

Sleep HealthCenters® Newsletter

David P. White, MD, Editor September 2004

Dear Colleague,

In this issue of the Sleep HealthCenters® Newsletter, we discuss the use of oral appliances as an alternative therapy for patients with obstructive sleep apnea. Dr. Lockerman's article and related case study outline the use of oral appliances, addressing their mechanism of action, success rates and complications. Oral appliances are one of several tools available for the treatment of obstructive sleep apnea and can be customized, depending on the severity of the patient's disorder as well as patient preference.

In addition, we introduce the opening of our newest location in South Weymouth.

As always, we welcome your comments. Please feel free to contact us if we can be of any assistance.

Sincerely,

David P. White, MD
Corporate Medical Director
Sleep HealthCenters®, LLC




Sleep HealthCenters®
Better Sleep. Better Health.

1-877-SLEEPHC
1-877-753-3742

Oral Appliances in the Treatment of Obstructive Sleep Apnea

Larry Z. Lockerman, DDS

Dr. Lockerman is a practicing dentist on the staff of Sleep HealthCenters®. He is Credentialed by the Certification Board of the Academy of Dental Sleep Medicine and is a Diplomate of the American Board of Orofacial Pain. He is an Instructor of Surgery at the University of Massachusetts Medical School. He has 20 years of experience in teaching and treating patients with OSA. His practice solely deals with the non-surgical management of patients with obstructive sleep apnea with oral appliances and the management of chronic TMJ, face, head and neck pain.

Obstructive Sleep Apnea (OSA) is a common disorder that causes daytime sleepiness and increases the risk of developing hypertension and possibly other cardiovascular diseases such as stroke and heart failure. In OSA, the upper airway collapses repeatedly during sleep due to the interaction between the size of the airway and the changes in muscle tone accompanying sleep. OSA patients have smaller airways than those without OSA. With the onset of sleep the muscles of the airway, including the tongue (genioglossus), relax and can occlude the airway. The lack of air exchange during occlusion causes the oxygen level to drop. This stimulates attempts to breathe, which trigger arousal from sleep. The arousal returns tone to the genioglossus and other airway muscles and they resume their normal position. This cycle of short interrupted sleep prevents the person from attaining restful sleep. People with OSA are constantly tired and usually snore loudly.

How can Obstructive Sleep Apnea be managed?

Management and treatment for OSA falls into two categories: medical or surgical therapy. Medical management includes continuous positive airway pressure (CPAP) and oral appliance management, as well as behavioral modification such as weight loss. Surgical treatment includes a variety of surgeries on the soft tissues of the throat and maxillofacial reconstruction surgery. The first line therapy for moderate to severe OSA is CPAP. Patients with mild to moderate OSA do well with CPAP or an oral appliance. Surgery is usually reserved for patients who do not tolerate CPAP or an oral appliance or in rare cases of life-threatening OSA. An oral appliance is also an effective treatment for people who snore but don't have OSA.


How Does an Oral Appliance Work?

There are two types of oral appliances: mandibular advancement devices and tongue retaining devices. The mandibular advancement devices are the most commonly used dental appliances and are similar to an orthodontic retainer except that they are not used to move teeth. They work by changing the way the lower jaw meets the upper jaw during sleep. The appliance holds the lower jaw in a forward position creating more space at the back of the tongue and throat for air flow. The appliance anchors onto the upper jaw and advances the lower jaw. The lower part of the device is moved forward over several weeks to allow the jaw muscles to adapt to the new position. The appliance has an adjustable hinge or connector apparatus allowing for some side-to-side jaw movement. MRI and cephalometric x-ray studies have shown that mandibular advancement oral appliances increase the diameter of the pharyngeal airway (Sleep 2003; 26:440-45, Sleep 2001; 24:554-60). Tongue retaining devices use a suction bulb at the opening of the mouth to hold the tongue forward during sleep, preventing collapse of the posterior airspace.

What does an oral appliance look like?

Dental appliances are small, easy to wear and weigh only a couple of ounces. Their size makes them easy to travel with. After a few weeks most people are completely comfortable with the appliance.

