CDSBC

STANDARDS & GUIDELINES

Obstructive Sleep Apnea

The Role of Dentists in the Treatment of Snoring and Obstructive Sleep Apnea with Oral Appliances

TABLE OF CONTENTS

Standards and guidelines inform practitioners and the public of CDSBC's expectations for registrants. This document primarily contains guidelines that are highly recommended but – while being evidence of a standard – are not, strictly speaking, mandatory. Guidelines contain permissive language such as "should" and "may." This document also contains a standard, which is, by definition, mandatory and must be applied. Standards are clearly identified by mandatory language such as "must" and "required."

1. Acknowledgement

This document is adapted from a paper by Drs. Fernanda R. Almeida, Alan A. Lowe and Luc Gauthier for the College of Dental Surgeons of British Columbia (CDSBC). It is based on evidence-based dentistry as outlined in previous guidelines from CDSBC, the Canadian dental sleep medicine position papers on the management of obstructive sleep apnea (OSA) and review papers on this subject[1].

2. Purpose of the Document

The purpose of this guideline is to:

- describe the interdisciplinary teamwork between dentists and physicians that is required for oral appliance (OA) therapy for adult patients being treated for snoring and/or OSA; and
- clarify the role and responsibilities of each professional in the management of OA therapy in patients who are being treated for snoring and/or OSA.

3. Introduction

Obstructive sleep apnea is a medical syndrome that is characterized by recurrent episodes of partial or complete upper airway obstruction during sleep. Obstructive sleep apnea is common and is associated with reduced quality of life, decreased cardiovascular health and increased healthcare utilization, motor vehicle accidents and mortality[2,3]. There are a variety of treatment options currently available for OSA including lifestyle modifications, continuous positive airway pressure (CPAP), corrective upper airway surgery and OAs such as mandibular advancement splints (MAS).

The diagnosis of OSA is confirmed if the number of obstructive events per hour of sleep (apneas, hypopneas + respiratory event related arousals/hour of sleep; called respiratory disturbance index – RDI) on polysomnography is greater than 15 events/hour or greater than 5/hour in a patient who reports any of the following: unintentional sleep episodes during wakefulness; daytime sleepiness; unrefreshing sleep; fatigue; insomnia; waking up breath holding, gasping, or choking; or the bed partner describing loud snoring, breathing interruptions, or both during the patient's sleep. Obstructive sleep apnea severity is defined as mild for RDI ≥ 5 and < 15, moderate for RDI ≥ 15 and ≤ 30, and severe for RDI > 30/hr[4].

According to the guidelines of the Canadian Thoracic Society and the American Academy of Sleep Medicine (AASM)[5], OAs in the adult population are recommended as a first-line therapy option for patients with primary snoring (without apnea) and for patients suffering from mild to moderate OSA who prefer an OA to CPAP therapy[5,6,7].

Oral appliances are also an alternative therapy for patients with severe OSA who cannot tolerate CPAP, are inappropriate candidates for CPAP, or who have undergone failed CPAP treatment attempts. A more detailed description can be found in the AASM article[5].

Oral appliances are also called dental orthotics, tongue retaining devices, mandibular advancement appliances (MAA), MAS or mandibular advancement devices (MAD). Oral appliances improve OSA because of an increase in the patency of the upper airway during sleep, the provision of a stable and consistent anterior position of the mandible, advancement

of the tongue, and possibly by an increase in upper airway volume and/or shape and a change in genioglossus muscle activity[8].

An effective MAS is custom fabricated using digital or physical impressions and models of an individual patient's oral structures. As such, it is not a primarily prefabricated item that is trimmed, bent, relined, or otherwise modified. It is made of biocompatible materials and engages both the maxillary and mandibular arches. The OA has a mechanism that allows the mandible to be advanced in increments of 1 mm or less with a protrusive adjustment range of at least 5 mm. In addition, reversal of the advancement must be possible. The protrusive setting must be verifiable. The appliance is suitable for placement and removal by the patient or caregiver. It maintains a stable retentive relationship to the teeth, implants or edentulous ridge and retains the prescribed setting during use[9]. Thermoplastic/prefabricated/boil and bite devices cannot be used as a screening tool to find good candidates for mandibular advancement therapy at this point[10].

