

## Submission From British Sleep Society

### NICE Technology appraisal of Continuous Positive Airway Pressure (CPAP) for the treatment of Obstructive Sleep Apnoea Hypopnoea Syndrome (OSAHS)

British Sleep Society (BSS)  
PO Box 247,  
Colne,  
Huntingdon,  
PE28 3UZ

Obstructive Sleep Apnoea Syndrome is a medical condition in which the upper airway repeatedly narrows or completely collapses during sleep<sup>1</sup>. Changes in the breathing pattern occur with reduced breaths when narrowing occurs called Hypopnoeas, to cessation of breathing, called Apnoeas, when complete closure of the upper airway occurs. There are recurrent drops in the level of oxygen and micro- arousals due to this interruption of breathing that disturb the quality of sleep. This can occur many hundreds of times through the night and leads to sleep fragmentation and a reduction in the quality of sleep. The patient is often not aware of the changes and is sleepy and tired in their wake time. Alertness and concentration are therefore impaired and the patient may suffer reduced performance at work, home and whilst doing tasks such as driving<sup>2</sup>.

Obstructive Sleep Apnoea Syndrome (OSAS) is the combination of breathing reduction or cessation and waketime sleepiness.

#### *Prevalence*

Epidemiology studies suggest that 1% of adult males and 0.25 to 0.5% of adult females in the United Kingdom have severe OSAS<sup>3</sup>. Approximately two thirds of patients with OSAS are overweight and the general tendency for an increase of BMI will be likely to increase the prevalence of OSAS in the Western world. There is a similar pattern noticed for the increase in prevalence of Type Two diabetes. Estimates suggest that only between 10 to 20 % of people with OSAS have been identified.

#### *Severity*

The disability level in most patients can be estimated using the amount of breathing disturbance at night leading to sleep fragmentation, and the effect on sleepiness and quality of life and performance.

Many patients have difficulty at work and may face losing jobs, have difficulty with personal relationships and have higher risk for accidents. Quality of life measurements such as SF36 show reduced levels in energy and vitality dimensions which will respond to therapy<sup>4</sup>.

OSAS is present for life unless intervention occurs. Children suffering from OSAS will perform poorly at school and may develop behavioural problems if the condition is not recognised.

In adults OSAS is linked with hypertension, cardiovascular disease and cerebrovascular disease<sup>5,6</sup>.

OSAS increase the risk of involvement in a road traffic accident of 5 to 7 times over normal rates. Accidents are often serious due to lack of braking and ability to respond appropriately when sleepiness occurs. The accident rate is reduced to that of normal with therapy.

### *Treatment*

#### Nasal continuous positive airway pressure (CPAP)

CPAP devices deliver a fixed pressure of air to the upper airway during sleep. The device consists of a blower pump attached to a length of hose and mask. The patient places the mask over the nose or nose and mouth during sleep. The air pressure splints open the upper airway and no collapse occurs. The oxygen level is maintained throughout the sleep period and no sleep fragmentation occurs. Sleep quality is improved and patients often report a marked improvement after the first night of use<sup>7</sup>. There are many manufacturers producing a variety of devices that provide the air pressure. These are broadly similar. Some patients require machines with certain refinements such as the “smart” CPAP that can sense what pressure changes occur and can increase or decrease the delivery of pressure accordingly. However there is no evidence that any one CPAP device is superior to others.

### *Weight Loss*

All overweight patients will be advised to loose weight. This is difficult for people to achieve. There is evidence to suggest that some patients can benefit from obesity surgery.

### *Mandibular Devices*

These devices are worn in the mouth and advance the position of the mandible during sleep<sup>8</sup>. They are second line treatment for OSAS.

### *Efficacy of CPAP*

There are many randomised placebo control trials to support the use of CPAP. Endpoints in these trials include sleepiness, simulated driving ability, bloodpressure and quality of life<sup>9-11</sup>.

Health costs show that treating 500 OSAS patients with CPAP for 5 years will save approximately £5 million by reducing accidents and injury and using Department of Transport figures<sup>12</sup>.

### *NICE Technology Appraisal*

This is important as the provision of CPAP is a very variable across the UK. Whether a patient gets diagnosed and treated depends on where they live and British Sleep Society conducted a review and holds data on the sleep services and the provision of CPAP in the country.

NICE is the important guide to purchasers and an appraisal of CPAP will provide the information necessary to work on delivering a uniformly accessible service across United Kingdom.

1. Guilleminault C, Tilkian A, Dement WC. The sleep apnea syndromes. *Ann Rev Med* 1976;**27**:465-84.
2. Suratt PM, Findley LJ. Driving with sleep apnea. *N Engl J Med* 1999;**340**:11-3.
3. Stradling JR, Crosby JH. Predictors and prevalence of obstructive sleep apnoea and snoring in 1001 middle aged men. *Thorax* 1991;**46**:85-90.
4. Jenkinson C, Stradling J, Petersen S. Comparison of three measures of quality of life outcome in the evaluation of continuous positive airways pressure therapy for sleep apnoea. *J Sleep Res* 1997;**6**:199-204.
5. Nieto FJ, Young TB, Lind BK, Shahar E, Samet JM, Redline S *et al*. Association of sleep-disordered breathing, sleep apnea, and hypertension in a large community-based study. Sleep Heart Health Study. *JAMA* 2000;**283**:1829-36.
6. Pepperell JCT, Ramdassingh-Dow S, Crosthwaite N, Mullins R, Jenkinson C, Stradling JR *et al*. Ambulatory blood pressure following therapeutic and sub-therapeutic nasal continuous positive airway pressure for obstructive sleep apnoea: a randomised prospective parallel trial. *Lancet* 2002;**359**:204-10.
7. Jenkinson C, Davies RJ, Mullins R, Stradling JR. Long-term benefits in self-reported health status of nasal continuous positive airway pressure therapy for obstructive sleep apnoea. *QJM* 2001;**94**:95-9.
8. Ferguson KA, Cartwright R, Rogers R, Schmidt-Nowara W. Oral appliances for snoring and obstructive sleep apnea: a review. *Sleep* 2006;**29**:244-62.
9. Ballester E, Badia JR, Hernandez L, Carrasco E, de Pablo J, Fornas C *et al*. Evidence of the effectiveness of continuous positive airway pressure in the treatment of sleep apnea/hypopnea syndrome. *Am J Respir Crit Care Med*. 1999;**159**:495-501.
10. Hack M, Davies RJ, Mullins R, Choi SJ, Ramdassingh-Dow S, Jenkinson C *et al*. Randomised prospective parallel trial of therapeutic versus subtherapeutic nasal continuous positive airway pressure on simulated steering performance in patients with obstructive sleep apnoea. *Thorax* 2000;**55**:224-31.
11. Loreda JS, Ancoli-Israel S, Kim EJ, Lim WJ, Dimsdale JE. Effect of continuous positive airway pressure versus supplemental oxygen on sleep quality in obstructive sleep apnea: a placebo-CPAP-controlled study. *Sleep* 2006;**29**:564-71.
12. Douglas NJ, George CF. Treating sleep apnoea is cost effective. *Thorax* 2002;**57**:93.