

 **SOUND SLEEP HEALTH**

CPAP, APAP, BiPAP, and ASV Therapies : Costs, Problems, and Options

An introduction to the different types of PAP therapy for Sleep
Disordered Breathing.



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How does a CPAP machine work?



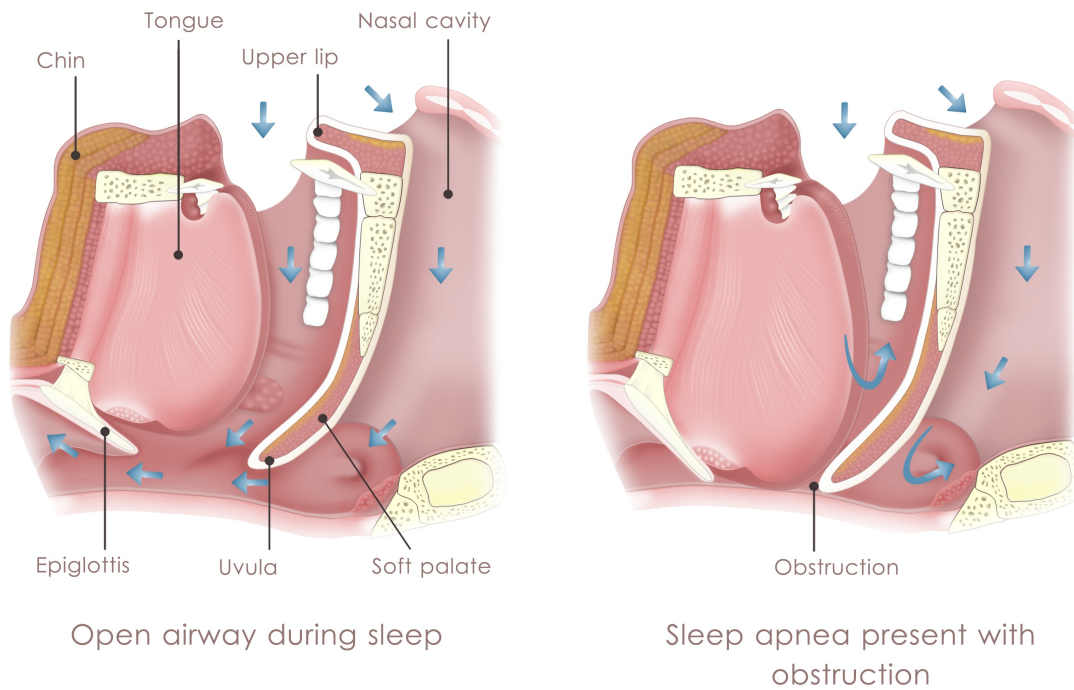
Obstructive sleep apnea (OSA) is a sleep disorder of breathing mechanics.

In order to treat it, the simplest, and most effective, solution is to use a mechanical therapy that falls under the category of positive airway pressure (PAP).

CPAP, [APAP](#), BiPAP, and ASV are all versions of this kind of therapy.

How these different PAP treatments work relates to how [sleep apnea](#) occurs in the first place. Let's review what sleep apnea is, how a PAP machine operates, and how the mechanisms of this therapy treat OSA.

Sleep apnea 101



At night as you sleep, your brain switches to an automated system that allows you to breathe once you are unconscious. However, if your body experiences obstacles to breathing as you sleep, it will wake itself up so that you can consciously take a breath to remove these obstacles.

What is sleep apnea?

