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The information contained herein includes both psychological and non psychological interventions. The delivery of psychological services requires a medical referral whilst non psychological services do not.

Each person is an individual and has a unique psychological profile, biochemistry, developmental and social history. As such, advice will not be given over the internet and recommendations and interventions within this website cannot be taken as a substitute for a thorough medical or allied health professional assessment or diagnosis.

Date Document Updated : May 2010

ARTICLE 1

What is Sleep?

Article QUICK LINKS :

ARTICLE 2

Nocturnal Enuresis – Bed Wetting

Article QUICK LINKS :

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What Is Sleep?

ARTICLE 1

Article QUICK LINKS :

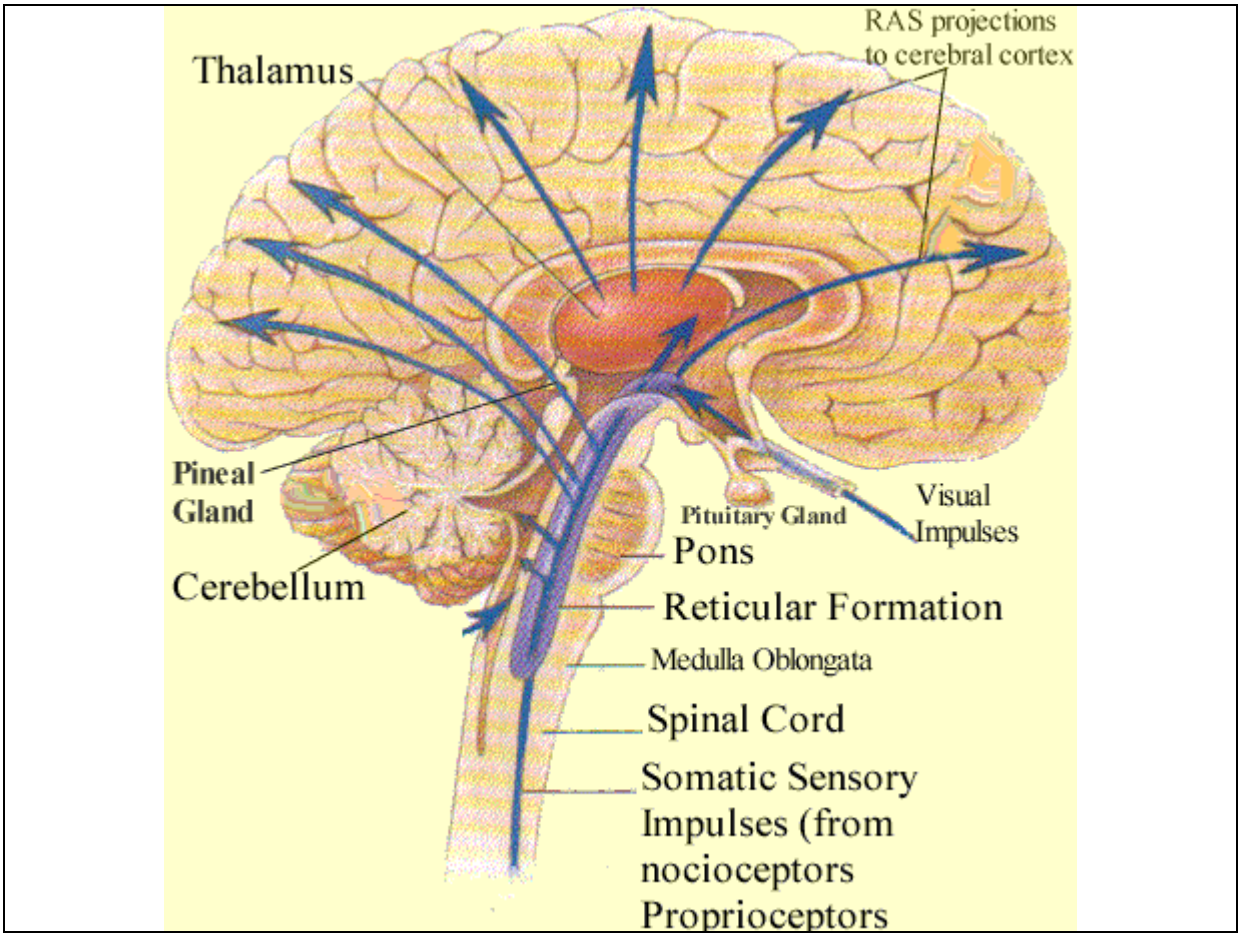
INTRODUCTION

Sleep is an integral part of human existence, and we spend around one third of our total lives doing it.

It is defined in the Stedmans Medical Dictionary as "A physiologic state of relative unconsciousness and inaction of the voluntary muscles, the need for which recurs periodically". Totora and Grabowski in Principles of Anatomy and Physiology add that "it is a state of unconsciousness from which a person can be aroused; associated with a low level of activity in the reticular activating system".

Sleep and waking are two opposite states of being which compete for consciousness. Wakefulness is maintained by the Reticular Activating System. (RAS) assisted by the catecholaminergic and cholinergic transmitter systems. Sleep is promoted by the activity of the dorsal raphe which acts with other structures to deactivate the RAS. Serotonogenic neurons dampen down sensory activity and inhibit motor activity during sleep, promoting slow wave activity of the cortex. (Culebras 1992)

The reticular activating system (RAS) comprises parts of the medulla oblongata, the pons and midbrain and receives sensory input from the auditory and vestibular apparatus; the eyes, and somatosensory impulses (nocioreceptors, proprioceptors and touch receptors). When the reticular formation (that is, the parts of the RAS) are active, nerve impulses pass upward to widespread areas of the cerebral cortex, both directly and via the thalamus effecting a generalised increase in cortical activity associated with waking or consciousness. The RAS does not receive input from the olfactory nerves (sense of smell) hence, people do not awaken with the smell of smoke during a fire.



