

**Title** Interventions for the Treatment of Obstructive Sleep Apnea in Adults: A Health Technology Assessment  
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[https://www.cadth.ca/sites/default/files/pdf/OP0525\\_OSA\\_Treatment\\_HTA\\_Report.pdf](https://www.cadth.ca/sites/default/files/pdf/OP0525_OSA_Treatment_HTA_Report.pdf)  
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### Aim

This health technology assessment reviewed the evidence on the clinical effectiveness, cost-effectiveness, patient perspectives and experiences, ethical issues, implementation issues, and the environmental impact of positive airway pressure (PAP) devices, expiratory PAP valves, oral appliances, surgery, and lifestyle modifications for the treatment of obstructive sleep apnea (OSA) in adults.

### Conclusions and results

Clinical data indicated that positive airway pressure devices, expiratory positive airway pressure (EPAP) valves, oral appliances (OAs), surgery, and lifestyle modifications for the treatment of OSA in adults were found to significantly improve excessive daytime sleepiness (EDS) and OSA severity across studies, with similar effect sizes among interventions for EDS as compared to inactive controls or pre-treatment. Continuous positive airway pressure (CPAP) showed the largest effect for OSA severity. The treatment of patients with moderate-to-severe OSA appeared to be a cost-effective use of resources under a willingness-to-pay threshold of \$50,000 per quality-adjusted life-year (QALY). Nevertheless, patient adherence to treatment was considered key in achieving treatment benefits for any non-surgical therapy and the economic findings were sensitive to patient adherence and rate of treatment discontinuation. A range of patient factors lead people to seek and initiate treatment, or not, including the support of family members and prior expectations and beliefs. All OSA interventions were described as uncomfortable and all require adaptation to daily routines and relationships. Some people are able to adapt and experience benefits, but others are unable to do so. An ethics analysis illustrated that OSA treatment interventions have demonstrated that they offer benefits to patients and reduce overall costs, and they appear to live up to values of conferring benefits at a population level and stewarding scarce resources. Further, optimizing interventions for OSA to minimize harmful outcomes on both an individual and a population level is of great benefit, given the variability in adherence associated with patient behaviours and attitudes. The review of implementation issues highlighted the difficulties in accessing sleep specialists and laboratories as critical to initiating the treatment of OSA, as well as the potential benefits of multidisciplinary sleep clinics. A single review was found on environmental considerations for CPAP, such as energy-efficient and recyclable products, and green shipping.

### Recommendations

1. For patients with mild OSA who are overweight or obese, the Health Technology Expert Review Panel (HTERP) recommends lifestyle interventions. For patients with mild OSA who are not overweight or obese, HTERP does not recommend active treatment.

2. For patients with moderate or severe OSA, HTERP recommends CPAP. For patients with moderate or severe OSA for whom CPAP is unacceptable, oral appliances are recommended.
3. HTERP does not recommend surgical maxillomandibular advancement in patients with OSA, unless other interventions have failed or are unacceptable to the patient.

### Methods

An overview of reviews was conducted, supplemented by a review of primary studies for areas where no reviews were identified, to address questions on the comparative clinical effectiveness and safety of OSA interventions in adults. EDS was the primary outcome; and OSA severity, blood pressure, cardiovascular events, quality of life, mortality, success or cure rate, blood pressure, and type 2 diabetes, were among several secondary outcomes assessed. A Markov cohort model was constructed to evaluate the cost-effectiveness over a patient's lifetime from a Canadian health care payer perspective, with incremental costs per QALY gained in 2016 Canadian dollars as the primary outcome. A systematic review and thematic synthesis of the literature on patient perspectives and experiences was conducted, using a maximum variation sampling approach to identify articles for inclusion. Results were synthesized through a staged coding process, and developing descriptive and analytic themes. Narrative reviews were conducted on implementation issues, and the environmental impact of treatment interventions for OSA in adults, and an ethical analysis was conducted to identify ethical considerations around the use and provision of OSA interventions.

### Further research/reviews required

Studies with direct, head-to-head comparisons or network meta-analyses on the clinical effectiveness and safety of OSA interventions, and their impact in subgroups of patients who have hypertension or cardiovascular disease, is warranted. Research is also merited on patient adherence to treatment, especially its change over time and its relationship with the effectiveness of various treatment interventions. Specific populations are under-represented in the literature, including Indigenous populations and populations with certain work occupations (e.g., military and law enforcers). Studies on the diagnosis of OSA in women are necessary to assess whether OSA is underdiagnosed, less common, or misdiagnosed among this population. There is also a need to evaluate shared decision-making and decision aids in OSA.

**Written by:** CADTH, Canada