

## Managing Sleep Disordered Breathing in Dental Practice

### Educational Objectives

Following this unit of instruction, the practitioner should be able to:

1. Understand the group of conditions known as Sleep Disordered Breathing (SDB), including how they are diagnosed and treated.
2. Screen dental patients for SDB.
3. Discuss how Obstructive Sleep Apnea (OSA) is currently diagnosed and treated by physicians, and how dentists may be involved in treating OSA.
4. Understand the American Academy of Dental Sleep Medicine (AADSM) Treatment Protocols for dentists treating SDB.
5. Discuss how to introduce the screening and treatment of SDB into their dental office.

### Introduction

Sleep Disordered Breathing (SDB) is defined as repeated patterns of interrupted breathing during sleep. It is a chronic condition that can aggravate other disorders such as hypertension, cardiovascular disease, diabetes and obesity. It is a widespread problem; affecting approximately 18 million people in the United States.<sup>1</sup> Snoring and Sleep Apnea are two types of SDB. Sleep apnea is characterized by a cessation of breathing for 10 or more seconds during sleep. There are three different types: Obstructive Sleep Apnea (OSA), caused by a closure of the air passage despite efforts to breathe, Central Sleep Apnea, a lack of effort to breathe or Mixed Sleep Apnea which is a combination of both Obstructive and Central Sleep Apnea. OSA is by far the most common type.

OSA is caused by a partial or complete collapse of the airway. This lack of airflow causes oxygen levels to drop,

disrupting sleep and putting stress on the cardiovascular, endocrine and pulmonary systems.<sup>2</sup> OSA is very common in the U.S. population, potentially deadly, easily diagnosed by a physician and can be managed by a dentist. In most cases, the diagnosis of OSA doesn't occur until 10 years after the onset of the disease. Up to 90% of individuals with OSA have never been diagnosed.<sup>3</sup> People with untreated OSA are six times more likely to have a car accident due to excessive daytime sleepiness.<sup>4</sup> Given its prevalence and effect on health, quality of life and safety, OSA is a significant public health issue.

### Obstructive Sleep Apnea

OSA represents one end of a continuum of breathing dysfunction that is related to increased airflow resistance in the airway (Figure 1). Airflow resistance at first simply causes the throat tissue to vibrate (snoring). Although not considered a medical problem by itself, snoring is a

Figure 1

#### Continuum of Sleep Disordered Breathing



### SECOND EDITION

#### Author Acknowledgements

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Dr. McLornan has no relevant financial relationships to disclose.

The following commentary highlights fundamental and commonly accepted practices on the subject matter. The information is intended as a general overview and is for educational purposes only. This information does not constitute legal advice, which can only be provided by an attorney.

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Originally published September 2012.  
Updated and revised October 2016.  
Expiration date: October 2019. The content of this Guide is subject to change as new scientific information becomes available.

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primary warning sign of OSA and can be a serious social problem. As airflow resistance increases, the patient must work harder to breathe (high upper airway resistance [HUAR]). HUAR causes brief arousals (respiratory effort-related arousals) and daytime fatigue. This condition is usually associated with snoring, but does not result in significant oxygen desaturation. When airflow resistance leads to partial or complete airway collapse, and results in decreased blood oxygen levels, the condition is termed OSA.

OSA is characterized by: Repeated collapse of the muscles surrounding the airway, partially or completely blocking airflow; oxygen desaturation; continued respiratory effort (the patient continues to try and breathe) despite obstruction; brief unconscious arousals from sleep due to oxygen deprivation, and; disrupted sleep and sleep loss resulting from multiple arousals during the night. OSA is basically a physiological failure of the muscles supporting the airway, leading to airway collapse. This disorder is not truly a disorder of sleep but rather a disorder that occurs during sleep, leading to disrupted and non-restorative sleep.

The causes of OSA may be neuromuscular or anatomical (see Table 1) and patients with OSA may present with the several symptoms in addition to snoring (see Table 2).