Our individual cycles of sleep are closely tied to our *circadian rhythms*, or daily variations in physiology including body temperature. These rhythms are aligned to our environment, and vary with the season as well as throughout the life cycle. Many creatures possess a pineal gland, which scientists believe to be a kind of 'natural clock', helping us to synchronise our activities with nature. In humans, the pineal gland is a tiny pine-cone shaped gland attached to the roof of the third ventricle deep within the brain and weighs between 0.1-0.2 grams.

The pineal gland helps govern our circadian rhythms, those biological rhythms which take place over a 24-hour day, such as the sleep-wake cycle. It uses melatonin, a hormone secreted by the pineal gland during sleep - normally 'the dark' cycle of the day, as a messenger to communicate with these other systems via the suprachiasmatic nucleus of the hypothalamus. Melatonin production is inhibited by light and the release of norepinephrine, an important neurotransmitter, which is why something as innocuous as the LED of your electric alarm clock could actually be disrupting your sleep. The pineal gland then, helps control what time we eat and rest, our production of natural hormones, changes in body temperature, our immune system and many other body functions, and may be one of the reasons why it feels "natural'' to sleep at night. It coordinates and controls our other hormone-release and immune responses.

Sleep is not just a matter of simply switching off the brain, it is a complex process involving several stages of deep and light sleep that occur over a full sleep cycle of around eight hours for most adults. Most people need about 7 to 8 hours sleep per night to stay alert through the day. The actual range of needed sleep varies considerably between individuals, and sleeping patterns appear to differ across cultures. In today's fast paced lifestyle, many people are sleep deprived. Some of the warning signs of sleep deprivation include fatigue, irritability, difficulty concentrating, confusion and depression.

