

# Which Costs More: CPAP or Oral Appliance Therapy?

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## A recently presented abstract on obstructive sleep apnea therapies has results that may surprise you.

*By Lisa Rapaport*

Even as oral appliance therapy (OAT) gains traction among sleep specialists as a viable alternative to CPAP for patients with mild to moderate obstructive sleep apnea (OSA), cost concerns remain a roadblock to adoption for many patients and clinicians.

Part of this is because, like so much in medicine, pricing isn't transparent. Total costs of OSA treatment with both CPAP and OAT can vary based on the exact devices used as well as by payor, provider, and region. Out-of-pocket costs also vary wildly based on the exact details of patients' insurance benefits. All of this makes it difficult to do an apples-to-apples cost comparison.

A cost analysis of these two OSA treatment options presented at the [2021 Virtual Annual Meeting of the American Academy of Dental Sleep Medicine](#) attempts a true head-to-head cost comparison. This analysis, based on Medicare fee schedules, suggests that CPAP may be cheaper initially but that OAT comes with fewer costs over time.<sup>1</sup>

“We had never seen anyone do the math on how much the full cost of three to five years of PAP [positive airway pressure] therapy would be,” says study author Len Liptak, MBA, co-founder and CEO of oral appliance maker ProSomnus Sleep Technologies. “We hypothesized that after we added up the mask, hoses, humidifiers, filters, and other recurrent costs, PAP would be more than OAT.”

The analysis calculated an average daily reimbursement rate for CPAP and OAT by dividing the reimbursement fees for these items by the replacement interval duration based on the Medicare fee schedule or publicly available warranty durations. Calculations used simple averages to account for differences in reimbursement rates by regions and other variations in costs within the fee schedule.

## Daily Costs

Based on the Medicare fee schedule of the devices alone, CPAP would look much less expensive than OAT, with an average reimbursement of \$42.46 for the CPAP machine versus an average reimbursement of \$1,429 for OAT, according to this analysis.

Factor in the replacement schedule, and the difference remains dramatic, favoring CPAP as far less expensive. The CPAP machine replacement schedule is 1,095 days, which, divided by the average reimbursement amounts to a daily cost of \$0.04. With a replacement schedule of 1,825 days, OAT has a daily cost of \$0.78, the analysis finds.

But reimbursement for OAT is a singular structure, and inclusive of the device as well as professional services associated with administering, adjusting, and monitoring treatment over five years, the analysis notes.

By comparison, the reimbursement structure for CPAP consists of a series of distinct codes for components that are itemized separately from the machine. Some of these components may cost more than the machine itself. The mask, for example, has a 90-day replacement schedule and an average reimbursement of \$89.67, for a daily cost of \$1.00. And the mask cushion has a replacement schedule of 30 days and an average reimbursement of \$34.48, for an average daily cost of \$1.15.

Average daily costs for these components, as well as the mask nasal pillows, tubing, headgear, and disposable filters bring the daily cost of CPAP to \$2.99, more than triple the daily cost for OAT.

One limitation of the analysis is it doesn't include costs for several common CPAP upgrades such as chin straps, humidifiers, water chambers, and heated tubing.

Another limitation of this analysis is costs can vary based on individual patient needs. If, for example, a patient needs a bilevel PAP, the daily cost would rise to \$3.20, more than four times more expensive than a standard OAT.

## **Costs Over Time**

Beyond daily costs, the analysis also looked at what happened over five years, the typical replacement timeline for OAT. CPAP initially looks more affordable over the first three months of treatment. At four months, however, total costs of CPAP and OAT are similar at about \$1,500.

After this point, there are no additional costs for OAT and CPAP costs continue to rise as various components require replacement, the analysis finds. By the end of five years, CPAP costs about two to three times more than OAT.

It was surprising how quickly oral appliances started to appear less expensive, and how large the cost discrepancy became over time, Liptak says.

“We thought oral appliances would cost less in the long run, but not so quickly in the lifecycle or by so great a margin.”