**Comorbidities**

The physiological changes during sleep and oxygen deprivation caused by OSA have been associated with pathology in other organ systems, including cardiovascular, endocrine and pulmonary. Individuals with untreated OSA can develop or also suffer from:<sup>2</sup>

- Hypertension
- Atrial fibrillation
- Coronary artery disease
- Congestive heart failure
- Stroke
- Type II diabetes
- Obesity
- Depression, anxiety

**Diagnosing OSA**

The patient must have an overnight sleep test to be diagnosed for OSA. Depending on the state, a dentist may or may not order this sleep test (it's important to know your state's dental practice act and to check with your liability insurance before ordering a sleep test). Dentists may not interpret the results of a sleep test – or diagnose OSA. In most states, a board-certified sleep specialist must interpret the results of the sleep test, however, any physician may make the diagnosis of OSA based on the results of the sleep test.

**Sleep Testing Options**

Polysomnogram (PSG) - A PSG requires the patient to stay overnight in a sleep lab. It records multiple variables during sleep, including brain waves, electrical activity of muscles, eye movement, breathing rate, blood pressure, blood oxygen saturation and heart rhythm.

Home Sleep Test (HST) - According to Medicare, and many private insurers, HSTs are acceptable

alternatives for the diagnosis of OSA. Level III HSTs are the most commonly used because they monitor all the essential variables at a cost effective price. The variables measured by a Level III HST include: breathing rate, blood pressure, blood oxygen saturation and heart rhythm. The HST is still read by a board certified sleep physician.

**Measuring OSA**

A patient must have a decrease in oxygen saturation of 2-4% due to partial or complete blockages of the airway multiple times per night to meet the criteria for OSA. Physicians often report the results as Apnea-Hypopnea Index (AHI) or Respiratory Disturbance Index (RDI). Although they are often used interchangeably, they differ slightly:

Apnea-Hypopnea Index (AHI) - AHI is the average number of apneas and hypopneas (complete and partial collapses of the airway, respectively) per hour of sleep. It is calculated by adding the total number of apneas and hypopneas recorded and dividing this figure by the number of hours the

Table 1 - Causes of Obstructive Sleep Apnea

<p><b>Neuromuscular Dysfunction (primary cause)</b></p> <ul style="list-style-type: none"> <li>• Collapse of the pharyngeal dilator muscles</li> <li>• Failure of the mandibular muscles to stabilize jaw structure in closed position</li> <li>• Rotation of the mandible open and back (functional retro-gnathia)</li> <li>• Collapse of tongue into airway</li> </ul>
<p><b>Anatomic Issues (secondary cause)</b></p> <ul style="list-style-type: none"> <li>• Fatty deposition in the airway</li> <li>• Excessive soft tissue in the neck region</li> <li>• Micro-gnathic / Retro-gnathic mandible</li> <li>• Enlarged uvula, tonsils or tongue</li> <li>• Nasal obstruction due to deviated septum</li> <li>• Nasal valve collapse</li> </ul>

Table 2 - Symptoms of Obstructive Sleep Apnea

Nighttime Symptoms	Daytime Symptoms
<ul style="list-style-type: none"> <li>• Restless, non-restorative sleep</li> <li>• Choking and/or gasping</li> <li>• Acid reflux</li> <li>• Heavy sweating</li> <li>• Nocturia</li> </ul>	<ul style="list-style-type: none"> <li>• Excessive daytime sleepiness, fatigue</li> <li>• Falling asleep while driving</li> <li>• Morning headaches or sore throat</li> <li>• Personality and/or mood changes</li> <li>• Cognitive impairment, inability to concentrate</li> <li>• Sexual dysfunction</li> </ul>

patient spent asleep. This measure represents the severity of sleep apnea, including sleep disruptions and desaturations. The AHI classifies OSA into three categories (Figure 2).

Respiratory Disturbance Index (RDI) - The RDI is also a measure of the severity of sleep apnea, including sleep disruptions and desaturations. Unlike the AHI, the RDI also counts the number of arousals caused by respiratory effort. It is the average number of Sleep Disordered Breathing events that cause an arousal from sleep per hour of sleep. It is calculated by adding the number of apneas, hypopneas and respiratory effort-related arousals and dividing this figure by the number of hours the patient spent asleep.