As we grow older, from about middle age (35) onwards, our sleep tends to become less and less deep, and this factor appears to be directly related to reduction in melatonin production. Deep sleep is the stage when our body healing, repair and regeneration occurs. These latter stages of the sleep cycle are crucial times for physical recovery and psychological well being. It is also when the body secretes the most growth hormone, amongst other chemicals.

It is the quality of sleep that influences our physical, psychological and social well being, and many people suffer from a sleep disturbance which may be comprised of a broad range of problems.

One factor often ignored in sleep disorders is the presence of Electro Magnetic Fields (EMFs). Minimising exposure to these fields may be of benefit in up to 64% of people suffering from sleep disorders. See the article "Changes in Health Status in a Group of CFS and CF Patients Following Removal of Excessive 50 Hz Magnetic Field Exposure" by Maish, Podd & Rapley, (2002) for further information on the influence of EMFs on sleep. Ask us about how to monitor and reduce your exposure by telephoning the clinic on (02) 9637 9998 during business hours.

An interrupted sleep cycle with insufficient Rapid Eye Movement (REM) Periods of sleep can be at root of many physical and psychological effects such as fatigue, inability to concentrate, dizziness, perceptual changes and mood changes. Many sleep disorders cause an increase in daytime sleepiness and there is a direct correlation to an increase in motor vehicle accidents.

The sleep disorders have been connected to attentional and cognitive deficits, which are most commonly observed in the areas of attention and tasks of high level integration such as solutions of problems in arithmetic. Studies have shown that improvements of sleep patterns lead to improvements in function and cognition.

STAGES OF THE SLEEP CYCLE

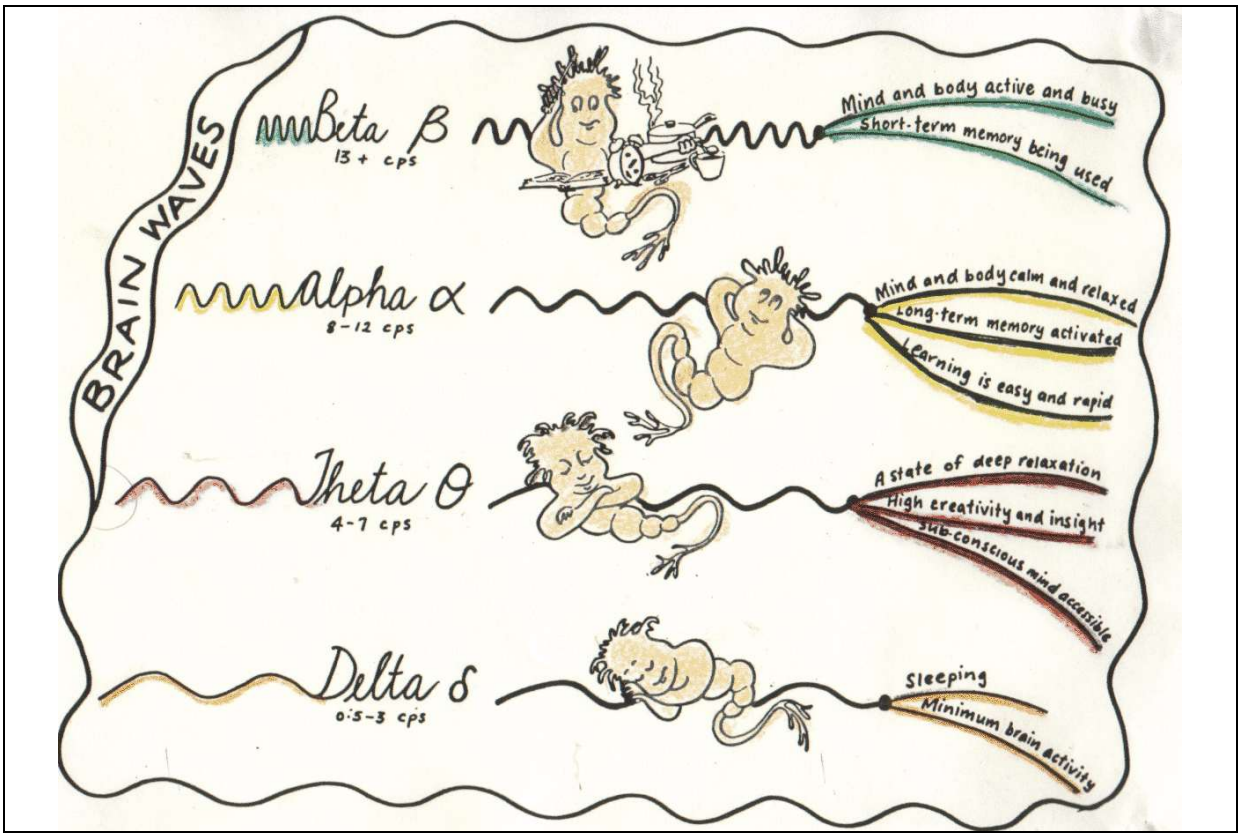
Dement and Klietman (1957) classified sleep into four distinct stages:

Stage 1 Sleep or onset is characterised by low voltage random EEG activity. This is the transitionary stage between wakefulness and sleep and last between 1 and 7 minutes. (People wakened at this stage of sleep will often say that they have not been sleeping).

Stage 2 Sleep or light sleep is categorised by an irregular EEG pattern with 12-14 Hz (alpha) "sleep spindles" and the "K complex" - a 75uV burst of EEG activity. This is really the first stage of 'true' sleep. The person is a little more difficult to awaken. Here, fragments of dreams may be experienced, and the eyes may slowly roll from side to side.

Stage 3 Sleep shows alternate fast activity, low voltage waves and large slow waves (delta - 0.5-3.0 Hz). This is a period of moderately deep sleep which occurs approximately 20 minutes after first falling asleep. Body temperature and blood pressure decrease, and the person is difficult to awaken.

Stage 4 Sleep is comprised of the "K complex" wave and is present in more than 50% of the epoch (20-30 seconds of unit measurement). This is the deepest level of sleep. Most reflexes are intact, although the person will respond very slowly upon awakening. When sleepwalking occurs, this is the stage that it does so. Here we find REM or the Rapid Eye Movement stages followed by Non-REM (NREM) which comprises a combination of Stages 1,2,3 and 4 but no rapid eye movements.



Typical Brain Wave Activity (cps=cycles per second)

Typically, the person goes from Stage 1 to Stage 4 NREM sleep in less than an hour. A person has 3-5 episodes of REM sleep in each 7-8 hour sleep period, and the autonomic nervous system becomes more active during REM sleep. It has been found that during REM, our brain uses up to 20% more oxygen, more than it does during intense physical activity while awake.

REMs were found to be associated with vivid dreaming (Aserinsky and Klietman 1953). The presence of REMs alone is not sufficient to denote the presence of dreaming, but the activity appears to coincide with the emergent Stage 1 of a new sleep cycle.

A person goes through these stages of sleep many times a night, and a full cycle from, Stage 1 back to Stage 1 again takes approximately 90-100 minutes (Dement and Klietman 1957), but Stages 3 and 4 occur more rarely as sleep progresses. That is, the person sleeps more lightly as the end of the sleep period approaches. Dreaming then, occurs approximately four times per night, and if awakening occurs during the REM Stage, we remember our dreams.

It is interesting to note that researchers have observed that the newborn infant spends around 50% of its time in REM, and premature infants as much as 75%. A child of 2 years has 35% REM sleep, whilst an adult usually has around 25%. The higher proportion of REM sleep in infants is thought to be important for brain maturation.

Over a prolonged period, lack of REM sleep can cause serious illness and premature ageing. Most important in maintaining quality REM sleep throughout the lifetime is maintaining consistency and regularity of the sleeping period, getting into the habit of retiring at a specific time each night and awakening (without the use of an alarm clock ideally) at a specific time each morning.