An apnea is a pause in breathing that lasts more than



10 seconds and which leads to an unhealthy drop in blood oxygen. Sleep apnea, as

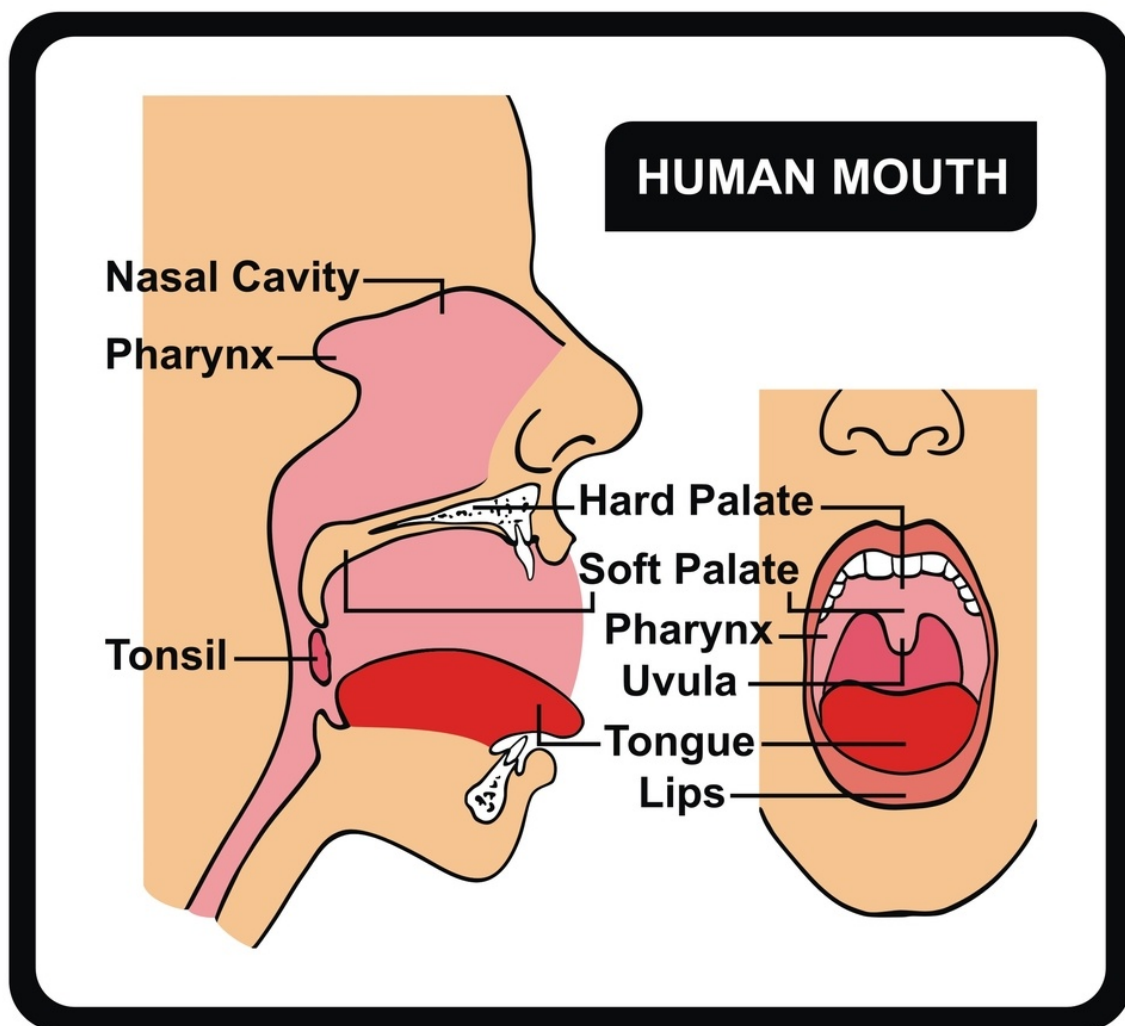
the name suggests, occurs only as you sleep.

In the case of **obstructive sleep apnea (OSA)**, there is an obstruction in the upper airway that is blocking the passage of air into or out of your lungs as you sleep.

The body itself may continue to try to breathe, but the obstruction prevents any oxygen from entering the bloodstream (or any carbon dioxide from being exhaled).

This creates a chemical imbalance in the body which leads to alerts to the brain to "wake up" to breathe.

What causes these obstructions?



The most common obstructions during an apnea take place in the upper airway at the back of the throat. The tissue is relaxed here during sleep, which can lead to problems if the **tongue has dropped into the back of the throat**, or the airway itself has been **crowded by overlarge tonsils or uvula**.

Some people also have **very narrow passageways** to begin with, and the space itself is compromised during sleep for this reason.

Those with **added fat around their neck**, while in a *supine* position (on the back) are also vulnerable, as **gravity and weight press against the soft, often floppy, tissues** surrounding the airway, creating obstruction.

And any time the **tissues of the airway are inflamed or swollen** or otherwise affected (such as **congestion, allergies, or asthma**), the risks for encountering obstructive apneas go up.

