

www.spinabifida.org for more on spina bifida and hydrocephalus

Information Sheet

Sleep Apnoea

Based on a presentation by Dr. Chris Seton, Consultant Paediatrician and Director of the Sleep Unit, Royal Alexandra Hospital for Children, Camperdown, Sydney. Given at the 8th International Conference in Sydney September 1995.

Abnormal breathing occurs commonly in children with spina bifida. Children with abnormal breathing are considerably more compromised, ie. have more difficulties in sleep than when they are awake.

This is partly because in deep sleep, and even more so in **REM** (rapid eye movement) sleep, the muscle tone is very low in many respiratory muscles, including those in the upper airway.

Abnormal sleep breathing can be seen in relationship to hydrocephalus, Arnold Chiari malformation, syringomyelia and myelomeningocele.

Problems which can occur include:

1. Central hypoventilation (under - breathing because of poor control from the breathing centre in the brainstem).

2. Obstructive apnoeas (periods of not breathing because of obstruction or blockage in the airway).

3. Central apnoeas (periods of not breathing because of poor control from the brainstem).

4. Mixed approves (a combination of (2) and (3).

If a child is having sleep - breathing problems, then the oxygen level drops too low, the child will wake up, so that he has more control over his breathing and can get more oxygen. This occurs most in **REM** sleep, which is when some respiratory muscles are most relaxed. **REM** sleep is also the sleep which is most important for brain function.

Therefore, if a child keeps waking up each time he falls into **REM** sleep, he is missing out on the most important sleep of all.

21 Tillot St	PO Box 8022	Telephone (07) 3844 4600
Dutton Park, Qld 4102	Woolloongabba, Qld 4102	Fax (07) 3844 4601
Australia	Australia	Email info@sbhqueensland.org.au

Sleep studies, or polysomnography, is an all night study of what happens during a child's sleep.

Night symptoms of obstructive apnoea may include snoring, apnoea, blue spells, restlessness, and perspiration.

Daytime symptoms may be lethargy/sleepiness, poor appetite, short concentration span, deteriorating school performance.

In sleep studies, numerous factors are looked at, including **EEG** (brain waves), **EMG** (muscle activity), **ECG** (heart rate), airflow through nose, oxygen levels, and others. If it is found that a child has significant obstructive apnoea at night such that he is waking up many times per hour, the first treatment is often to have tonsils and adenoids removed.

If the obstructive apnoea persists, the relatively new treatment of nasal continuous positive airways pressure (**nCPAP**) may be considered. This involves the use of a nasal mask, through which continuous compressed air is delivered into the nose. This provides slight positive pressure to help keep the airway open.

In the children studied at Camperdown, the use of nasal **CPAP** significantly reduced the number of apnoeas and sleep

disturbances. The amount of **REM** sleep increased significantly. (On average a baby normally spends about 25% of sleep in **REM** sleep, but this is much higher in a newborn, and decreases as the child grows older).

Also growth, which is dependent on deep sleep or slow wave sleep, improved in some cases quite dramatically.

In conclusion, the use of nasal **CPAP** at home has proved very successful in improving sleep and therefore hopefully improving other areas of a child's performance, in those children with spina bifida with whom it has been trialed.