

## Wake-Up Call

### Dentistry's increasing role in airway screening and treatment

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Up to 70 million Americans suffer from one or more common sleep disorders, including 18 million with obstructive sleep apnea (OSA).<sup>1,2</sup> Dentists are uniquely positioned to screen for and help treat these maladies because they see their manifestations in malocclusions, bruxism, mouth breathing, improper tongue position or tongue-tie, and other oral disorders that significantly influence treatment in dentistry. Late in 2017, the American Dental Association (ADA) released a policy statement addressing dentistry's role in sleep-related breathing disorders (SRBDs), encouraging oral health professionals to screen patients for OSA, upper airway resistance syndrome (UARS), and other breathing disorders and to work with medical colleagues to treat them.<sup>3</sup>

### Children's Dental Health

Kevin Boyd, DDS, MS, MSc, a pediatric dentist and an attending clinical instructor at The Children's Memorial Hospital in Chicago, Illinois, says that he now assesses every new pediatric patient "for the presence of specific negative behavioral traits, such as snoring, mouth breathing, and restless sleep; specific negative physical traits, such as retrognathic jaws, high-vaulted palates, and excessive vertical growth; and also negative birth history factors, such as preterm birth, low birth weight/being small for gestational age, and a low Apgar score—all of which are known to be associated with an increased incidence of SRBD/OSA comorbidity."

Although he does not feel that he should be making treatment recommendations for SRBDs as a dentist, he says, "I think I am in an optimal position to share my experience-guided knowledge with other allied medical professionals who are responsible for making accurate SRBD/OSA assessments and providing appropriate, informed, and effective recommendations for treatment intervention."

Concerning treatment planning, Boyd says, "I now view pain that might be associated with untreated or recurrent plaque-mediated dental diseases as potentially contributing to the fragmentation of a child's sleep." He also notes that he regards the presence of malocclusion before age 7 "as a proxy signaling that there is insufficient room for a child's tongue to reside within the hard palate and away from the pharyngeal airway when asleep or awake."

Barry Raphael, DMD, of the Raphael Center for Integrative Orthodontics in Clifton, New Jersey, explains that malocclusion is a result of an imbalance in the mouth, face, or body. "In order to identify these imbalances, a complete evaluation looks well beyond the teeth at three broad factors," he says, noting that these are structure, function, and behavior. "The latter is the most overlooked, least understood, and most often avoided, but it is arguably the most important factor in aberrant growth."

Raphael adds that "a compensatory behavior, such as opening the mouth to breathe when the nose is clogged, sets into motion a host of changes in the 'functional matrix' of the face with consequent changes in both structure and function." Treatment planning is affected because "allowing a soft-tissue dysfunction like mouth breathing or tongue thrusting to continue unattended will make any orthodontic result unstable, requiring the lifelong use of retainers," he says. "Perhaps the most difficult treatment plans occur when the teeth appear to be straight and in good occlusion, but the physiology and behavior are not at all healthy," Raphael concludes. "There are cases in which 'good form' may have to be sacrificed for the sake of good breathing and sleep."

## TMD and Occlusal Problems

Tom Colquitt, DDS, an adjunct professor at the Louisiana State University Health Sciences Center and a past president of the American Academy of Restorative Dentistry, practices in Shreveport, Louisiana. He has reinvented his practice into a multidisciplinary model that is focused on detecting and correcting dysfunctional breathing in patients of all ages.

"The more that we and our like-minded dental colleagues began to screen for OSA and ask the right questions after learning what to look for relative to the "why," the more we saw younger, healthier patients who had serious sleep and breathing issues," Colquitt says.

"Lots of them have occlusal, myofascial, and temporomandibular issues, mostly related to a lack of proper development and function of all the elements of the craniofacial-respiratory complex," he explains. "Physicians either cannot or will not help restore wellness to these deserving folks. We can and will. What's the harm in looking first at each patient's structural, functional, and behavioral issues?"

In treatment planning, "our mission involves healthful breathing for all of our patients-24 hours a day," Colquitt asserts. "My maxim is to address and correct the 'why,' then fix the 'what.' The first procedure performed by every dentist, for every patient of any age, should be a proper airway examination and an evaluation of breathing function. Our primary duty as dental professionals is to promote proper breathing and general health for every patient."

W. Keith Thornton, DDS, practiced in Dallas for 37 years, focusing on the treatment of temporomandibular disorders (TMD). He was a leader in the use of splint therapy for the treatment of jaw joint pain, helped establish the Center for Pain and Sleep at Texas A&M University, and invented the Thornton Adjustable Positioner (TAP®) for sleep-disordered breathing.

According to Colquitt, "The TAP opened the door for our profession to be able to help OSA patients who had declined or were intolerant to continuous positive airway pressure (CPAP) therapy to finally get a better night's sleep." He suggests that subsequently, "the lines between dentistry and medicine began to dissolve."