### Diagnosis of OSA

The diagnosis of OSA may be made when one of the following criteria is met:<sup>5</sup>

1. AHI or RDI > 5 per hour of sleep, evidence of respiratory effort, and symptoms (extreme sleepiness, witnessed apneas, etc.), or
2. AHI or RDI > 15 per hour of sleep, evidence of respiratory effort, and no other symptoms.

## Managing OSA in a General Dental Practice

### Why should a dentist care about OSA?

As many as 25% of men, and 10% of women, between the ages of 30 and 60, suffer from SDB. Dentists typically see patients on an annual or semi-annual basis, allowing them to play an important role in:

- The early identification of patients with OSA;
- Treating patients' with mandibular advancement devices, and;
- Managing patients with OSA over time.

### Identifying a Patient with SDB

Due to the prevalence of SDB, individuals with undiagnosed SDB visit many dental offices for oral health care in the United States each year. Identifying these individuals as candidates for therapy may require only minor modifications in office protocol. Activities that may assist in identifying patients with SDB include:

Figure 2



#### Create SDB Awareness:

- Add a sign and place brochures about snoring and OSA in your waiting room
- Send a descriptive letter to existing patients
- Highlight SDB therapy in your practice newsletter
- Send a letter to your referral network
- Send out a press release
- Add a section on SDB treatment to your website, including patient testimonials
- Place an advertisement in a local newspaper or magazine

#### Add Questions to the Medical History Form:

- Has anyone ever told you that you snore?
- Has anyone ever told you that you stop breathing at night?
- Does your bed partner snore or stop breathing at night?
- On a scale of 1 to 10, how sleepy are you during the day?
- Have you ever had a sleep study?
- Has a physician ever prescribed CPAP therapy for you?

#### Carefully look for clues in a patient's Medical History. Red flags may include:

- Hypertension or drug-resistant hypertension
- Overweight individuals or those with recent weight gain
- Cardiovascular disease
- Diabetes
- Gastro-esophageal reflux disease (GERD)
- CPAP usage

#### Perform "Airway-Focused" Oral Exams. Red flags in an oral exam include:

- Narrow or V-shaped upper arch
- Cross bite in molar area
- Soft tissue that visually obstructs airway
- Large or scalloped tongue
- Bony tori

### Screening for OSA

OSA diagnosis must be by a physician, however dentists can screen their patients and assist in early identification of OSA by: taking careful medical histories at the initial examination and recalls; administering simple patient questionnaires; interviewing bed partners; observing oral indicators, and; assessing the patient's risk for OSA using appropriate tools (Table 3).

### Referring a Patient to a Physician

A dentist should refer patients to their primary care physician or a sleep physician for further evaluation, testing and diagnosis whenever there is a suspicion of possible OSA, or demonstrates symptoms associated with untreated OSA (fatigue, high blood pressure).

### Treating OSA

There are many options for treating snoring and OSA, including both nonsurgical and surgical approaches. It is important for the patient to understand that there is no permanent cure for OSA. They must realize that therapy will typically continue for the rest of their lives. According to the American Academy of Sleep Medicine (AASM), optimal options for treatment of snoring and sleep apnea are:<sup>5</sup>

Conservative Treatments - The following measures have been shown to improve OSA (they are also often recommended for occasional snorers):<sup>9</sup>

- Improving sleep hygiene; (Sleep hygiene is a variety of different practices that are necessary to have normal, quality nighttime sleep and full daytime alertness. The most important sleep hygiene measure is to maintain a regular sleep and wake pattern seven days a week.)
- Abstaining from alcohol and sedatives;
- Avoiding sleeping on one's back, and;
- Losing weight.