STANDARD: The dentist's role in the treatment of OSA is adjunctive, supplementary and/or collaborative to that provided by the physician. A dentist may provide OA therapy only after receiving a written request or prescription from the attending physician, preferably a physician with advanced training in sleep medicine. Because of the increased rates of morbidity and mortality associated with OSA, a physician (family physician or sleep specialist) must assess the potential for other medical conditions, including OSA, before a dentist provides any treatment for primary snoring[1,8].

4. Role of the Physician

In cases where OA treatment is required, the physician's collaborative role with the dentists is described below. This description is not intended to fully describe the role of physicians in the field of medicine, sleep or OSA.

In agreement with BC Medical Association protocols, a medical assessment (often with an overnight polysomnogram) is interpreted by an accredited physician with advanced training in sleep medicine, referred to here as a sleep physician*. The use of unattended portable monitor devices should be performed in conjunction with a comprehensive sleep evaluation and supervised by a physician trained in sleep medicine[11]. A physician prescription is required to order a portable monitor for testing for OSA; therefore, OSA diagnosis should always be determined by a physician who also has seen the patient clinically.

After a physician decides that OA therapy should be the treatment option for the patient, a written referral or prescription and diagnostic report should be sent to a dentist who has training in this field of treatment.

*A sleep physician is a medical doctor with a specialization in respirology, neurology, psychiatry, internal medicine, or ear, nose and throat, and with training in sleep medicine who holds a license to practise medicine in Canada. Family physicians may belong in this group if they hold board certification in sleep medicine or the equivalent. All the above-mentioned physicians are responsible for their own acts. None of the above persons should receive financial benefit from a sleep-related company (e.g., CPAP, OA services, third-party payer) that may influence the decision process in patient diagnosis or therapeutic recommendations and management. It is the role of the provincial authorities to make sure that the guidelines are respected.

5. Role of the Dentist

The dentist's role in the management of snoring and OSA is to:

- screen for potential OSA, utilizing appropriate tools, by recognizing symptoms of OSA (snoring with other symptoms, e.g., sleepiness, choking, witnessed apneas);
- refer patients with either primary snoring or snoring with potential OSA to their family physician for a review of the overall medical history and to rule out the presence of OSA (the physician may refer the patient to a physician who is proficient in sleep medicine11); and
- provide therapy with OAs and behavioural therapy after receiving a written request or prescription from a physician. Dentists should never start treatment for snoring or OSA without a physician's assessment of the patient. Because OSA is a disease with increased mortality risk, OAs should be fitted by a qualified dentist (see below for qualifications).

5.1 Qualifications

Dentists who offer therapy for OSA should be able to demonstrate competency in this field. Knowledge and previous use of various devices are highly recommended. Due to the rapidly developing changes in this area of dentistry, dentists should continuously update their expertise through continuing education on sleep disorders and sleep apnea.