Thornton suggests concentrating on how to manage the morbidity. "I have treated only sleep medicine cases for the last 15 years, and my patient population has some issues with sleep and fatigue," he explains. "Virtually all of them have a snoring problem, which is the usual chief complaint, and experience excessive daytime sleepiness. What I do is manage the TMD and occlusal morbidity, if it occurs in these patients, while also managing sleep-disordered breathing. My treatment planning is only related to managing the spectrum of sleep-disordered breathing."

## Orthognathic Surgery

Scotty Bolding, DDS, MS, an oral and maxillofacial surgeon from Rogers, Arkansas, notes that when "evaluating a patient for orthognathic problems or TMD, I focus on the airway first to establish a diagnosis and an ultimate treatment plan."

"SRBDs are a leading cause of or comorbidly associated with major health issues, such as stroke," he says. "Some studies have shown that as many as 90% of stroke victims suffer from some sleep-disordered breathing." In addition, Bolding notes that "if there are any questions regarding the patient's airway, I will always obtain a polysomnogram prior to initiating treatment because I believe that any issues associated with SRBDs will impact my diagnosis and treatment recommendations." He mentions that he is seeing more children with temporomandibular joint problems in which chronic mouth breathing may play a role.

"Orthognathic surgery, which is described by sleep physicians as maxillomandibular advancement (MMA) surgery, is backed by strong data supporting favorable results regarding improving the airway and, in many cases, eliminating OSA," Bolding explains. "Continued advancement of current techniques and careful consideration of the airway will only improve those results." He is gratified that "most third-party insurance payors in the United States now recognize the benefit of MMA and that it is a covered procedure for patients with a confirmed diagnosis of moderate or severe sleep apnea."

Mark A. Piper, DMD, MD, is a fellow of both the American College of Oral and Maxillofacial Surgeons and the American Society of Maxillofacial Surgeons who practices in St. Petersburg, Florida. He notes that global assessment of the oropharyngeal vault as a starting point for the diagnosis of airway patients has led him to several insights. "The maxilla, the mandible, and the cervical spine define the endoskeleton for the oropharyngeal vault," he says. "Both the soft tissue and the airway must share the same space within the oropharyngeal vault."

Piper suggests that dentists can play a critical role in expanding the oropharyngeal vault through mandibular repositioning appliance therapy. "The dental profession should be assessing the endoskeleton of the oropharyngeal vault, and this starts with imaging of the cervical spine for an

altered dimension," he says, noting that the profession should also "contribute to airway improvement by assessing for abnormalities within the maxillary portion of the oropharyngeal vault. As goes the condyle, so goes mandibular projection and oropharyngeal vault dimension."

Piper explains that children with disk displacement "risk deficient condylar growth and reduced oropharyngeal vault dimension" and that, in adults, "dentists should diagnose the condition of the temporomandibular joint foundations and the stability of the mandibular condyles in their assessment of the oropharyngeal vault." He notes that "oropharyngeal airway capacity is at risk with the loss of dimension of any of the three elements of the endoskeleton" and concludes that MMA "will be successful only if the mandibular component of the endoskeleton is stable."

## Restorative and Esthetic Dental Problems

Jeffrey Rouse, DDS, a faculty member in the Department of Prosthodontics at the University of Texas Health Science Center at San Antonio in San Antonio, Texas, and at Spear Education in Scottsdale, Arizona, maintains a full-time practice. "I have found that the airway explains many of the causes of erosive and attritional damage," he says. "It can even be a confounding factor in periodontal disease and caries. With an eye on the 'why,' my treatment planning can be both structurally and biologically sound."

Rouse notes that, at Spear, "We promote the examination and screening of new patients for airway dysfunctions that may help us explain oral disease, damage, and deviation from what is considered normal, and collaboration with physicians is encouraged for the management of possible apnea cases."

However, he emphasizes that dentists can still treat the tooth damage without their blessing. When a patient appears to have a dysfunctional airway, dentists should perform the dentistry that the patient requires with attention paid to improving airway volume and nasal flow.

"In cases in which I see excessive buccal corridors bilaterally, I will discuss health, sleep, and breathing issues with the patient," Rouse says. "My staff will facilitate screening with pulse oximetry or cardiopulmonary coupling. If the patient appears to have issues, a physician visit is recommended, but we are still doing dentistry."

Mark A. Cruz, DDS, of Dana Point, California, believes that the development of an optimal physiologic airway and breathing pattern requires a more holistic approach that includes an understanding of the physiologic status of the patient. "We should be treating the patient attached to the teeth rather than treating the teeth attached to the patient," he says. "How the patient develops craniofacially largely determines the risk not only for malocclusion but also, more importantly, for SRBDs, metabolic dysregulation, vascular remodeling (eg, drug-resistant hypertension), neurocognitive deficits, attention deficit hyperactivity disorder (ADHD), and increased systemic inflammation—all of which have been well documented in the medical literature throughout the last two decades."