Day time sleep differs from night time sleep, but a permanent night work schedule appears to allow the body to adjust.

Sleep has been studied extensively by researchers and clinical research has revealed that there are more than 80 sleeping disorders. Some of the more common ones are listed below.

Many people resort to prescription or over the counter sleeping medications and preparations, but these do not cure sleeping disorders, and they interfere with the quality of REM sleep. There *are* natural solutions to these common and debilitating sleep disruptions, and by enhancing your sleeping hours naturally, your waking ones will improve as well.

COMMON SLEEP DISORDERS

Obstructive Sleep Apnoea (OSA)

OSA can be the most serious of the sleep disorders, it is periodic obstruction of the upper airway during sleep and has a prevalence rate of 3% to 8%. Periods of apnoea may last up to 90 seconds and can occur several hundred times per night. OSA is the most common medical cause of excessive daytime sleepiness and tends to be more common in men. It most often occurs due to a loss of muscle tone in pharyngeal muscles which allows the airway to collapse.

Symptoms of Obstructive Sleep Apnoea (OSA) are listed below.

- Loud, habitual snoring
- Pauses in breathing during sleep
- Daytime sleepiness
- Irritability/Personality changes
- Obesity
- Choking/Gasping/snorts during sleep
- Hypertension
- Non-refreshing sleep/inability to wake up
- Daytime fatigue
- Memory and concentration problems
- Morning headaches
- Upper airway abnormalities
- Frequent napping
- Nocturnal Angina/Arrhythmias
- Frequent awakenings
- Sexual problems

Diagnosis for Obstructive Sleep Apnoea should be made by pertinent history, physical examination, oximetry and polysomnography. Most people will benefit from appropriate evaluation, intervention and follow-up.

Narcolepsy

Narcolepsy has a prevalence rate of five per 100,000 population. It is a condition in which REM sleep cannot be inhibited during waking periods. As a result, involuntary periods of sleep lasting about 15 minutes occur throughout the day.

Classical symptoms of narcolepsy include:

- Excessive sleepiness
- Cataplexy (physical weakness with emotion)
- Hypnagogic hallucinations
- Sleep paralysis (occurs upon waking)
- Automatic behavior
- Low concentration
- Occupational/School problems

Symptoms may appear rapidly or develop slowly over the years. The cause of narcolepsy is still unknown but shows strong familial clustering.

Periodic Limb Movements (PLM)

PLM is characterised by rhythmic jerking of the feet or legs. Restless Legs Syndrome (RLS) is described as a "creeping, crawling" sensation that creates an urge to move the legs. Its prevalence rate is two to five percent. People with PLM or RLS often complain of the following symptoms.

- "Creepy" or "jumpy" legs
- Unpleasant sensation during sleep
- Insomnia/Non-refreshing sleep
- Excessive daytime sleepiness
- Increased activity
- Restless sleep

Intervention for Restless Legs Syndrome and Periodic Limb Movements is highly effective for 90 percent of patients seeking help.

Insomnia

Insomnia in its chronic form, affects approximately nine percent of the population. It manifests as a difficulty in falling asleep and staying asleep, and failure to get an entire nights sleep on most nights over a one month period, and most often is classified as 'habitual' sleeplessness. Most often, insomnia is a symptom of an underlying disorder. It can last for weeks, months, or even years and may be related to the following:

- Worry, anxiety or stress
- Psychological problems
- Primary sleep disorders
- Substance abuse
- Nutritional deficiency
- Behavioural / Environmental factors
- A sedentary lifestyle

Those with chronic insomnia may experience reduced productivity and accidents as a result of fatigue. Because insomnia is a symptom, the health care professional must search for the cause. Over 70 percent of insomnia sufferers sleep better after appropriate evaluation and intervention.