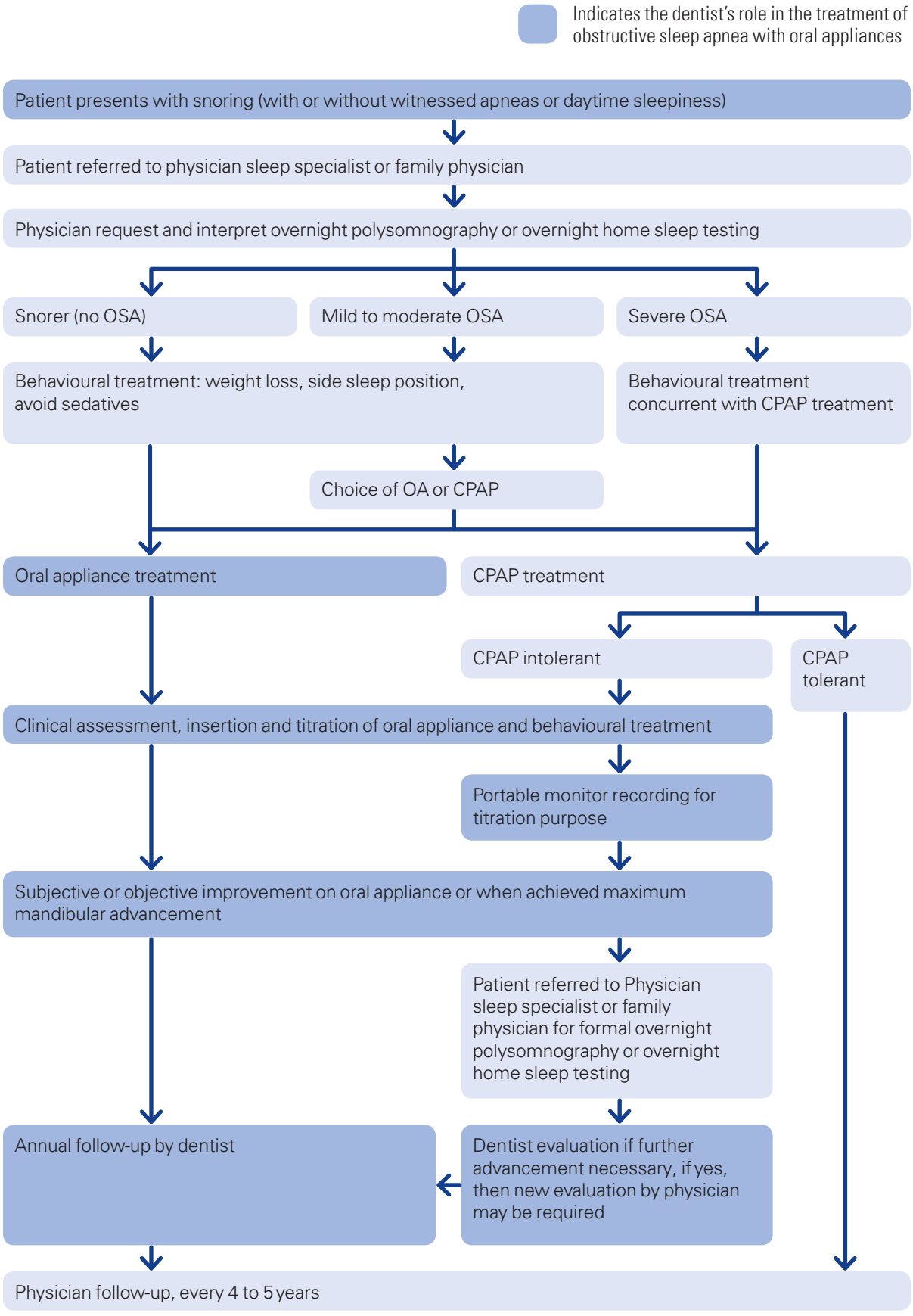
6. Treatment Sequence

A flow chart showing the overall sequence of treatment is shown in Figure 1. A more detailed treatment sequence is described below. After a patient has received a physician's evaluation and request for an OA, the dentist will be responsible for the patient's treatment as follows.

