

■ ORAL APPLIANCE THERAPY

Dental Dynamics in OSA Treatment

Physicians and dentists can work together.

By B. Gail Demko, DMD

THE SLEEP MEDICINE profession is undergoing a dramatic evolution as oral appliance therapy emerges as a key treatment for obstructive sleep apnea. As a result, the role dentists can play in helping sleep apnea patients continues to increase.

Here's one barometer that reflects this trend: By 1989, there were only 11 articles in medical and dental literature about oral appliance therapy for the treatment of OSA. In just the past year, 43 English-language articles were published on the topic, covering key issues that included understanding the mechanics of oral appliance therapy, learning possible side effects and quantifying the physiologic improvement of patients who use oral appliance therapy to treat their obstructive sleep apnea.¹

Years ago, the articles published consisted of single-case presentations or presentation of data on fewer than 20 subjects.² There were few controlled studies and minimal use of placebo therapies. Today's studies are robust, featuring retrospective studies of 500-900 patients, randomized controlled trials and placebo therapies to determine effectiveness of mandibular advancement.³⁻⁵ Another key change is that, in the past, this literature was published only in dental journals and virtually unavailable to physicians. Now the majority of literature is in the medical realm.

Despite this recent increase in understanding oral appliance therapy, continuous positive airway pressure (CPAP) remains the standard of care for OSA. What has led to the predominance of CPAP therapy, which became available in 1981, just one year before the first publication of literature on oral appliance therapy?^{6,7}

Traditions and Perceptions

There are several explanations for today's treatment environment. One relates to the initial education process. Years ago, all dentists were trained in a medical school setting. After taking basic courses like pathophysiology, pharmacology and gross anatomy with their medical peers, they would then go off to learn the skills required of a practicing dentist. This led to isolation of both

groups as physicians became immersed in their hospital rotations while dentists learned "tooth by tooth" in a dental environment.

In addition, the majority of practitioners in each field opened solo practices and ministered to patients in their neighborhoods. Hospitals handled secondary and tertiary care patients referred from the primary care solo practitioner. More recently, medicine has been reshaped into large group practices that can handle the complicated medical problems and incorporate the vast medical literature written annually. Physicians also have a long history of researching various therapies and working as a team to treat patients with complicated medical problems.

Dentists, on the other hand, continued to maintain small, localized offices, remaining isolated from other practitioners. Some dentists would join study groups, their state societies and national society to maintain a close peer group and keep up with changes in the various aspects of dentistry. Dentists were not used to engaging physicians or their peers when it came to treating the typical patient, let alone those with medical problems. While dentists in specialties such as periodontics or oral surgery had much more understanding of the need to communicate with a patient's medical providers, this was not the norm for a group of professionals who were predominantly general practitioners.

Based on these cultural dynamics, physicians went to their peers in other disciplines when help was needed to treat OSA. They were not in the habit of seeking help from a dentist nor did they actually understand how a dentist could help treat patients with obstructive sleep apnea.

However, a mutual meeting of the minds can break down these barriers and create a strong camaraderie between physicians and dentists treating obstructive sleep apnea. Physicians need to understand that dentists offer a therapy that will round out their armamentarium in providing optimal care to their patients with obstructive sleep apnea. Dentists need to understand that communication with physicians about diagnosis

and medical comorbidities—as well as urging the patient to return to his sleep physician for follow-up testing—is a basic requirement in helping to provide this optimal medical care.

Compelling Research

Helping to drive the adoption of oral appliance therapy today is the wealth of research now available that illustrates how it is a very effective clinical treatment for mild to moderate OSA and also has been impressively successful in treating some patients with severe obstructive sleep apnea.⁸⁻¹⁰ Physicians understand that it is outside their scope of practice to fabricate a custom-fitted oral appliance and that custom-fitted appliances are much more effective and much more comfortable than the "boil and bite" (prefabricated) appliances available to medical providers.¹¹ Therefore, when a study of more than 56.8% of unselected patients at Walter Reed Medical Center were returned to an apnea-hypopnea index (AHI) of less than five with oral appliance therapy (confirming similar conclusions published in 2009), it underscored how oral appliance therapy often can equal CPAP in effectiveness and may offer a higher patient compliance than CPAP.¹²⁻¹⁴

