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Dentists Against Drowsy Driving (DADD) and Sleep Apnea

By Dr. Dan Hagi



Dentists against drowsy driving (DAAD) was established by the American Academy of Dental Sleep Medicine (AADSM) to increase awareness among health-care practitioners and the public about the alarming risks and economic impact of the largely undiagnosed and untreated sleep-related breathing disorders (SBD). According to the Institute of Medicine's report, 50-70 million Americans suffer from chronic sleep disorders. The estimated prevalence of Obstructive Sleep Apnea (OSA) in Canadian population is 2% to 5%. Daytime hypersomnolence alone costs \$150 billion annually in lost productivity and mishaps, and another \$48 billion in medical costs related to motor vehicle accidents that involve drowsy drivers. 20% of all serious car crashes are associated with daytime hypersomnolence, independent of alcohol.

So what are these Sleep-Related Breathing Disorders? Sleep-related breathing disorders (SBD) include the spectrum of snoring, upper airway resistance syndrome and OSA. SBD are caused by repetitive collapse or blockage of the upper airway while asleep. This can result in reduced blood oxygen levels to the brain, heart and other vital organs. Snoring is the resultant "warning bell" of partial or impending airway collapse, whereas obstructive sleep apnea (OSA) results from a complete airway obstruction lasting greater than ten seconds. When you stop breathing during sleep due to sleep apnea, the balance of oxygen and carbon dioxide in the blood is upset. This imbalance stimulates the brain to restart the breathing process. The brain signals you to wake up, so that the muscles of the tongue and throat can increase the size of the airway. These waking episodes are necessary to

restart breathing (and to save your life), and you may not remember them, but they do disrupt your sleep and cause daytime exhaustion. In addition to daytime sleepiness, OSA may have other daytime symptoms of cognitive impairment that include memory loss, morning headaches, irritability, depression, decreased libido and impaired concentration. Left untreated, OSA can cause hypertension, strokes, cardiovascular dysrhythmias, myocardial infarction and sudden death while asleep.

The primary causes and risk factors of OSA are:

- being overweight or obese
- having large tonsils or adenoids, deviated septum or enlarged tongue
- nasal congestion or blockage (from cold, sinusitis, allergies, smoking, etc.)
- throat muscles and tongue that relax more than normal during sleep (possibly due to alcohol or sedatives or age).

Sleep-related breathing disorders including OSA are diagnosed by overnight polysomnography, a sleep study usually performed in an accredited sleep laboratory and interpreted by a sleep physician. Unfortunately, the vast majority of OSA is undiagnosed and untreated. Dentists are becoming more involved with sleep physicians as part of a harmonious integrated multidisciplinary team approach for the treatment of OSA. They are challenged to share the responsibility in responding to the alarming healthcare risks and economic impact of the largely untreated OSA in the general population. Dentists have the knowledge and the expertise in upper airway anatomy and physiology, which is essential to understanding and treating OSA. Most dentists are capable of performing Oral Appliance Therapy (OAT), which is a recognized 1st line treatment for mild-moderate OSA. Finally, dentists understand occlusion and are best prepared

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to manage potential side effects of OAT.

Minor OSA is responsive to self-help remedies, or "behavioral treatments", these include:

- Lose weight. Overweight individuals who lose even 10% of their weight can reduce sleep apnea and improve sleep quality.
- Stop using alcohol, tobacco, and sedatives, or anything that relaxes the muscles of the throat and encourages snoring.
- Sleep on your side. Special pillows or remedies that encourage side-sleeping might help people who only experience sleep apnea when they sleep on their back.
- Elevate the head of your bed 4-6 inches. This can alleviate snoring and make breathing easier.
- Use a nasal dilator, breathe right strips or saline nasal spray to help open nasal passages.
- Maintain regular sleep hours.

More severe OSA may require Continuous Positive Airway Pressure (CPAP). CPAP is the most widely recommended treatment for moderate to severe OSA. CPAP entails wearing a mask-like device during sleep, which provides pressurized air to prevent the airway from collapsing. Most CPAP units are the size of a tissue box and many now come with a built in humidifier for comfort. While CPAP works very well in preventing apnea symptoms, many people find the apparatus uncomfortable and difficult to use. Luckily, recent advancements to CPAP technology have made these once cumbersome devices much lighter, quieter and much more comfortable.

Mild to moderate OSA can also be treated using Oral Appliance Therapy (OAT). Dentists have pioneered the scientific research and clinical development of OAT. OAT involves the selection, fabrication, fitting, adjustments, and long term follow-up care (and management of potential complications such as malocclusion and temporomandibular joint (TMJ) dysfunction) of custom-designed oral devices. These devices are worn only during sleep, and used for repositioning of the mandible and tongue base anteriorly to enlarge and stabilize the airway. In comparison to the traditional gold standard treat-

ment CPAP, OAT is better tolerated in terms of required nightly use. Like CPAP pressures, the amount of mandibular and tongue base advancement can be titrated to patient comfort limits and/or therapeutic efficacy. If subtherapeutic, OAT may also be used concomitantly with CPAP, thereby allowing lower therapeutic pressures that may be more tolerable. Recently the Somnomed MAS appliance has been gaining widespread popularity and is one of the most comfortable appliances used.

Upper airway surgery is generally indicated when these conservative therapies are non-applicable, unsuccessful, or intolerable. Surgery may be an effective treatment for SBD, but only if performed competently and on correctly identified specific anatomic sites that contribute to upper airway obstruction, which varies between different patients. Surgery can effectively increase the size of the patient's airway. The surgeon may remove tonsils, adenoids, or excess tissue at the back of the throat or inside the nose. Or, the surgeon may reconstruct the jaw to enlarge the upper airway.

The general population should be aware that Sleep-related breathing disorders such as snoring and OSA are very common medical disorders. They are more common in males and worsen with advancing age and weight gain. The hallmark sign of OSA, a potentially life-threatening disorder, is snoring while asleep and the most common symptom while awake is excessive sleepiness. Daytime sleepiness is a major health risk not only to the individual that may have OSA, but also to others such as while driving motor vehicles on the highways. Anyone who exhibits snoring with associated "gasping for air" while asleep as well as daytime sleepiness (eg., "falling asleep at the wheel" while driving) probably has OSA and should be referred to a sleep physician for diagnosis and treatment. You can also alert your dentist of these possible OSA signs and symptoms for referral to a sleep physician for diagnostic testing, and then back to your dentist for OAT in selected cases.

Dr. Dan Hagi DDS, FAGD, FICOI
www.thornhillsmilecentre.com

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