Oral Appliance Therapy - There are two types of oral appliances for the treatment of OSA: Mandibular Advancement Devices (MADs) and Tongue-Retaining Devices. Custom made MADs (adjustable by the patient) are indicated for snoring, mild to moderate OSA and severe OSA (if the patient cannot tolerate Continuous Positive Airway Pressure therapy).<sup>5</sup>

Continuous Positive Airway Pressure (CPAP) - A CPAP machine supplies positive air pressure that provides a pneumatic splint for the airway. The forced air opens blockages and prevents collapse of the upper airway during sleep. Air is delivered through a hose to a mask that fits over the patient's nose, mouth, or both. Patients may choose from a variety of mask sizes and styles to achieve the most comfortable fit. The complete CPAP system consists of a programmable pressure generator, tubing, mask and headgear. CPAP has been shown to be an effective treatment for OSA, however long term patient compliance rates are low.<sup>10</sup>

Surgery - In some cases, surgery may be an appropriate treatment option.<sup>11</sup> Maxillomandibular advancement surgery demonstrates the best outcomes, however tonsillectomy, adenoidectomy and tracheotomy have been used.<sup>12</sup> In some cases, nasal surgery to correct blocked nasal passages, or uvulopalatopharyngoplasty (UPPP) to enlarge the air space by excising redundant soft tissue from the palate and uvula, may be appropriate.

### Treatment Recommendations

The American Academy of Sleep Medicine (AASM) recommends oral appliances as a first line of therapy for patients with mild to moderate sleep apnea. They also recommend oral appliances for people who have been diagnosed with severe sleep apnea and have tried, and not been successful, with CPAP devices.

### Oral Appliance Therapy in Dental Practice

Mandibular Advancement Device (MAD) Therapy may be part of a general dental practice. MADs mechanically open the patient's airway by repositioning the jaw and the attached muscles, including the tongue. This movement (jaw protrusion) is the same as the "chin-lift" technique used in cardiopulmonary resuscitation. Advancement of the mandible increases volume of the oral airway.

Table 3 - Appropriate Risk Assessment Tools for Use in Dental Practice

<p><b>Adjusted Neck Circumference Measurement</b></p> <p>The adjusted neck circumference (ANC) formula can help determine the likelihood that a patient suffers from OSA.<sup>6</sup> To calculate the ANC score, measure the patient's neck in centimeters, then, add the appropriate number if the patient meets the following criteria:</p> <ul style="list-style-type: none"> <li>• 4 – if patient has hypertension;</li> <li>• 3 – if patient snores;</li> <li>• 3 – if the patient reports choking or gasping at night or has had witnessed apneas.</li> </ul> <p>Patients with scores of 43 and above are at increased risk of having OSA.</p>
<p><b>Epworth Sleepiness Scale Questionnaire</b></p> <p>The Epworth Sleepiness Scale (ESS) (Figure 3) is commonly used to evaluate a patient's level of sleepiness.<sup>7</sup> This questionnaire is often administered both before and after treatment to document any improvements. The questionnaire consists of 8 scenarios for the patient to consider. The patient then rates how likely he or she would be to doze off or fall asleep in each situation. Scores over 10 indicate that the patient may be excessively sleepy and should be further evaluated.</p>
<p><b>Overnight Pulse Oximetry Test</b></p> <p>Studies have shown that an overnight pulse oximetry test is useful in ruling out that a patient is at risk for OSA. [Note: These tests are not used to diagnose OSA] The most critical measurement from an overnight pulse oximetry test is the proportion of time the patient's blood oxygen level (SpO<sub>2</sub>) is below 90%. If the patient's SpO<sub>2</sub> is below 90% less than 1% of the night, clinically significant OSA may be ruled out.<sup>8</sup></p>

Figure 3

### The Epworth Sleepiness Scale (To Assess Risk of Obstructive Sleep Apnea)

Use the following scale to choose the most appropriate number for each situation:

- 0 = would never doze
- 1 = Slight chance of dozing
- 2 = Moderate chance of dozing
- 3 = High chance of dozing