What is central apnea?

In the case of **central sleep apnea (CA)**, the signals from the brain to the diaphragm to breathe as you sleep are thwarted, leading to no airflow and no effort to breathe. Eventually, the same alarms are sounded in the body and the brain sends you back to consciousness to take a necessary breath to correct the problem. CA is not a mechanical problem, then, but a neurological one.

CPAP to the rescue

You can think of CPAP as a kind of "pneumatic splint." Positive airway pressure forces a stream of pressurized air into the back of the throat which helps keep the airway open and the tissues firm, rather than floppy. When you use CPAP, it's not actually breathing for you, it's just helping to recreate the proper conditions so that you can breathe for yourself.

How CPAP machines work

The original CPAP machine was devised using a reversed vacuum cleaner technology back in the 1980s, believe it or not. The concept still works, though today's machines are far more sophisticated and comfortable to use.

Here's



how it's done:

- *Inside the machine is a simple motor which draws air in from the room, then pressurizes it*
- *Once the "room air" is pressurized, it's sent (usually) through a humidification chamber, which warms and moisturizes it to make it more comfortable to the airway*
- *This humidified air is sent by way of a length of tubing to the CPAP mask to deliver directly to the user through the nose (or, in the case of full-face masks, through both nose and mouth)*
- *The incoming stream of air pressure opens up the airway and allows you to breathe independently while asleep, without obstruction*

How much pressure is delivered?

Pressurized air is metered by a preset number that has been programmed into the CPAP machine by a sleep specialist. For many people, the force of the air is gentle, but effective.

Others with moderate to severe sleep apnea may have higher settings or more complicated sleep-breathing problems which lend themselves to the use of the other PAP therapies, such as [BiPAP](#) or ASV. The only way to know which therapy works best for you is through testing and consultation with a sleep specialist.

Bottom line: CPAP saves lives



For millions of people with sleep apnea, PAP has become a lifesaver in this way.

In fact, at sleep centers everywhere, there is a common refrain among long-time CPAP users: "I won't sleep without it!" [CPAP support groups](#) are a great way to connect with these "super users."

Despite the challenges that some have with adjusting to the therapy, it still remains the most simple, effective, and noninvasive way to treat sleep apnea.

While some discomfort may temporarily be part of the experience, the long-term effects of untreated sleep apnea are far worse. [Brain damage](#), [hypertension](#), [mood disorders](#), [sleep deprivation](#), heart disease, and diabetes are just a few of the problems you can expect.

Treating sleep apnea is as simple as understanding its mechanical dysfunction and correcting it using a mechanical therapy. CPAP and its other cousins in the PAP lineup of therapies are considered the first line of defense against sleep apnea

precisely for this reason: these approaches are simple, noninvasive, and effective.

If you suspect you might have sleep apnea, please consider addressing your concern with a sleep specialist. In the meantime, if you aren't sure, you can take the easy, free sleep apnea test below to determine whether you might have a problem.

Using Auto-CPAP (APAP) Therapy



[Obstructive sleep apnea \(OSA\)](#) can be difficult to treat. Finding the perfect air pressure setting for some patients can be a real challenge. For this reason, many physicians prescribe an Auto-CPAP (or APAP) machine instead of a CPAP delivery system, because they put their trust in the “smart technology” that comes with auto-titrating devices.

While CPAP offers only one fixed setting with a ramping feature and C-Flex option

to help with patient comfort, Auto-CPAP offers a range of settings that adjust based on the breathing patterns of the users.

It's become common practice these days for a physician to initiate an [HSAT \(Home Sleep Apnea Test\)](#) for potential OSA patients, and follow through on a confirmed diagnosis by prescribing the use of the Auto-CPAP or APAP therapy *instead of* scheduling a titration at the lab. This model bypasses CPAP altogether.

Many physicians believe this practice is in their patients' best interests. It is based on concerns regarding low CPAP compliance rates and data that shows APAP or Auto-CPAP is far more user-friendly. And the convenience and cost savings of going straight to auto-titration cannot be overlooked.

However, this technology, like every other PAP therapy, does have its limitations.

Disadvantages to using APAP or Auto-CPAP

Technology variables

APAP and Auto-CPAP machines are n



hypopnea, and flow limitation. They also identified variables in machine performance.