Parasomnia

Parasomnia refers to a wide variety of disruptive, sleep-related events or "disorders of arousal." These arousal disorders include:

- Sleep Walking
- Sleep terrors (pavor nocturnes)
- Nightmares
- Partial seizures
- Violent behaviour during sleep
- REM behaviour disorder (acting out dreams)

Severe cases may lead to injury, violence, excessive eating, or disturbance of others in the bed or house. In most cases, Parasomnia can be effectively diagnosed and ameliorated.

CHILDREN'S SLEEP DISORDERS

Children are subject to sleep disorders too and they can be affected at many levels. The disorder(s) themselves may be indicative of other problems.

Some more common sleep disorders affecting children:

- Nightmares
- Night terrors
- Waking often during the night
- Lying awake
- Feeling tired during the day
- Waking early
- Sleep walking

What is a night terror?

- A night terror is not the same as a nightmare.
- Nightmares happen during dream sleep. Night terrors happen while your child is asleep, but before he begins dream sleep.
- After a nightmare, children wake up with scary memories of a bad dream.
- After a night terror, children may feel scared but they will not remember why.
- Your child's eyes may open during the terror, but he/she is still asleep.
- Night terrors can last a few minutes or up to an hour.
- Children usually have them at about the same time each night, within the first few hours of sleep.
- Night terrors can frighten both parents and children but they are not physically harmful.
- Night terrors are dangerous only if your child gets out of bed during one. Keep your child in bed so he does not get hurt. Hold him if needed.
- Sleep walking is similar to night terrors. The child may appear awake but is not. It also runs in families. Hold your child so he does not get hurt.
- Night terrors and sleep walking affect more boys than girls.

What causes sleep problems?

- Children who have night terrors may be overly tired or under stress.
- Children who do not have a bedtime routine could have sleep problems.
- Some children may not want to go to bed because of separation anxiety (they do not like to be away from loved ones).

Who can have sleep problems?

- Night terrors and sleep walking tend to run in families. For example, if the child's mother or father had night terrors, the child will likely have them, too.
- Night terrors usually happen between the ages of 4 and 12.
- Sleep walking usually happens between the ages of 6 and 12.
- Nightmares tend to affect more girls than boys.
- Children under stress, children with ADHD, and children affected by substance abuse or mood disorders may have trouble sleeping.

How long will the problem last?

- It is normal for a child to have sleep problems every once in awhile.
- If your child has sleep problems, such as night terrors, many times a night or almost every night for a long period of time, seek professional help.
- Children usually grow out of their sleep problems.

See also Children's Anxiety in the article Anxiety Disorders

There are many natural interventions which can help people to sleep better. These include counselling, guidance and education, dietary guidelines, nutritional supplements, SAMONAS Sound therapy (via bone conduction for sleep apnoea), EEG Biofeedback and Alpha-Theta, and Hypnotherapy. Different combinations of the above interventions devised to cater for individual needs have been successful with a range of sleeping problems.

For more information or to make an appointment please contact us on (02) 9637 9998 during business hours.

FURTHER READING SUGGESTIONS

- Depression
- Changes in Health Status in a Group of CFS and CF Patients Following Removal of Excessive 50 Hz Magnetic Field Exposure
- Anxiety

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Nocturnal Enuresis – Bed Wetting

ARTICLE 2

Article QUICK LINKS :

What Is Nocturnal Enuresis? / Prevalence / What Causes Enuresis? / What Interventions are available? / Conclusion / References

WHAT IS NOCTURNAL ENURESIS?

Nocturnal Enuresis is persistent bed wetting without accountable organic pathology after the age of 4-5 years. It is generally divided into two types - *primary enuresis* where there is no sustained period of dryness, and *secondary enuresis* where there is a period of lengthy sustained dryness (3-6 months) without intervention.

Most children are toilet trained for daytime between the ages of 2 1/2 to 5 years, and night training usually follows around six months later.