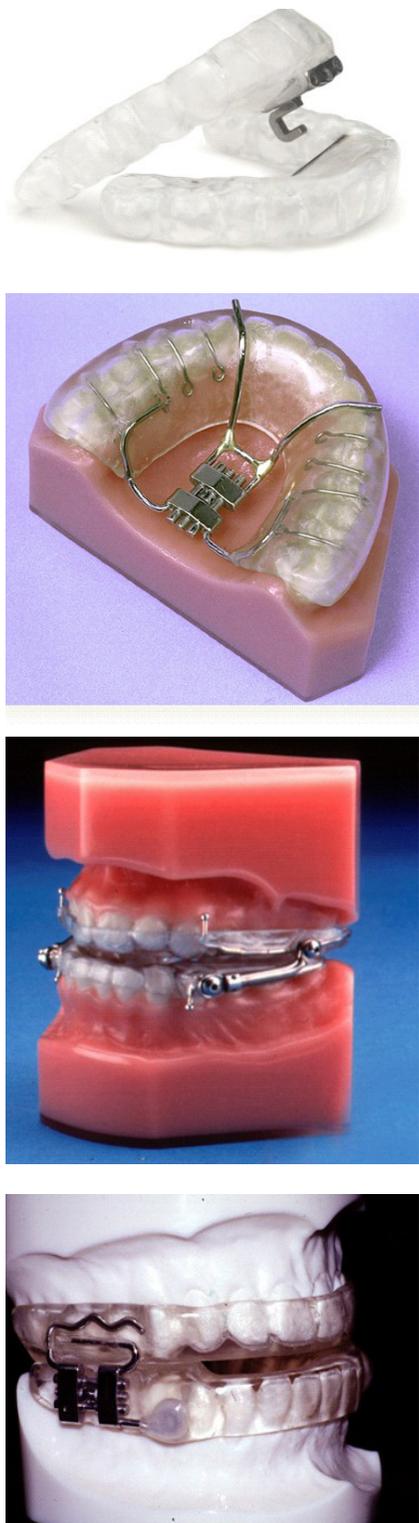
Situation	Chance of Dozing
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g., a theater or meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in the traffic	
<b>TOTAL</b>	

**SCORE:** 0 - 10 Normal Range  
 10 - 12 Borderline  
 12 - 24 Abnormal

## Appliance Selection

MADs vary greatly in design, function and performance (Figure 4). A dentist should familiarize

Figure 4



themselves with the different appliances so they can make appropriate choices. It's important to choose appliances that will get predictable and reliable results over time. The following things should be considered when making appliance selections:

- How many millimeters of protrusion does the appliance have?
- Where is the titration mechanism located?
- Can the patient adjust the appliance at home?
- How difficult is the appliance for the patient to adjust?
- What is the breakage rate of the appliance?
- How retentive is the device on the teeth?
- With the device in place how much space is there for the tongue to rest in the palate?
- Does the device meet Medicare criteria for reimbursement?

## Factors that Determine MAD Treatment Success

Patient Acceptance – Claustrophobia, dental sensitivity, a gag reflex, or intolerance to an intraoral appliance can be barriers to patient acceptance and compliance with therapy.

Appliance Design – Acceptable appliances should have the following characteristics:

- The appliance should be able to gradually advance the lower jaw (titration).
- There should be minimal encroachment on the oral tissues such as the lips, the cheeks and especially the tongue.
- All clinical crowns in both arches should be completely covered to reduce tooth movement.
- The appliance should be retentive to the teeth even in a partially edentulous mouth. (Most appliances require a minimum of 8 teeth per arch for retention)
- The upper and lower trays should be connected to stabilize the jaw in the proper protruded position and prevent the jaw from opening or sliding backwards.
- Posterior support can be added, if needed, to increase patient comfort.

## Initiating Therapy

A dentist may decide to treat the patient for snoring if the results of an overnight pulse oximetry test indicate that there are no desaturation events, the patient does not have other signs or symptoms of untreated OSA (daytime sleepiness, hypertension) and does not have any comorbidities of OSA. The dentist may decide to treat a patient for OSA if he/she has received a referral from a physician.

Prior to placing any oral appliance, the dentist must make sure that there is no oral pathology present in the upper or lower arch or the temporomandibular joints. Pathology such as periodontal diseases, temporomandibular dysfunction and tooth mobility should be resolved prior to initiating treatment. It is highly recommended that: the patient be thoroughly educated about the health risks linked to OSA; a signed informed consent document be obtained from the patient, and; the patient be instructed to alert the office if he/ she experiences any problems while wearing the appliance or new symptoms present such as joint pain or changes in occlusion.

