

Mandibular Advancement Devices vs CPAP in Severe Sleep Apnea

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Scope of this document

This is a clinical overview of how mandibular advancement devices (MADs) and continuous positive airway pressure (CPAP) compare in the management of severe obstructive sleep apnea, written for referring physicians and for patients who have been told they need treatment. It summarises accepted practice and the reasoning behind device selection. The author's prospective study of patients with obstructive sleep apnea treated with mandibular advancement devices is a separate work and is forthcoming; no results from it are reported here.

The clinical problem

In obstructive sleep apnea the upper airway repeatedly narrows or closes during sleep. Each event fragments sleep and drops blood oxygen saturation, and over years the pattern is associated with hypertension, cardiac arrhythmia, stroke risk, metabolic disturbance, and daytime impairment. Severity is graded by the apnea-hypopnea index (AHI): severe disease is conventionally an AHI of 30 or more events per hour.

CPAP

CPAP delivers pressurised air through a mask and splints the airway open pneumatically. It is the reference standard for severe obstructive sleep apnea because, when it is worn, it can control events across the whole night at almost any severity. Its limitation is not efficacy but adherence: mask discomfort, nasal congestion, aerophagia, claustrophobia, bed-partner disturbance, and travel inconvenience all lead patients to reduce or abandon use, and a device that is not worn provides no protection.

Mandibular advancement devices

A MAD is a custom-fitted intraoral appliance that holds the mandible, and with it the tongue base and soft palate, in a protruded position, enlarging the retroglossal airway. Appliances are titratable, so advancement is increased in small increments and the response confirmed objectively by repeat sleep testing. Because the device is small, silent, and needs no power, nightly adherence is typically higher than with CPAP.

Comparing the two in severe disease

- Efficacy per night of use: CPAP is more complete, particularly at high AHI.
- Adherence: MADs are generally tolerated for more hours per night.
- Effectiveness is the product of the two, which is why a well-titrated MAD can deliver a clinically meaningful result in a patient who will not wear CPAP.
- Anatomy matters: retrognathia and tongue-base collapse respond well; concentric velopharyngeal collapse and high BMI respond less predictably.
- Combination therapy — a MAD permitting lower CPAP pressures, or a MAD used for travel — suits selected patients.

How treatment is selected

Diagnosis and severity grading are made by the sleep physician on attended polysomnography or home sleep apnea testing. Dental evaluation then assesses dentition, periodontal support, restorative status, temporomandibular joint condition, and range of protrusion, supported by cone-beam imaging of the airway where indicated. CPAP is offered first in severe disease. A MAD is indicated where CPAP has been tried and not tolerated, where the patient declines CPAP outright, or as an adjunct — and the decision is made jointly with the referring physician.

Follow-up

Appliance therapy is titrated over weeks, not fitted once. Objective re-testing on the appliance confirms the treated AHI and oxygen saturation; dental follow-up monitors occlusal change, joint symptoms, and appliance integrity. Where a MAD does not adequately control severe disease, the patient is returned to the sleep physician for reconsideration of CPAP, combination therapy, or surgical and neurostimulation options.

This overview is general clinical information and is not a substitute for diagnosis or individual medical advice. Obstructive sleep apnea should be diagnosed and its treatment supervised by a qualified sleep physician.

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