6.1 Dental Exam Requirements

1. A medical-dental history which includes: age, weight, and height, plus neck and belt circumference as indicated, the presence of tonsils, tongue size, palate width and depth, malocclusion classification (including overjet and overbite measurements), the presence of tooth erosion or tooth wear, medications, and presence of other disease (similar to a general detailed medical history)
2. Assessments of sleepiness (e.g., the Epworth Sleepiness Scale)
3. Soft tissue/ intraoral assessment
4. Periodontal evaluation
5. Temporomandibular joint examination
6. Assess concomitant bruxism (tooth grinding and/or clenching), orofacial pain, and/or headaches
7. Occlusal examination and recording of existing condition
8. Examination of teeth and restorations
9. Initial dental radiographs as indicated. Cephalometric and panoramic radiographs as a pre-treatment record. Cone-beam computed tomography and/or other computed tomography at this time are not indicated
10. Diagnostic dental models

Figure 1: Sequence of treatment for obstructive sleep apnea



6.2 Treatment Plan for Obstructive Sleep Apnea

1. Provide patients with explanations and information on sleep behavioural therapy including sleep hygiene, sleeping position, weight control and alcohol intake along with the type of device considered and all alternatives (e.g., CPAP therapy, surgery, or positional therapy).
2. Propose various OAs to the patient, according to the patient's oral health status and craniofacial morphology (MAS, tongue retaining device, or equivalent). Appliance design, fabrication, fitting and placement should be completed as indicated in the section on OA therapy on page 7. Dentists should provide positional therapy information on treatment options for patients with positional OSA.

6.3 Patient Consent and Side Effects of Oral Appliances

The dentist should explain the proposed treatment, with long term follow-ups, to the patient and obtain the patient's consent, preferably in writing, before fitting the appliance. The consent form should clearly indicate the potential and probable side effects of using the OA and appliance longevity.

Side effects caused by OAs are usually described as mild and transient, most frequently reported as dry mouth, excessive salivation, mouth or teeth discomfort, muscle tenderness and/or jaw stiffness.

Significant and persistent temporomandibular joint problems are rare. Long-term side effects have been described with all appliances studied mainly related to occlusal changes:

- Changes observed in craniofacial structures are mainly related to significant tooth movement. As an example, about 80% of patients who use an OA every night over a period of seven years will experience occlusal changes.
- These changes are most commonly characterized as an average 2.5 mm decrease in overjet and overbite which may be favourable or unfavourable for the occlusion.
- Although these occlusal changes may be undesirable in certain patients, the effective treatment of a life-threatening disease such as OSA may supersede the maintenance of a baseline occlusion.
- If the patient decides that occlusal changes are undesirable, the treatment should be discontinued only if the patient accepts another form of therapy from their attending physician or the patient understands the risks of the discontinuation of therapy and their physician is informed.
- The correction of the occlusion with restorations, crowns and/or orthodontic treatment should be considered only if the patient has discontinued treatment and is able to use another OSA treatment, as these changes will continue, although at a slower pace, as long as the patient wears the device.

7. Oral Appliance Therapy

The steps involved in the provision of an OA for a patient with OSA are as follows:

1. **Oral appliance insertion, adjustments, titration and evaluation during the first six months of regular use.** The dentist should monitor and collect information on the resolution of the patient's sleep disorder symptoms to assess efficacy and to determine the optimal titration of the OA.

   If the dentist can obtain objective data, for example with a portable monitor, this information should be used for purposes of titration only, and not for follow-up assessments or diagnosis. The dentist working with portable monitors for titration should be able to accurately interpret the results, which means the dentist will monitor mainly changes of respiratory sleep parameters with treatment. The dentist should not use this equipment as diagnosis or as formal assessment; it is the role of the physician to use portable monitors for check-ups or reassessments of the patients.

2. **Referral of patient for follow-up evaluation** by the referring physician and polysomnography or sleep studies that are required to verify treatment efficacy and benefits. Oral appliances may worsen OSA in some patients and there are known placebo effects for this type of therapy. Follow-up polysomnography is not indicated for patients with primary snoring, unless symptoms worsen or do not resolve.

3. **Maintenance of regular written communication with the patient's physician** and other healthcare professionals concerning the treatment plan, progress, and follow-up is recommended.

