other symptoms in adults relate to waking from sleep with a choking sensation or snorting/gasping sounds as reported by bed partner; waking frequently to pass urine; restless sleep; unrefreshing sleep; morning headaches; loss of libido; erectile dysfunction; depressive symptoms and feelings of isolation; tiredness and lethargy; difficulties concentrating; impaired memory; poor daytime functioning at work; and falling asleep episodes in the car.

Assessment of OSA
- Assessment involves both the GP and the Sleep Specialist. A comprehensive history is required regarding snoring, stopping breathing episodes as reported by bed partner, daytime sleepiness; weight gain; family history and lifestyle factors including alcohol consumption. If a GP believes the patient may have OSA he/she will normally refer a patient to a Sleep Specialist;
- An overnight Sleep Study is required to diagnose the problem and quantify its severity. In adults OSA is regarded as mild where there are 5 to 15 partial or complete obstructive events per hour or sleep; moderate between 15 and 30 events per hour and severe where there are more than 30 events per hour;
- Simpler studies may be performed at home but often a comprehensive sleep laboratory study, or Polysomnography (PSG), is needed. This requires the individual to stay overnight in a sleep laboratory where brain electrical activity is measured in relation to breathing.

Treatment of OSA

***Lifestyle*:** Lifestyle issues are important such as weight loss, smoking and reduction in alcohol and sedative intake.

Continuous Positive Airway Pressure (CPAP): is the most effective treatment we have at present for OSA. It involves administration of air under low pressure from a pump via a mask that fits over the nose or the nose and mouth. This pressurised air provides an air cushion that 'splints' the airway open, stopping it from collapsing. It is much quieter than the snoring that it prevents and is highly effective in abolishing the obstructions and therefore the sleep disruption and excessive daytime sleepiness. Many patients report being "awake" for the first time in years after using CPAP. It does however take some time to get used to and often requires a little persistence. It is important to get help where there are any problems getting settled on treatment.

Mandibular Advancement Device: is a dental device that holds the lower jaw forward during sleep. This tends to displace the tongue and soft tissues of the front of the throat forward, increasing the size of the airway, which counteracts the tendency to snoring and obstruction. These devices are not as predictably effective as CPAP, tending to be best suited for individuals with mild to moderate OSA. They are a good back up for individuals who are not able to use CPAP. An experienced trained dentist is required to fit and monitor these devices.

Ear Nose Throat Assessment: Surgery is a good option where a specific abnormality exists that is amenable to surgery such as enlarged tonsils and adenoids. Hence it is a mainstay of treatment in children. However surgery is less effective in most adults.

CENTRAL SLEEP APNOEA (CSA):

Central Sleep Apnoea is less common than OSA. CSA is when the individual 'forgets to breathe' due to a lack of effort to breathe without any obstruction of the airway. It occurs in severe heart failure and in a number of less common conditions.

Symptoms of CSA: are similar to OSA without the snoring and stopping breathing episodes.

Treatment of CSA: tends to be more complex and requires cardiac and sleep physician management.

Some individuals may have both OSA and CSA, a combination often referred to as "complex sleep apnoea".

RESTLESS LEGS SYNDROME AND PERIODIC LIMB MOVEMENT DISORDER

Restless Legs Syndrome (RLS) and its sleep equivalent, Periodic Limb Movement Disorder (PLMD) are another common cause of disrupted sleep and excessive daytime sleepiness, affecting around 1.5% of the population to a significant degree. This percentage increases with age.

RLS is characterised by an uncontrollable desire to move the legs (and sometimes arms) which is only relieved by getting up and moving around. It has a strong relationship to time of day, being worst in the evening through to the very early hours of the morning, then tending to settle. It can be responsible for insomnia because of its disruptive effects. Once asleep the abnormal limb movements tend to continue, except in rapid eye movement sleep where the muscles are profoundly relaxed. The disruptions to sleep that these movements can cause are responsible for the daytime sleepiness that accompanies the problem.

Iron deficiency is a predisposing factor and should always be considered as a cause. Where this has been done and problems persist then a variety of other approaches can help. Some find magnesium supplements helpful. Beyond these low doses of drugs that are also used to treat Parkinson's disease (an unrelated movement disorder) can be highly effective in dealing with it.

SLEEP DISORDERS ARE EXPENSIVE

Disrupted sleep causes dangerous and disabling daytime sleepiness and inattention in many individuals and the conditions described here are associated with other health issues, such as the association between untreated OSA, high blood pressure, heart attacks and strokes.

Access Economics, the respected national economic consultancy, estimated that in 2004 the cost of untreated sleep disorders to the Australian Community exceeded $10 billion per annum, yet only $200 million is spent in direct health costs to identify and treat them. Many cases remain undiagnosed in our community and the Sleep Health Foundation is dedicated, through efforts such as this brochure, to bringing these problems to the attention of individuals and the community for the common good.

TIPS FOR A GOOD NIGHT'S SLEEP

- Ensure regular sleep patterns by giving yourself time to sleep each night and aiming for around eight hours a night.
- If you are feeling stressed or have lots of problems – stay out of bed until you have at least partially resolved some of these issues. Thinking/worrying WILL keep you awake. A good sleeper does not think in bed he/she just sleeps!
- Get up at the same time during the working week and have some early morning light. You could combine these and have a walk or cycle and it will help your sleep and start the day in a healthy way.
- Learn how to relax. Stress is a major cause of insomnia so find a relaxation technique that works for you. Learning to "let go" of daytime issues/worries will also help.
- Limit alcohol and caffeine intake
- Avoid spending time in bed attempting to catch up on sleep when you are having any sleeping difficulties - this pattern will only make your sleep worse. Match your time in bed to the time you normally spend asleep.
- Avoid sleeping pills. They don't address the cause of the sleeping problem
- Improve your sleeping environment. Make it dark, quiet and comfortable and a place that you look forward to being in.
- Resist the temptation to nap late in the afternoon or evening, but a nap before 2pm sometimes is okay. If you do nap only give yourself a 20 minute opportunity to nap. A short nap early in the day will generally not reduce your sleep drive at night.
- Seek professional help when you suffer symptoms of mood swings, restless sleep, snoring and feeling unrefreshed on waking despite adequate length sleep.

This information is produced by:

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