In addition, oral appliance therapy has been shown to be similar to CPAP in reduction of both nocturnal and diurnal blood pressure, decreased excessive daytime sleepiness, increased quality of life measures, decreased snoring and improvement in neurobehavioral function.¹⁵⁻¹⁸

Remaining Challenges

The inability to predict which patient will be returned to an AHI below five does present problems.¹⁹ Yet, multiple studies looking at monitoring techniques such as remotely controlled mandibular advancement appliances that can be titrated during polysomnography, actual patient titration of oral appliance therapy and use of sequential home sleep testing (HST) are helping to provide understanding of patient characteristics that correlate with total control of OSA when using oral appliance therapy.^{20,22}

It must be noted, however, that an even more significant number of patients can be brought below an AHI of 10 or 15, regardless of the severity of their disease.²³ Compliance with oral appliance therapy has been shown, using patient diaries validated by covert monitoring, to be as high as 75% of patients using the appliance all night seven nights a week.^{24,25} Certainly, objective compliance monitoring is much easier to accomplish when the compliance monitor is in a CPAP machine rather than inside an oral

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cavity, though multiple studies using covert compliance monitoring in oral appliance therapy are underway in both Canada and Europe.

Yet another challenge in the use of oral appliance therapy is the current structure of medical insurance companies; some have bylaws that do not allow non-physicians/non-surgeons to become in-network providers. They also have bylaws that prevent direct payment to out-of-network providers. This often means that patients are required to pay out-of-pocket to dentists who treat obstructive sleep apnea with an oral appliance and then wait for some level of reimbursement from their medical insurance company. To this end, physicians understand that CPAP, while often being more onerous to use, may be a patient's only financial option. While these constraints are changing, it will be some time before patients have equal access to all scientifically relevant therapies.

Even anecdotal perceptions must be overcome. Physicians often are not able to see the patients who return to the dental office day after day happy, symptom-free and enthralled with their oral appli-

ance. They have heard only the complaints of patients who return to CPAP therapy after a negative experience with an oral appliance. Conversely, some dentists have the belief that there is no patient successfully using CPAP. Each view is equally invalid.

Many studies now are looking at the long-term effectiveness of oral appliance therapy. Data show that patients with an oral device for more than five years remain effectively treated.²⁶ Oral appliances have side effects and so does CPAP; in fact recent literature shows that both modalities of treatment move teeth. Oral appliances do not cause temporomandibular joint pain when properly fitted and properly adjusted. A recent study showed that patients using oral appliance therapy long term had an overall decrease in TMJ complaints while patients using CPAP had an overall increase in TMJ complaints.²⁷

Same Team, Same Page

Armed with this additional knowledge, and backed by evidenced-based research, we are witnessing increased teamwork between physi-

cians and dentists to optimally treat patients with OSA. We're confident this will continue to rise. Dentists can provide oral appliances not only as standalone therapies, but also used with CPAP to prevent mouth leaks and open the oral airway enough to allow reduction of effective CPAP pressures by 2-5 cm H₂O.²⁸ Many of the oral appliances can support struts to hold CPAP masks and nasal pillows—without the need for any head straps. This minimizes mask leaks that occur when the patient turns his head and straps move the mask.

Custom-fitted CPAP masks are another therapy dentists can offer. Patients with abnormal facial anatomy, hemimaxillectomies or unusual nasal structure would benefit significantly from the mask being fabricated using a mold of their face. There is even a device that delivers CPAP through a custom-fitted oral appliance, resulting in laminar airflow to the oropharynx, which is Food and Drug Administration-accepted for the treatment of severe OSA only. The options that

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a well-trained dentist can bring to a busy sleep practice are myriad.

Looking Forward

Dentists are aware that CPAP is the standard of care. Our goal is to optimize therapy whether oral appliance therapy is a stand-alone therapy or part of combinational therapy. Working as a team with sleep physicians, dentists can help patients accept therapy, improve medical outcomes and increase compliance regardless of treatment choice. And these are goals we all embrace. ■

Visit the resources section of www.advanceweb.com/respiratory to view references.

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