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- ▶ Oral Appliances: A Case Study
- ▶ CEO Corner: Sleep HealthCenters® Opens Weymouth Facility
- ▶ Research Activities

Locations:

- ▶ South Weymouth, MA
- ▶ Newton, MA - affiliated with Brigham and Women's Hospital
- ▶ Bedford, MA - affiliated with McLean Hospital
- ▶ Malden, MA - affiliated with Hallmark Health
- ▶ Boston, MA - affiliated with Beth Israel Deaconess Medical Center
- ▶ Jamaica Plain, MA - affiliated with Faulkner Hospital

For more information, please contact our scheduling office at:
1-877-SLEEPHC (1-877-753-3742) or visit our website at www.sleephealth.com

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Are oral appliances effective in treating OSA?

A large review of oral appliance therapy found an overall success rate in eliminating OSA of 51%, with higher rates in mild to moderate cases (Sleep 1995;18:501-10). A four year follow-up study of mild to moderate OSA patients showed significantly higher success and normalization rates with oral appliances compared to the most common surgical procedure for OSA, the uvulopalatopharyngoplasty (UPPP) (Chest 2002;121:739-46). Compared to oral appliances, CPAP was more effective in eliminating OSA and subjective sleepiness, but the oral appliances were better tolerated (The Cochrane Database of Systematic Reviews, Nov, 2003). It is important to provide close follow-up after starting therapy, including a sleep study while wearing the appliance, because some patients do not respond to mandibular advancement.

Who is a good candidate for management with an Oral Appliance?

Appliances are most effective in mild to moderate OSA. Patients with this severity of OSA who either cannot tolerate CPAP or desire an alternative form of treatment should be considered for an oral appliance. Satisfaction with oral appliance therapy is greater than that with CPAP and studies have shown that patients are more likely to agree to use the oral appliance than CPAP if both are effective (Thorax 1997;52:362-8).

What are the risks of appliance management?

More than 25 different types of appliances are available for OSA management. Dentists must consider the efficacy and safety of the various appliances since they will be used for many years. Improper appliance selection can contribute to the development of problems. Changes in bite as well as muscle and temporomandibular joint (TMJ) pain have been documented with long-term use of mandibular advancement appliances for the treatment of OSA (Sleep 2001;24:531-7). TMJ problems, as well as occlusal changes, can result from even small amounts of mandibular advancement. Only 70% mandibular advancement may be sufficient and further protrusion can elongate the airway anteroposteriorly and collapse it laterally (JADA, 2001;132:339-47) in some cases. The success of an oral appliance can also be related to sleep posture, since sleeping on one's back can reduce the efficacy of an appliance (Sleep 2001;24:538-44) in some patients.

Who should I see to get an Oral Appliance?

A dentist experienced in the use of oral appliances should perform a complete dental exam to look for current or potential dental problems and insure proper appliance fit and type. The American Academy of Sleep Medicine recommends that the treating dentist must be capable of treating TMJ Dysfunction. Dentists who specialize in the use of oral appliances undergo additional training then must pass the Certification Board of the Academy of Dental Sleep Medicine. Patients at Sleep HealthCenters® are first evaluated by a sleep medicine specialist to make the diagnosis of OSA and decide on the type of treatment. Those electing treatment with an oral appliance undergo a thorough dental evaluation to detect TMJ or other preexisting problems. After being fitted for a custom-made

oral appliance, they are closely followed for response to therapy and detection of any problems. Once advancement is complete, they undergo a follow-up sleep study to document the effectiveness of therapy. Almost all medical plans cover oral appliance management for OSA.

Oral appliances have been used for over 20 years to treat OSA and there is extensive scientific evidence that details their safety and efficacy. Oral appliances are most effective in patients with mild to moderate OSA but may even be helpful in some patients with severe OSA. A follow-up sleep study should be performed to document efficacy. The devices are well tolerated with better acceptance than CPAP. Treating dentists should have knowledge in sleep disorders as well as expertise in the management of TMJ disorders.

CEO Corner

Paul S. Valentine
President and Chief Executive Officer



We are pleased to announce that Sleep HealthCenters® is opening its sixth sleep disorders center in South Weymouth, Massachusetts. The new facility is located in the Stetson Building at 541 Main Street, South Weymouth, Suite 318. We believe that this new facility will make our services more accessible to your patients. With four facilities located in proximity to Route 128, from the South Shore to the North Shore, and two facilities located in Boston, your patients should have little trouble visiting one of our centers.