Cruz suggests that "by fostering optimal craniofacial growth and development, the dentist can optimize facial esthetics and minimize restorative problems from biomechanical and physiologic compensations as well as promote global well-being." Concerning treatment planning, he says, "By addressing structural (eg, craniofacial phenotype), functional (eg, oral posture, mature deglutition), and behavioral (eg, breathing/ventilation pattern) risk factors with an interdisciplinary approach that integrates the interventions of dental, medical, and allied health professionals, the restorative dentist can attain predictable, patient-centric outcomes."

"Such an approach runs counter to the current, siloed, hyper-specialized healthcare approach that lacks integration and tends to foster provider-driven outcomes," Cruz asserts. "Herein lies the collective challenge."

## Dentist/Physician Collaboration

Some physicians are meeting that challenge by collaborating with dentists on SRBDs.

John Remmers, MD, is the chief marketing officer and cofounder of Zephyr Sleep Technologies in Calgary, Alberta, Canada, and an expert in snoring and OSA. "I regularly refer patients with uncomplicated OSA to my dental colleagues," he explains. "This includes all such patients who wish to be candidates for oral appliance therapy. The dentist is asked to perform a MATRx plus theragnostic study and review it with me."

Remmers's clinic generally carries out the follow-up, at-home sleep apnea testing, but he says that it also may be performed by the dentist. "I encourage all sleep dentists to attend our weekly educational activity, and from time to time, many do," he notes. "I have one-on-one sessions with sleep dentists, and they contact me to discuss difficult cases."

Remmers welcomes additional collaborations with dentists. "I believe we need a regularly scheduled sleep conference that includes both physicians and dentists," he says. "This would allow for the discussion of new topics, difficult cases, and political/economic issues. Fundamentally, such an activity would promote mutual respect and trust." In addition, he suggests that regular MATRx plus testing should be performed on most patients, which would allow the partners to "move beyond the simplistic notion that CPAP therapy is the frontline and primary therapy for OSA."

Soroush Zaghi, MD, an ear, nose, and throat specialist affiliated with The Breathe Institute in Los Angeles, California, and the University of California at Los Angeles Santa Monica Medical Center, says, "From my perspective, dentists are the primary care physicians of the upper airway. Without question, they are the best educated and most qualified practitioners to identify and manage the early signs and symptoms of sleep-disordered breathing."

According to Zaghi, "Dentists are critical not only in screening and identifying patients at risk but also in playing a hands-on role as the quarterback in managing the cases, referring to specialists when needed, and following the patients long-term." In this manner, he sees dentists as not merely collaborative, "but rather as central in the management of patients with SRBDs." Dentists can help by screening for patients at risk, referring sleep studies and other diagnostic tools, incorporating

myofunctional principles into their practice, and providing treatment with dental and orthodontic appliances.

"A comparison of the topics that were presented at this year's annual meeting of the American Academy of Dental Sleep Medicine with those that were presented at the annual meeting of the Academy of Sleep Medicine tells the whole story of dentists' importance in the field of sleep medicine," Zaghi suggests. "Most importantly, dentists will be the engines of change and progress in this field."

## Conclusion

Informed dentists recognize their increasing role in screening for issues related to the oral cavity that affect the patient's overall health, including SRBDs. In order to develop strong, medically comprehensive competencies in health promotion, disease prevention, and diagnosis, dentists are increasingly expected to practice integrative dental medicine.

Dental schools continue to make their curricula more medically comprehensive and integrative, "clearly based on evidence that the practice of dentistry is changing and will continue to change from a surgical model to more of a medical model that emphasizes prevention and the understanding of disease etiology and pathogenesis," says John Crawford, BDS, PhD, a professor emeritus in the Department of Periodontics at the University of Illinois at Chicago College of Dentistry.

Integrative dental medicine looks at the dental patient as a whole person. Dentists who are playing more of a "primary care" role in the treatment of SRBDs, both during a patient's childhood and adulthood, are and increasingly will be a key focus of integrative dental medicine. This paradigm shift affords a significant opportunity to elevate the contribution of dentistry in comprehensive healthcare, providing a central hands-on role for oral healthcare professionals to improve the overall health of their patients.

## References

1. Cleveland Clinic. Common sleep disorders. <https://my.clevelandclinic.org/health/articles/11429-common-sleep-disorders>. Updated October 20, 2013. Accessed December 10, 2019.
2. National Sleep Foundation. Sleep apnea and sleep. <https://www.sleepfoundation.org/articles/sleep-apnea-and-sleep>. Accessed December 10, 2019.
3. American Dental Association House of Delegates. The role of dentistry in the treatment of sleep related breathing disorders. <https://www.ada.org/~/media/ADA/Member%20Center/Files/The-Role-of-Dentistry-in-Sleep-Related-Breathing-Disorders.pdf?la=en>. Published October 23, 2017. Accessed December 10, 2019.