# The view of a dental sleep medicine clinician and researcher of the future of our field.

Fernanda Almeida

Sleep apnea diagnosis and treatment has been questioned lately by the AHRQ draft and with no doubt has brought clinicians and scientist to re-think about the disease and how to improve treatments, quality of life and health of sleep apnea patients.

Starting with the AHI, this has been an imperfect but helpful metric. Various studies have shown that the AHI does not correlate to sleepiness or quality of life, and in mild to moderate cases the AHI doesn't highly correlate to morbidity after adjusted for BMI, symptoms and hours of sleep. The AHI will not be abandoned, but further variables are required to better describe the disease. Malhotra and colleagues[1] (Sleep 2021) have nicely shown differences of patients with the same AHI, but very different in apnea/hypopnea ratios, oxygen saturation, heart rate response and sleep architecture/fragmentation, describing the current flaws of AHI as a sole metric to assess OSA. While dental sleep medicine seems far away from this, one has to remember is that we also describe the efficacy of oral appliance based solely on the AHI. The future of dental sleep medicine in relation to the diagnostic metrics, will be to further understand the impact of OA on these new metrics for defining the disease and thresholds of normality. As an example, if one patient has mostly apneas, and changes to have mostly hypopneas, the apnea/hypopnea ratio will change. What is the impact of this on oxygen saturation, heart rate response and sleep architecture/fragmentation? What is the percentage of improvement in those domains that correlate to an improvement in overall health and symptoms and long term morbidity and mortality?

Patient-centered medicine is a new term in the sleep apnea field, but highly studied in other areas of medicine (Hilbert ad Yaggi Sleep Med Rev. 2018).[2] With the move to better understand patient preference and values, a lot may change in dental sleep medicine. Oral appliances are easy to use and shows a higher adherence rate for the first 2 years. The future of sleep apnea treatment will involve the patient in the decision making process and also to well educate the patients for long term disease management. As we are all aware, sleep apnea, as many other diseases, is not static, as patients age, gain or loose weight, develops new comorbidities, treatment should be re-adapted. Patients and family doctors need to allow flexibility in treatment strategies to further improve treatment adherence and with that, allow for a long term improvement in morbidity and mortality.

To improve treatment strategies, Hamoda and colleagues[3] (ATS 2022) have shown that the alternating use of CPAP and OA leads to a sustained adherence and efficacy after at least 6 month of treatment when compared to CPAP or OA alone. The major problem of this study is the economic side of treatment, where CPAP has decreased its cost slightly but not OA. Adding the two treatments is very costly. If the future of OSA management will include combination therapy, as together or alternating of various therapies, the treatment costs needs to decrease in all fronts. Oral appliance laboratories may be able to decrease the cost, likely if production volume is higher with more patients on oral appliance. But what about dentists?

OA therapy has to become simpler rather than more complex, and cheaper. New developments in the field are likely going to help. One of the biggest costs of OA therapy are the multiple appointment for treatment titration at the dental office. With the new development of intra-oral sensor as well as

wearables that have standardized measurements and questionnaires, the patient will receive an appliance which has compliance and efficacy sensors, a comprehensive training with good instructional materials, then have a one or two adjustment appointments for addressing possible side effects. This will be followed by self-titration, where patients will be able to advance the mandible until ideal or close to ideal efficacy and comfort is achieved. At this point, a follow-up by the dentist and physician can help patient navigate through the treatment strategies based on the efficacy and comfort of the different treatments recommended. It is important to state that the efficacy chased be the titration in this case, is not solely based on an AHI, but instead on hypoxia burden, sleep quality and symptomatic improvement. Also if the treatment will not be used alone, but as an example alternating to CPAP, some small improvement in objective metrics together with a high symptomatic improvement and high adherence rates, may already be enough for the purpose of 2 night of use per week.

Will the new gadgets be able to do it all? Are the patients going to feel comfortable in driving their treatment? Maybe not all, but for sure, the new generations will, and it is important for us, health care providers, to understand that the public is higher and higher educated on how to navigate apps and gadgets that measure sleep and health conditions. As an example is the management of diabetes, and with continuous measurement of blood sugars, patients have been enabled to better control their chronic disease. This is likely the future for sleep apnea treatment as well.

In summary, what do I believe the future will bring. New and better diagnostic metrics will improve our understanding of disease severity and who should actually require treatment. Patients will then receive education and options of treatment to choose from, being those one or multiple treatment approaches to be used in combination or as alternating approaches. If oral appliance is an option considered by the patient, a dentist will provide the treatment, address possible side-effects and help the patient move to the following months of self-titration. Treatment goals will involve more than AHI or ODI, and oral appliance together with new gadgets will help patients find their best treatment strategy. When used in combination, a fully effective treatment may not be necessary. The dentist should, in an unbiased approach, help the patient decide on how to combine and decide on treatment strategies. Yearly follow-ups should occur to assess continuation of treatment (not OA adherence only), monitor side effects and possible changes in the treatment protocol.

References:

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