The Sleep HealthCenter® at Weymouth will offer six quiet bedrooms with full-size beds and full private bathrooms. Each study will be completed using state-of-the-art diagnostic equipment. In addition, patients will be able to visit our medical clinic, as well as our CPAP clinic, if applicable, in the same location. The clinics and sleep lab opened on Wednesday, September 29. Dr. Roger Smith, board certified sleep specialist, is the facility medical director, and Pam Gaffney, CRT, will provide CPAP counseling services. As is true with all of our facilities, we can coordinate the provision of comprehensive sleep services, including oral appliances as discussed elsewhere in this newsletter.

Please contact us if you are interested in a tour of the facility or an introduction to the services we will be offering there. If you have a patient in the South Shore area that you would like us to see, you may contact our scheduling office at 1-877-SLEEPHC (1-877-753-3742). We look forward to servicing you and your patients from this new location.



ORAL APPLIANCES: A CASE STUDY

JB is a 50 year old gentleman who was previously diagnosed with obstructive sleep apnea in 1996 after presenting with complaints of loud snoring and daytime sleepiness. He received an oral appliance for treatment after being unable to tolerate nasal CPAP because of feelings of claustrophobia. Initially he had a good response to the device with resolution of sleepiness and snoring. However, over the past few years he had begun to feel tired during the day again and he was concerned that his oral appliance had become less effective. On examination he had a normal range of motion of the mandible and no TMJ problems. He was using a mono-bloc oral appliance (a one piece non-adjustable acrylic appliance) during sleep, which was in good condition.

A polysomnographic sleep study was done at Sleep HealthCenters® and

showed that he had 27 apnea/hypopnea events per hour without the oral appliance and 18/hour with the device. Wearing the old oral appliance provided some improvement but did not eliminate the OSA. The patient was still unable to tolerate CPAP, found his device easy to use and preferred to continue treatment with an oral appliance.

Impressions were made and he received a new adjustable oral appliance that allowed for mandibular movement while it is worn. After a few adjustment visits, a repeat polysomnogram was done with the new appliance and his Apnea/Hypopnea Index was down to 3/hour, well within the normal range. He felt rested in the morning and described the new appliance as being much more comfortable. After a short time with the new appliance his symptoms resolved.

Discussion: This patient had moderate OSA that responded to treatment with an oral appliance after an initial unsuccessful trial with CPAP. He originally received an oral appliance that was not adjustable. Over time, changes in the patient's muscle tone required repositioning of the mandible. Use of an adjustable appliance reestablished airway patency during sleep, maintained patient comfort and allowed for further adjustment if needed. Designing the most versatile, comfortable oral appliance that can be modified to enhance efficacy and limit face pain and TMJ discomfort is the key to successful management. Evaluation at Sleep HealthCenters®, with its comprehensive array of sleep medicine services, allowed the patient to get the most appropriate care and ensure the success of treatment.

Research Activities

Sleep HealthCenters® and their related research affiliations are actively recruiting patients for the following studies:

Apnea Positive Pressure Long-Term Efficacy Study (APPLES)
A NIH-funded study examining the long-term effects on quality of life, neurocognitive function, sleepiness and mood of using Continuous Positive Airway Pressure (CPAP) to treat sleep apnea. The Sleep HealthCenter® affiliated with Brigham and Women's Hospital is recruiting patients age 18 or older who suspect they may have sleep apnea but have not been previously treated with CPAP or surgery. Subjects will be enrolled for six months (maximum of 7 months) and will receive extra medical attention as well as monetary compensation. Study contact: Denise Clarke 617-527-3501 ext. 146.

Heart Failure and Cheyne-Stokes Respiration
A research study investigating a new mode of positive pressure therapy for the treatment of Cheyne-Stokes respiration during sleep. The Sleep HealthCenter® affiliated with Brigham and Women's Hospital is recruiting patients age 21-80 with

congestive heart failure (LVEF < 40%). The study involves one home study and up to four overnight studies in our sleep lab.

Study contact: Mary MacDonald 617-527-3501 ext. 162.

Restless Legs Syndrome
A placebo controlled, double blind, crossover trial to investigate the effectiveness of levetiracetam (Keppra®) in the treatment of Restless Legs Syndrome. The Sleep HealthCenter® affiliated with Brigham and Women's Hospital is recruiting patients age 18-85 who suffer from Restless Legs Syndrome (achy, creepy-crawly sensations in the legs, which get worse at night). Participation in this study involves clinic visits and four overnight sleep studies over a 14-week period. Compensation is available.

Other studies of Restless Legs Syndrome using other medication treatments are currently being run and do not require sleep studies.

Study contact: Lindsay Johnston 617-527-3501 ext. 115.