

Continuous Positive Airway Pressure (CPAP) vs Automatic Positive Airway Pressure (APAP)

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As we delve into the specifics of PAP (positive airway pressure) treatments for OSAS, this article begs to relay the differences in efficacy of CPAP (continuous positive airway pressure) vs. APAP (automatic positive airway pressure).

We shall begin with a subtle review of sleep apnea. Sleep apnea is a condition where there is an obstruction to the flow of air (and oxygen) during sleep, resulting in poor night time sleep and consequent daytime sleepiness. Should sleep apnea remain uncontrolled, this may contribute to elevated blood pressure, and an increased risk of stroke and heart attack.

The treatment of choice for OSAS has primarily and historically been CPAP (continuous positive airway pressure). CPAP is the only 100% effective therapy in treating OSAS. We shall attempt to make comparisons to investigate the differences, pros and cons, and efficacy of treatment between CPAP vs APAP.

CPAP devices are titrated to a single set pressure setting by a sleep specialist. The titration study is conducted after a traditional in-lab polysomnogram test and is intended to solicit the exact pressure setting needed to alleviate or eliminate the majority, if not all apnea events during the night.

Contrary to the delivery of a single set pressure, APAP machines have a complex algorithm that detects on a breath-by-breath basis what pressure the patient needs at that and adjust accordingly. In essence, the APAP device finds the ideal pressure for any given moment.

It could be argued that one of the “cons” of CPAP that the single pressure may be cumbersome to tolerate (especially at higher settings), and doesn’t adjust to varying pressure needs throughout the night. More and more frequently APAP devices are being prescribed in lieu of CPAP devices because of their versatility and ability to adapt to patient needs over the course of the night.

While APAP machines are costlier, APAPs can also be set to a single pressure. If for some reason APAP therapy isn’t working well for the patient, they wouldn’t need to get a different machine. APAPs can be set to a straight CPAP mode. CPAP devices on the other hand are unable to be adjusted to have multiple pressure settings.

APAP machines may be better intended for those that toss and turn during the night. Due to gravity, when you are supine you will have the most number of respiratory events in this position vs. being lateral or prone. This being said, the APAP automatically adjusts the pressure upward when severe events are detected and lower accordingly after positional and respiratory changes are apparent.

CPAP machines do not allow for physical changes, such as weight loss. It is recommended that if you have a 10% increase or decrease in body weight that the subject should undergo another evaluation to determine if a pressure increase or decrease is warranted. APAP devices can help eliminate the need for expensive in-lab sleep tests.

When you have a Home Sleep Test (HST) you will most likely be prescribed an APAP device. This is because HSTs can't determine which stages of sleep you are in. As previously discussed, CPAP devices are calibrated for breathing needs when you're at your worst (during REM sleep). HSTs score a period of your breathing needs through the course of the night to determine which range you need. With APAP, the range can later be fine-tuned with remote monitoring.

APAP therapy is swiftly becoming the go-to machine for treating OSAS as the technology becomes better developed. However, there are some instances where CPAP device may be the better choice:

- APAP manufacturers use a different algorithm to determine the patient's pressure ranges. This may make it difficult for some doctors to determine the best machine for their patients.
- The changes in pressure settings can ultimately be slow to react to the ideal pressure needs.
- APAP machines are not ideal for patients who, once starting treatment are discovered to have central sleep apnea; in which case an ASV or BiPAP machine may be the better suited.
- For patients with certain comorbidities, APAP machines are not recommended. These would include conditions such as chronic heart failure or obesity hypoventilation syndrome.
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