Patients using a MAD for snoring or OSA should be monitored initially every 6 months and if stable then annually thereafter. If the patient's condition changes or new symptoms develop, the patient should be referred back to the prescribing physician for further evaluation.

## Medicare Criteria for Reimbursement

The federal government instituted a new policy for the Medicare reimbursement of oral appliance therapy for OSA in 2011. The appliance must have the following features to be covered:

- Custom trays that fit on each arch
- A mechanism that advances the lower jaw in < 1 mm increments
- The ability to advance the jaw to maximum protrusion
- A "hinge or joint" between the upper and lower arch trays.
- Ability to be adjusted by the patient

A physician must refer the patient to a dentist for oral appliance therapy with a letter of medical necessity in order for the dentist to be eligible for medical insurance or Medicare reimbursement.

## Determining Efficacy of Oral Appliance Therapy

If the patient snores but does not have OSA, treatment success is determined by the patient and/or bed partner's subjective report that the snoring has been eliminated or reduced to an acceptable level. If the patient has been diagnosed with OSA, both subjective and objective follow-up is necessary to determine the effectiveness of the device. It is of utmost importance to conduct a follow-up sleep study (typically a home sleep study or an overnight pulse oximetry test) to determine whether oxygen saturation levels have returned to normal. If they have not, other treatment options should be considered as an alternative, or in addition, to oral appliance therapy. The AASM considers a mild OSA patient successfully treated if the RDI is reduced to below 5. A moderate/severe patient is considered successfully treated if the RDI is reduced to below 10.<sup>5</sup>

## Side Effects of Oral Appliance Therapy

Tooth movement and/or occlusal changes may occur in some cases when oral appliances are

used. It is important to inform patients of this risk prior to treatment. If the patient complains that their bite is "not normal" after removing the appliance in the morning, they should be advised to wear a small repositioning splint (typically provided by the laboratory with the appliance) until the jaw muscles relax and allow the jaw to return to its "normal" position. The patient should be instructed in morning exercises to realign the jaw to its "normal" position and advised to chew gum for 20 minutes or until the jaw feels "normal" again.

If the patient complains of a sore jaw immediately after delivery, assure him/her that soreness within the first few days of wearing the appliance is normal. Ask them to refrain from advancing (titrating) the device until the muscles are completely comfortable in the "starting" position.

If the patient experiences persistent pain in the TMJ region or the ear during the first week of therapy, he/she should be instructed to stop using the device and return for evaluation. The patient's midline without the appliance in place should be evaluated and the bite registration assessed to

make sure that the midline is the same on the working model as it is in the patient's mouth. If there is a difference, have the appliance remade. The TMJ should be reevaluated to ensure that there is no pathology. TMJ issues must be resolved prior to reinitiating therapy.

## Conclusion

Sleep Disordered Breathing is one of the world's most prevalent, and under-diagnosed, medical disorders. Dentists have an increasingly important role in recognizing and treating the condition. Because of the associated morbidity and mortality, dentists must work with physicians as part of a therapy team. Successfully treating a patient's sleep disordered breathing is one of the most profound effects a dentist can have on both the quality and quantity of that patient's life have on both the quality and quantity of that patient's life.

