

OHTAC Recommendation

Polysomnography in Patients with Obstructive Sleep Apnea

June 16, 2006

OHTAC Ontario
Health Technology
Advisory Committee



Polysomnography in Patients with Obstructive Sleep Apnea

The Ontario Health Technology Advisory Committee (OHTAC) met on June 16, 2006 and reviewed a health technology policy assessment of the use of polysomnography in the diagnosis and management of patients with Obstructive Sleep Apnea (OSA) presented by the Medical Advisory Secretariat (MAS).

Sleep disorders are common. Obstructive sleep apnea (OSA) is the predominant type. OSA is a repetitive complete obstruction (apnea) or partial obstruction (hypopnea) of the collapsible part of the upper airway during sleep. The syndrome is associated with excessive daytime sleepiness or chronic fatigue.

Polysomnography (PSG) in a sleep laboratory is the current standard for the diagnosis of OSA. Patients stay overnight in the sleep laboratory and are constantly monitored by a technician. Level 1 PSG includes electroencephalography, electrooculography, submental electromyography (EMG), electrocardiography, respiratory movement or respiratory effort, nasal or oral airflow, pulse oximetry and limb movement EMG. Level 2 PSG does not include EEG, EOG, and submental EMG. These data are collated to calculate the apnea-hypopnea index (AHI), which is the sum of apneas and hypopneas per hour of sleep.

National averages of sleep studies per 100,000 population show that in Canada, on average, there are about 370/100,000 people, 427/100,000 in the USA, 42.5/100,000 in the UK, 177/100,000 in Belgium, and 282/100,000 in Australia. In Ontario, the rate is 769/100,000 population. This makes Ontario the highest user of sleep studies in the world.

Currently, there are 97 licensed sleep laboratories in Ontario in independent health facilities and several in Ontario hospitals. The rate at which sleep studies were done in Ontario rose from 376/100,000 people in 2000 to 769/100,000 people in 2004.

As of April 1998, OHIP insured the following with regard to sleep disorder studies:

- patients with sleep disorders will be limited to 2 overnight sleep studies in any 12-month period;
- the diagnostic facility should verify eligibility for insured sleep studies with both the patient and the referring physician prior to rendering the service; and

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- medically necessary additional testing will require prior authorization from the Ministry of Health and Long-Term Care's District Medical Consultant.

The province covers approximately 75% of the total cost of the CPAP device through the Assistive Devices Program. The device usually needs replacement every 5 years. The standard treatment of OSA is lifelong therapy with continuous positive airway pressure (CPAP).

The cutoff point of the number of AHI which are significant (> 5, > 10, > 15) used to diagnose and categorize the severity of OSA varies, and therefore, appears arbitrary. These cutoff points have undetermined clinical importance.

There are new devices that measure sleep parameters at home. In the absence of a gold standard for the diagnosis of OSA it is problematic to determine the diagnostic accuracy of the home devices. Recently, a therapeutic trial of CPAP alone was used to diagnose OSA. Patients were habitual snorers with daytime sleepiness who did not have any other medical or psychiatric disorder. Using PSG as the reference standard, the sensitivity of CPAP alone was 80% and specificity was 97%. The authors concluded that OSA can be accurately diagnosed by a therapeutic trial of CPAP, rather than PSG.

A two week trial is offered by CPAP vendors. During this time, it may be possible to diagnose OSA and determine compliance.

In Ontario of 72,941 patients (with a mean age of 48 years) who underwent sleep studies during 2000-2004, the number of studies per patient ranged from two to four. In 60,822 (83%) patients, PSG was performed.

In 2004, at least one PSG (level 1) was done in 62,498 patients. Of these, 10,702 (17%) patients underwent CPAP titration study (which indicates that they were diagnosed with OSA), 4% had suspected narcolepsy and 1.2% patients had maintenance of sleep wakefulness tests (indicated to determine the ability to stay awake in select cases, for example, factory workers/truck drivers). The utility of PSG in 48,345 (77%) patients is unclear. This raises the question of whether or not PSG is being appropriately utilized in Ontario.

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An estimated 927,105 people aged 30-60 years have sleep disordered breathing. If all are tested there would be a ten fold increase in the rate of sleep tests. In 2004, the province spent \$47.4 million on sleep tests and \$25.6 million on CPAP devices for OSA patients.

Many of the patients who have OSA are obese, and many are morbidly obese. Treating morbidly obese patients with bariatric surgery could be ultimately cost saving since costs avoided are related to co-morbid conditions such as diabetes, hypertension, and hyperlipidemia. Many of the patients who have OSA would also no longer require follow up sleep testing and CPAP therapy.

The Medical Advisory Secretariat compared costs and effectiveness (quality adjusted life years [QALYs]) of three strategies:

1. current practice of referring all sleepy patients to sleep laboratory for PSG, and following up patients in whom OSA is diagnosed with a CPAP titration study, and life long CPAP therapy with yearly sleep tests and 5 yearly CPAP device replacement;
2. alternate strategy in which the current practice is linked with obesity control strategy – 8% of OSA patients who are also morbidly obese are offered bariatric surgery each year as per current capacity; and
3. a new strategy in which sleep tests are not offered but a CPAP trial is offered, and patients in whom OSA is diagnosed are treated with CPAP therapy and 90% of OSA patients who are also morbidly obese are offered bariatric surgery each year.

The results showed that when co-morbidity costs were included, the mean incremental cost of the second strategy compared to the first strategy was -\$3,168 (95% probability interval = -\$2,570, -\$3,761), and the mean incremental cost of the third strategy compared to the first strategy was -\$6,908 (-\$6,038, -\$7,765). Thus, both the second and third strategies were cost saving compared to the first strategy (current practice), and this conclusion did not change by exclusion of co-morbidity costs – although cost savings were greater when these costs were included. The mean incremental QALYs for the second and third strategies were higher compared to the first strategy.

Thus, by developing appropriate screening filters for sleep studies and linking sleep clinics with obesity clinics, the province may maximize the benefits (associated with improvement in quality of life and/or cure), and minimize harms (including dollars spent on medically unnecessary sleep studies) in sleepy patients.

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OHTAC Recommendations:

OHTAC recommended the following with regard to the use of polysomnography:

- A simple pragmatic study should be undertaken to explore the effectiveness and utility of PSG in sleepy patients given that new evidence suggests that OSA can be accurately diagnosed with a trial of CPAP, and given that it is not known whether PSG is being appropriately utilized in Ontario. The study should also develop a screen for appropriate utilization of PSG in sleepy patients.
- The province should reconsider insurance coverage of sleep studies in sleep laboratories based on the findings from the pragmatic study.
- OHTAC supports co-operation between sleep clinics and obesity clinics to optimize the benefits of weight reduction in OSA patients.
- OHTAC finds that this assessment of PSG in OSA patients supports its earlier recommendation that morbidly obese Ontarians be provided with increased access to bariatric surgery.