There are other limitations to this analysis, including the need for additional clarity around the relationship between replacement schedules and device warranties. At the time of the analysis, for example, only one PDAC-verified OAT device, a precision Herbst-style device, had a warranty period that matched the reimbursement schedule. All other PDAC-verified oral appliances had warranty durations of three years or less. This raises the question of who absorbs the cost burden if the device fails after the warranty has expired but before a new device is covered.

## Regional Cost Variation

Another drawback of this analysis is Medicare reimbursement rates may not reflect what costs would look like with private payors. In addition, an analysis based on average reimbursement rates nationwide doesn't reflect what can be quite stark regional differences in costs.

“There is huge variability in cost to the patient, and there is variability in whether or not OAT will be covered at all,” says [Meir Kryger, MD, FRCP\(C\)](#), a professor and sleep physician at Yale School of Medicine and the VA Connecticut Health System, who wasn't involved in the study.

It's fair to assume that if an oral appliance works and it lasts for five years, there won't be any additional costs, Kryger says. And it's pretty typical for an oral appliance to last for five years, he adds.

But patients and sleep clinicians need to consider local costs, not national averages, when thinking about how the costs of CPAP will add up relative to OAT, Kryger says.

Where Kryger practices in Connecticut, for example, OAT costs between \$2,000 and \$3,000, he says. That's far less than in neighboring New York, where he says oral appliances can cost between \$4,000 and \$5,000.

With CPAP, buying the machine outright can cost about \$900 to \$1,000, which, depending on the payor and benefits structure, can actually wind up being less than what the patient would pay out-of-pocket by using their insurance, Kryger says.

## Cost of Noncompliance

The disparity between costs for CPAP and OAT are historical and well known, says Gregory Olk, MBA, director of marketing in North America for oral appliance maker SomnoMed. But there's one factor missing from the analysis that could dramatically skew the relative costs, Olk says.

This crucial missing element is the wild card that is patient behavior.

“Any therapy is especially costly when it isn’t working,” Olk says. “While the costs of *not* being treated for any disease state may be difficult to quantify, the result of avoiding effective OSA treatment can be devastating to the patient and the patient’s family.”

While there are obvious negative health and financial consequences of untreated obstructive sleep apnea that may be easy for sleep physicians and their patients to grasp, it can be harder for patients to anticipate the surprise bills that may come with CPAP, but not OAT, Kryger says.

Medicare and other payors require face-to-face visits to verify that patients use CPAP for a minimum of four hours on 70% of nights. CPAP machines collect and transmit data to clinicians on the frequency and duration of use. With OAT, clinicians rely on patients or their partners to self-report utilization data.

“If the patient is not compliant, [CPAP] won’t be covered any longer and the machine will be taken away,” Kryger says, which is not the case for OAT.

Studies have illustrated that patients are [more likely to adhere to oral appliance therapy](#) than CPAP,<sup>3</sup> says Anthony Dioguardi, DMD, who practices general dentistry and dental sleep medicine at Downtown New Haven Dental in Connecticut and who wasn’t involved in the study.

Better adherence not only makes treatment more effective at controlling OSA for some patients, it also may mean that the true cost of OAT is far less than CPAP. This is especially true after factoring in the sunk costs for a machine that’s ultimately taken away, Dioguardi says.

The bottom line is that costs are a reality that many patients must consider when choosing treatment alternatives. Insurance reimbursement schedules, clinical requirements for reimbursement, and co-pays often favor CPAP treatment and influence decisions, Dioguardi adds.

Given the numerous costs associated with CPAP over time, as compared with the fixed and single up-front payment for OAT, Dioguardi isn’t at all surprised that the study found CPAP to be more expensive than OAT.

“A CPAP is a bit like purchasing a computer printer,” Dioguardi says. “Although the initial purchase price might seem low, the ink cartridges are expensive and must be replaced regularly.”

*Lisa Rapaport is a freelance journalist with experience writing and editing news about health, medicine, wellness, and science.*

## References

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2. Saglam-Aydinatay B, Taner T. Oral appliance therapy in obstructive sleep apnea: Long-term adherence and patients’ experiences. *Med Oral Patol Oral Cir Bucal*. 2018 Jan; 23(1): e72–7.

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