   The referring physician should be involved in the ongoing evaluation of the treatment of OSA. The dentist should obtain a follow-up report on the treatment efficacy from the sleep physician. In the case of unsatisfactory results, the dentist may extend the OA titration or review the treatment plan with the patient.

4. **Further titration, modification, redesign or remake of the OA, as required.** Patients should be monitored monthly for the first six months by the dentist and at least annually thereafter, as long as the appliance is worn.

5. **Follow-up and reassessment (after six months) to assess treatment adherence and efficacy.** The dentist may advance/titrate the appliance further if symptoms reoccur. If maximum mandibular advancement is reached and symptoms are still present, the patient should be referred to the referring physician who may then refer to a sleep specialist for further evaluation. The dentist should assess the integrity of the OA; it may need to be replaced, depending on usage and hygiene. Oral appliances generally last approximately 2-3 years. As for long-term efficacy, patients should be referred to their referring physician every five years for continuing assessment, as OSA is known to worsen with aging and weight gain[8]. Refer to section 6.3 on page 6 (Patient Consent and Side Effects of Oral Applicances).

8. Glossary

Cephalometric radiograph: A radiograph of the head, including the mandible, in full lateral view, used to make measurements; also called a cephalogram.

Concomitant bruxism: Unconscious tooth grinding and/or clenching that occurs especially in situations of stress or during sleep, and may naturally accompany other sleep disorders.

Cone-beam computed tomography: A medical imaging technique consisting of X-ray computed tomography where the X-rays are divergent, forming a cone.

Continuous positive airway pressure (CPAP): A treatment that uses air pressure to keep the airways open, typically is used by people who have breathing problems such as sleep apnea. CPAP treatment involves a CPAP machine, which has three main parts:

- a mask or other device that fits over the nose or nose and mouth, and straps to keep the mask in place;
- a tube that connects the mask to the machine's motor; and
- a motor that blows air into the tube.

Craniofacial morphology: The study of the shape, structure, color or pattern of the region of the body that includes the front part of the head from the chin to the top of the forehead, and the part of the skull enclosing the brain.

Epworth Sleepiness Scale: A scale intended to measure daytime sleepiness by use of a short questionnaire. This can be helpful in diagnosing sleep disorders. The total Epworth Sleepiness Scale score can range between 0 and 24. The higher the score, the higher the person's level of daytime sleepiness. A score higher than 10 indicates increased sleepiness.

Malocclusion: Literally meaning "bad bite." Refers to the relationship of the fit of the teeth on both arches. It may include a dental classification, with additional reference to crossbites and/or openbites.

Mandibular advancement splints (MAS): A device worn in the mouth that is used to treat obstructive sleep apnea and snoring. The splint treats snoring and sleep apnea by moving the lower jaw forward, which may tighten the upper airway soft tissue and/or change the shape of the upper airway and/or increase the patency of the upper airway to prevent obstruction of the airway during sleep. The changes in the upper airway will change flow dynamics during inspiration, preventing vibration the upper airway soft tissues, which is the most common cause of loud snoring.

Obstructive sleep apnea (OSA): A condition in which the flow of air pauses or decreases during breathing while a person is asleep because the airway has become narrowed, blocked or floppy. A pause in breathing is called an apnea episode. A decrease in airflow during breathing is called a hypopnea episode.

Occlusal examination: An assessment of the static and dynamic relationship of the teeth in both arches.

Oral appliance (OA): A small, custom fabricated device that fits in the mouth to create more space and prevent the collapse of the tongue and soft tissue in the back of the throat. Also called dental orthotics, tongue retaining devices or mandibular advancement splints, this device is used to treat obstructive sleep apnea and snoring.

Panoramic radiograph: A type of extraoral body-section radiograph on which the entire maxilla or mandible can be depicted on a single film.