## References

1. National Commission on Sleep Disorders Research. A report of the National Commission on Sleep Disorders Research: Wake up America – A national sleep alert. Vol. 2. Washington: National Commission on Sleep Disorders; 1995:10.
2. Nieto F, Young T, Lind B, et al. Association of sleep disordered breathing, sleep apnea and hypertension in a large community based study: Sleep Heart Health Study. JAMA 2000; 283:1829-36.
3. Young T, Palta M et al., The occurrence of Sleep Disordered Breathing among middle aged adults. N Engl J Med 1993; 328:1230-5.
4. George CF, Smiley A. Sleep apnea and automobile crashes. Sleep 1999;22:790-5.
5. Kushida CA et al., Practice Parameters for the Treatment of Snoring and Obstructive Sleep Apnea with Oral Appliances. An update for 2005. Sleep 28:499-521.
6. Flemons WW, Whitelaw WA, Brant R, Remmers JE. Likelihood ratios for a sleep apnea clinical prediction rule. AM J Respir Crit Care Med 1994; 150:1279-85.
7. Johns MW. A new method for measuring daytime sleepiness: the Epworth sleepiness scale. Sleep 1991; 14:540-5.
8. Gyulay S, Olson LG, Hensley MJ, King MT, Allen KM, Saunders NA. A comparison of clinical assessment and home oximetry in the diagnosis of obstructive sleep apnea. Am Rev Respir Dis 1993; 147: 50-3.
9. Smith PL, et al., Weight loss in mildly to moderately obese patients with obstructive sleep apnea. Ann Intern Med 1985;103: 850-5.
10. Wolkove N et al., Long term compliance with CPAP in patients with OSA. Can Resp. J. October 2008;15(7):365-369
11. Prinsell JR, Maxillomandibular advancement (MMA) in a site specific treatment approach for obstructive sleep apnea: a surgical algorithm. Sleep Breath 2000; 4(4): 147-54.
12. Sher AE, Schechtman KB, Piccirillo JF. The efficacy of surgical modifications of the upper airway in adults with obstructive sleep apnea syndrome. Sleep 1996;19(2);156-77.

## POST-TEST

Internet Users: This page is intended to assist you in fast and accurate testing when completing the “Online Exam.” We suggest reviewing the questions and then circling your answers on this page prior to completing the online exam.

(1.0 CE Credit Contact Hour) Please circle the correct answer. 70% equals passing grade.

- 1. Patients with a diagnosis of snoring following an overnight sleep study will have an Apnea/ Hypopnea Index / Respiratory Disturbance Index (AHI/RDI) of between:**
  - a. 10 to 15
  - b. 15 to 30
  - c. Greater than 30
  - d. None of the above
- 2. According to the American Academy of Dental Sleep Medicine Practice Parameters, an overnight sleep study to diagnose OSA can be interpreted by:**
  - a. Any physician
  - b. Only the patient’s primary care physician
  - c. Only a board certified sleep physician
  - d. the patient’s primary care physician or a board certified sleep physician
- 3. The most common form of Home Sleep Test (HST) used is a:**
  - a. Level I
  - b. Level II
  - c. Level III
  - d. Level IV
- 4. Approximately how many adults in the USA are thought to suffer from OSA?**
  - a. 3 million
  - b. 7 million
  - c. 18 million
  - d. 49 million
- 5. Which of the following non-invasive therapies can benefit patients with sleep apnea:**
  - a. Weight loss
  - b. Sleeping only on your back
  - c. An alcoholic drink before bed
  - d. Insomnia medications
- 6. Which of the following are surgical treatment options for OSA?**
  - a. Tracheotomy
  - b. Uvulopalatopharyngoplasty (UPPP)
  - c. Maxillomandibular advancement
  - d. All of the above
- 7. A physician must refer the patient to a dentist for oral appliance therapy with a letter of medical necessity in order for the dentist to be eligible for medical insurance or Medicare reimbursement.**
  - a. True
  - b. False
- 8. According to American Academy of Sleep Medicine estimates the % of adults with OSA who remain undiagnosed is:**
  - a. 10 to 20 %
  - b. 30 to 40%
  - c. 50 to 60%
  - d. 80 to 90%
- 9. Which of the following statements about Continuous Positive Airway Pressure (CPAP) is false?**
  - a. It provides a steady stream of pressurized air to patients through a mask they wear during sleep.
  - b. Long term patient compliance rates are high.
  - c. Patients can chose from numerous mask sizes and styles to achieve fit.
  - d. It is the recommended first line treatment for severe OSA patients.
- 10. Oral appliances are recommended by the American Academy of Sleep Medicine as a first line therapy for all patients diagnosed with severe OSA.**
  - a. True
  - b. False

