

IN BRIEF A Summary of the Optimal Use Project

Treating Obstructive Sleep Apnea

Key Messages

- Tailor the treatment of obstructive sleep apnea (OSA) based on a patient's disease severity and other patient factors.
- Treatment of mild OSA may not be needed. Lifestyle modifications for patients who are overweight or obese may be effective.
- Treat moderate to severe OSA with continuous positive airway pressure (CPAP). If CPAP is not acceptable, treat with oral appliances.
- Consider surgery for OSA only if other treatments have failed or are unacceptable.

Context

Obstructive sleep apnea (OSA) is a sleep disorder that affects as many as one in four adults in Canada. When people with OSA fall asleep, the muscles in their throats relax, causing their upper airways to collapse. As a result, their breathing stops and restarts throughout the night. Symptoms of OSA include snoring, unrefreshing sleep, excessive daytime sleepiness, lack of concentration, impaired memory, and lower quality of life. Anyone can develop OSA, but some factors may increase the risk, such as obesity, male gender, older age, alcohol and drug use, smoking, having narrowed airways, and family history. Untreated, OSA can lead to serious health complications such as fatigue, hypertension, cardiovascular events, and diabetes. Across Canada, OSA leads to a substantial economic and societal burden.

Technology

There are many available treatments for OSA:

- Continuous positive airway pressure (CPAP) forces air into the upper airway to prevent the soft tissues from collapsing — and is often considered the gold standard of OSA treatment.
- Other positive airway pressure (PAP) devices such as auto-titrating PAP (APAP) and bilevel PAP (BiPAP) are also available.
- Nasal expiratory PAP (EPAP) valves are disposable devices that use a patient's own breathing to create

positive pressure in the airways at the end of a breath to prevent airway collapse.

- Oral appliances (OAs) include mandibular advancement devices (MADs) that bring the jaw forward to maintain an open airway, and tongue-retaining devices (TRDs).
- Surgery, called maxillomandibular advancement (MMA), permanently pulls the lower jaw forward to create more space and prevent airway collapse.
- Another type of surgery called genial tubercle advancement (GTA) removes bone tissue from the chin and pulls the base of the tongue forward to create more airway space. It may be performed along with MMA.
- Other possible treatments include positional therapy, as well as lifestyle interventions such as diet and exercise to help patients with OSA who are obese or overweight to lose weight.

Issue

With so many treatment options available for OSA, deciding which intervention is best suited to each patient can be difficult. Public coverage of the costs of these treatments varies across Canada, leading to differences in access for Canadians. Providing a review of the evidence and expert recommendations on the treatment of OSA will help clinicians, policy-makers, and patients to best use available OSA treatment options in Canada.

Methods

To address the issue of OSA treatment in Canada, CADTH undertook an Optimal Use project to assess the clinical and cost-effectiveness, safety, and patient experiences of interventions for OSA in adults. Ethical issues, implementation considerations, and the potential environmental impact were also addressed. The Health Technology Expert Review Panel (HTERP) developed recommendations for treating OSA based on the evidence.

Results

For the clinical overview of systematic reviews (SRs), meta-analyses, and health technology assessments (HTAs), 33 SRs were included. For the supplementary review of primary studies for areas of gap, 41 primary studies were included. CPAP, EPAP, MADs, TRDs, MMA, GTA, weight loss programs, and positional

therapy were all effective at reducing excessive daytime sleepiness and OSA severity, compared with inactive controls or pre-treatment. For excessive daytime sleepiness as the outcome, effect sizes were similar across the interventions, except for people with severe cases of OSA who may benefit more from CPAP than from MADs. For OSA severity as the outcome, effect sizes varied across the interventions, with CPAP showing the largest effect, followed by EPAP, and then MADs or OAs. For people with severe cases of OSA who are eligible for surgery, MMA with or without GTA may be effective at improving both excessive daytime sleepiness and OSA severity.

Cost-effectiveness of treatment strategies for OSA was found to be dependent on a patient's baseline OSA severity (as measured by the Apnea-Hypopnea Index or AHI). At a willingness-to-pay threshold of \$50,000/quality-adjusted life-year (QALY), the order in which interventions were considered cost-effective by increasing disease severity were: no treatment (AHI < 15), MADs (15 ≤ AHI ≤ 25), MMA with or without GTA (25 < AHI < 30), PAP therapy (30 ≤ AHI ≤ 32), and MMA with or without GTA (AHI > 32).

The patient experiences review revealed that a range of characteristics and factors influence whether people seek and initiate OSA treatment, including their prior expectations and beliefs about treatment, the social support they have available, and their lifestyles. The review also revealed that interventions for OSA require people to adapt their daily routines and relationships, and that some people are able to integrate the interventions into their lives and experience benefits, while others are unable to do so.

The review of ethical issues revealed six key values: respect individual autonomy, maximize benefits and minimize harms for patients, maximize benefits and minimize harms for others affected by OSA, maximize benefits and minimize harms for

populations, distribute benefits and burdens of health care resources fairly, and steward scarce resources.

One of the biggest implementation issues found was the difficulties in accessing sleep specialists and sleep labs to obtain a diagnosis, if appropriate, and begin to seek appropriate treatment. Barriers for CPAP included cost and patient discomfort, while supports included patient education and ongoing support. OA barriers included lack of physician awareness, dental health requirements, and the need for regular re-evaluations.

Little evidence on the environmental impact of OSA treatment was identified. One study was found which focused on the manufacturer adoption of green packaging, as well as energy-efficient and recyclable devices.

Read more about the CADTH OSA project:



www.cadth.ca/OSA

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March 2017