

# Mandibular movement monitoring may help improve oral sleep apnea devices

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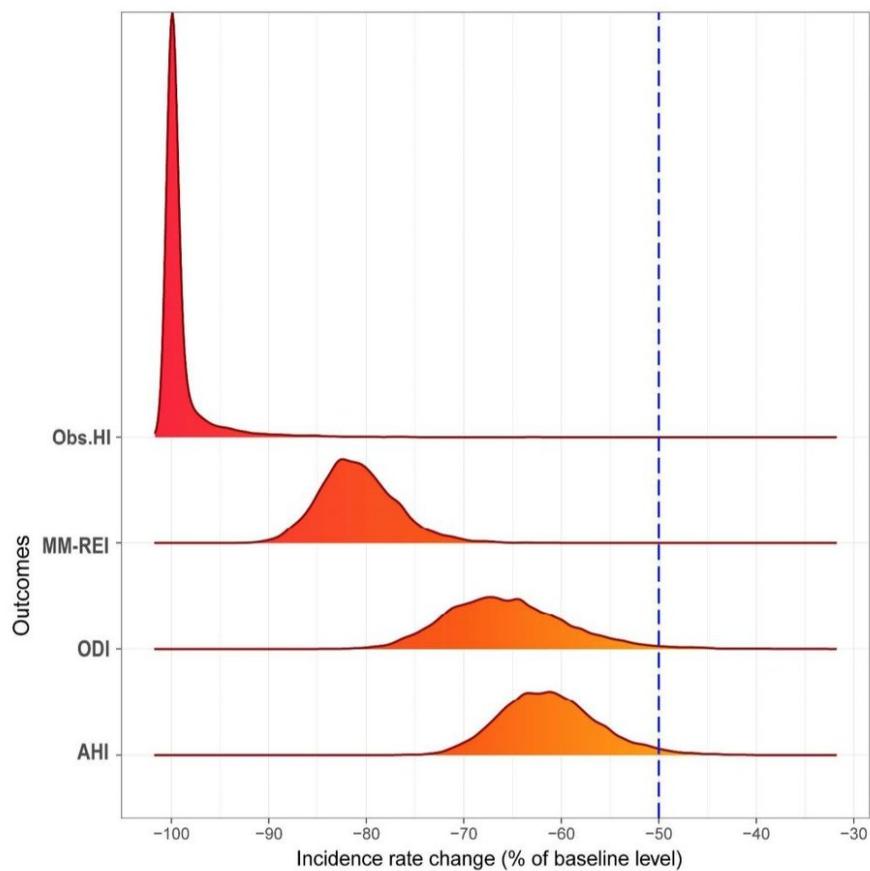


Chart showing the changes from baseline found in subjects during the study.  
Credit: *CHEST*

While continuous positive airway pressure (CPAP) continues to be the gold standard for treatment of sleep apnea, the cumbersome machines are often not well tolerated by patients. Because of this, less obtrusive oral appliances that thrust the jaw forward during sleep are becoming more popular. Mandibular protrusion enlarges the pharynx and stabilizes the upper airway. A new study in *CHEST* demonstrates that mandibular movements (MM) monitoring can be used to assess the efficacy of these oral appliances.

MM during sleep are accurate reporters for increased respiratory effort and micro arousals found in people with sleep apnea. In this sleep study, 56 [patients](#) with obstructive [sleep apnea](#) (OSA) were fitted with a custom mandibular advancement splint (OAT) and had their midsagittal mandibular movement tracked. Patients were evaluated at the end of the titration procedure. During the titration procedure different degrees of advancement are trialed up and down to find the single best amount to control apnea events for that patient.

"The novelty of the study related to tracking sleep MM in order to assess [oral appliance therapy](#) effectiveness," explained lead investigator Jean-Benoit Martinot, MD, Sleep Laboratory, CHU UCL Namur Site Sainte-Elisabeth, Namur, Belgium. "Our study suggested for the first time that MM [monitoring](#) represents a powerful tool for assessing the efficacy of OAT treatment."

Investigators found that by the end of titration, all indications of OSA decreased compared with baseline. Overall, patients showed a reduction of vertical respiratory MM and sleep respiratory effort, as well as a dramatic decrease in obstructive hypopnea. Scores from the apnea-hypopnea index and oxygen desaturation index also dropped.

"Using MM measurements in the oral appliance titration procedure has the potential to optimize the benefit/risk ratio of oral appliances," said

Dr. Martinot. "There is a high interindividual variability in response to the oral appliances, and it is difficult to predict the range of responses without proper measurement."

Researchers also found that MM monitoring helped to reveal the presence of central apneas. They found in a subgroup of subjects a decrease in respiratory effort, but no improvement or an increase in sharp and sudden MM of high amplitude, which indicates persistent sleep fragmentation. This is highly suggestive of emergent central apneas and may shed light on a possible predictor for poor response to OAT.

With new technology on the horizon, MM monitoring could potentially represent a cost-effective and easy-to-implement tool for sleep clinics to use when titrating oral appliances. "MM monitoring during sleep is practical and informative for measuring indices of residual respiratory events when OSA is treated by oral appliances," concluded Dr. Martinot. "Given the growing use of this treatment as the primary alternative to CPAP, these data are relevant for sleep clinicians."

**More information:** "Mandibular Movement Analysis to Assess Efficacy of Oral Appliance Therapy in OSA," *CHEST* (2018). [DOI: 10.1016/j.chest.2018.08.1027](https://doi.org/10.1016/j.chest.2018.08.1027)

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