Polysomnography: A multi-parametric test or comprehensive recording of the biophysiological changes that occur during sleep, used in the study of sleep and as a diagnostic tool in sleep medicine; also known as a sleep study.

Positional therapy: This therapy promotes side sleeping instead of sleeping on the back. It may include the use of a special shirts, body pillow and positional alarm to make it uncomfortable to sleep on the back. Positional therapy has its limits, but it has been tried with success in some patients.

Sleep behavioural therapy: Includes sleep hygiene, sleeping position, weight control and avoidance of sedatives, including alcohol.

Sleep hygiene: The practices and habits that affect the quality of sleep such as use of stimulants, alcohol, exercise, napping, time spent in bed, and quality of the sleep environment. Good sleep hygiene practices include avoiding naps in the late afternoon and evening; avoiding heavy meals, caffeine and tobacco close to bedtime; exercising earlier in the day, establishing a relaxing bedtime routine; and limiting distractions in the sleep environment.

Sleep physician: A medical doctor with a specialization in respirology, neurology, psychiatry or internal medicine; or an ear, nose and throat specialist with training in sleep medicine. Family physicians may belong in this group if they hold board certification in sleep medicine or the equivalent.

9. References

1. Gauthier, L., et al., *Position paper by Canadian dental sleep medicine professionals on the role of different health care professionals in managing OSA and snoring with oral appliances*. Can Respir J, 2012.19(5): p. 307-309.
2. Marin, J.M., et al., *Long-term cardiovascular outcomes in men with obstructive sleep apnoea-hypopnoea with or without treatment with continuous positive airway pressure: an observational study.* Lancet, 2005. 365(9464): p. 1046-53.
3. Buchner, N.J., et al., *Continuous positive airway pressure treatment of mild to moderate obstructive sleep apnea reduces cardiovascular risk*. Am J Respir Crit Care Med, 2007. 176(12): p. 1274-80.
4. American Academy of Sleep Medicine. International classification of sleep disorders, 2nd Edition: Diagnostic and coding manual. *Westchester, IL: American Academy of Sleep Medicine*;. 2005.
5. Kushida, C.A., et al., *Practice parameters for the treatment of snoring and Obstructive Sleep Apnea with oral appliances: an update for 2005*. Sleep, 2006. 29(2): p. 240-3.
6. Ferguson, K.A., et al., *Oral appliances for snoring and obstructive sleep apnea: a review*. Sleep, 2006. 29(2): p. 244-62.
7. Fleetham, J., et al., *[Practice Guidelines of the Canadian Thoracic Society on the diagnosis and treatment of sleep respiratory problems of adults]*. Can Respir J, 2007. 14(1): p. 31-6.
8. Almeida, F.R. and A.A. Lowe, *Principles of oral appliance therapy for the management of snoring and sleep disordered breathing*. Oral Maxillofac Surg Clin North Am, 2009. 21(4): p. 413-20.
9. Scherr S.C., Dort L., Almeida F.R., et al., *Definition of an Effective Oral Appliance*. Journal of Dental Sleep Medicine. June 2014.
10. Vanderveken O.M., Devolder A., Marklund M., et al. *Comparison of a custom-made and a thermoplastic oral appliance for the treatment of mild sleep apnea*. Am J Respir Crit Care Med. Jul 15 2008;178(2):197-202.
11. Blackman, A., et al., *Canadian Sleep Society/Canadian Thoracic Society position paper on the use of portable monitoring for the diagnosis of obstructive sleep apnea/hypopnea in adults*. Can Respir J, 2010. 17(5): p. 229-32.

Board Approved

- September 2013

Date Published

- June 2014

Originating Committee

- Quality Assurance Committee

CDSBC | College of Dental Surgeons of British Columbia

500 – 1765 West 8th Avenue
Vancouver, BC Canada V6J 5C6
www.cdsbc.org

Phone 604 736-3621
Toll Free 1 800 663-9169
Fax 604 734-9448