PREVALENCE

It is estimated that 15-20% of children wet their beds at age 5, about 5% at age 10, 2-3% at age 14 and 1-2% in young adulthood. It is slightly more common in younger males than females, but the ratio increases to 2:1 around age 11.

It is thought that about 15% of children wetting between the ages of 5-19 years will become dry within a year without intervention. This increases to around a 45% chance of becoming dry over a 5 year period.

Deferring intervention can have profound psychological ramifications and is not advisable for school age children and adolescents. There is hope.

WHAT CAUSES ENURESIS?

There are many theories as to what causes enuresis.

Genetic and/or familial factors play an important part for many children. When both parents have, or have had enuresis, there is a higher chance that their children will. Underlying emotional disturbances, behavioural (ADHD, Dyspraxia etc.) and Learning Difficulties (Children who are slow in reaching other milestones may take longer to stay dry at night.) are all considerations.

Sleep depth and/or arousal levels (85-95% of enuresis occurs during NREM [Non Rapid Eye Movement] stages of sleep, but studies by Sharf and Jennings, 1988, indicated that enuresis is more related to the time of night than sleep stage); a small bladder capacity; nocturnal polyuria (Increased urination during sleep because of overproduction of urine as the kidneys are not properly concentrating the urine.); and dysfunctional detrusor muscle (the muscle surrounding the bladder);or dysfunctional perineal muscles (the muscles which form the pelvic floor and are used for 'holding') may all be contributing factors. Stress and illness may also play a significant part.

It is important that a full familial, as well as medical history and workup be undertaken, including urology, a functional QEEG (Quantified Electroencephalogram or brain wave study), and testing for retained reflexes.

WHAT INTERVENTIONS ARE AVAILABLE?

It should be noted that each and every person is unique. Sleep enuresis may best be described as a biobehavioural problem requiring consideration of multifarious biochemical, physiological and learning theory variables. Many factors will need to be examined before suggesting which interventional modality will be suitable in each instance.

ALARMS

The 'night alarm' is generally the most popular choice, and has been in use for the past 60 years. There are many different kinds on the market. Most have a sensor which sets off an alarm as soon as the child begins to wet the bed. Progress is usually very slow, and interrupted sleep patterns may exacerbate the problem or cause others.

MEDICATION

Medication produces side effects, is expensive, and will not help all children. Drugs are not a cure for enuresis, and wetting will resume when treatment has stopped. Drugs should only be used in the most extenuating of circumstances such as night time sleepovers, camp and the like, - that is, when the psychological benefit of use outweighs the risks of side effects. You will need to discuss this with your health care professional.

EXERCISES

Bladder stretching exercises and muscle strengthening techniques may be suggested. Talk to your health care professional before undertaking these.

NEURODEVLOPMENTAL THERAPY

Exercises and training for inhibition of retained reflexes to address problems associated with neurodevelopmental delay.

SOUND THERAPY

Samonas Sound Therapy with applied bone conduction has been very successful in many instances of enuresis.

BOWEN THERAPY

The Bowen Technique offers specific protocols for enuresis and many other childhood problems. Properly administered by a trained practitioner, it has a good track record with enuresis, and is gentle enough for use with all ages.

EEG BIOFEEDBACK

If the enuresis has a level of arousal, behavioural or a psychological basis, then EEG biofeedback can help.

DIETARY

Elimination of specific foods and adherence to dietary guidelines and supplementation has been of benefit to most people with enuresis.

CONCLUSION

Experience has shown that the most successful interventions for enuresis are individualised programmes tailored to the person's unique needs and comprise multiple interventional methods applied synergistically to address the whole person - not just the symptom. Whichever methods are decided upon, behavioural and learning techniques will need to be applied in conjunction to the chosen mode of intervention.

The programme is intensive and may be demanding for many people, but has shown long term benefits both for the enuresis and on the family levels in the shortest timeframe.

For more information or to make an appointment please contact us on (02) 9637 9998 during business hours.

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