General consensus in that study said that, while all the devices examined showed the potential to treat OSA and lead to a positive outcome, there was no standardized way to differentiate which device would best relay the “appropriate” pressure response to a patient's unique breathing issues.



This begs the question: Even if all these different devices work, they work differently... How can doctors know which is the best among them for treating the specific needs of their individual patients?

Since then, some manufacturers have been more specific about the way their machines work without giving out too

much proprietary information, and that has been useful.

But by no means should a physician assume these different makes and models all

work in the same fashion. Nor should they consider a "one-range-fits-all" approach is in the best interest of their patients.

Fortunately, a knowledgeable sleep technologist or PAP educator, in consult with the prescribing physician in their [sleep medicine team](#), may have enough familiarity with the latest differences in auto-titration technologies to help determine which system is best.

Timing of pressure delivery

All patients have changes in their pressure needs throughout the night. However, some patients' changes are much more distinct. One consequence is that APAP therapy or Auto-CPAP may not be able to deliver the appropriate pressure to them in a timely fashion when respiratory events take place.

The most noticeable problems occur during REM sleep. Patients may not be able to tolerate slow changes in pressure at these critical moments, and this can lead to frequent respiratory arousals, complaints of discomfort, and a lower overall compliance rate, if the problem is not corrected. This is why monitoring APAP or Auto-CPAP users' data is key.

One strategy to counteract slow response times to severe apneas is to monitor the patient, paying special attention to baseline pressures. These lower pressures can be raised within the patient's comfort zone to close gaps when severe events occur and can lead to improved sleep and compliance.

It's worth noting that patients who *only* experience episodes of apnea *while supine* or *during REM sleep* may actually benefit from a precisely tuned auto-titration device rather than a fixed-pressure delivery system like CPAP.

Healthcare costs



Because they are a “smarter” technology, APAP machines generally cost more than CPAP machines. Though insurance companies are more inclined to recognize and pay for the benefits of auto-titration due to its usually higher patient adherence percentages, some insurance companies may still dictate that a patient must first “fail” CPAP before they pay out for auto-titration. And some patients may simply not have coverage for this technology.

Some patients cannot use APAP therapy or Auto-CPAP

Patients with chronic heart failure, central sleep apnea, and obesity hypoventilation syndrome are not safe candidates for APAP; the unique challenges to their breathing while asleep can be aggravated using auto-titrated therapy.



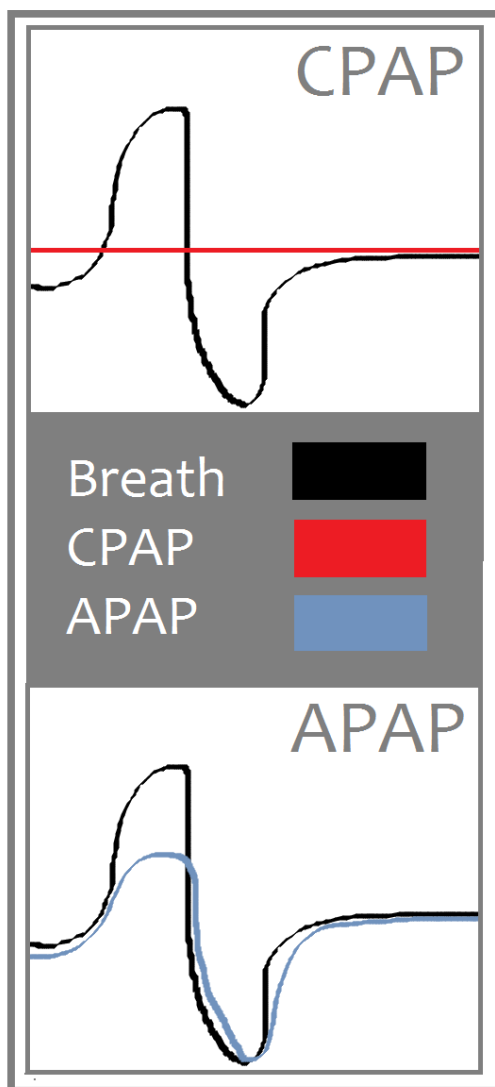
Like other PAP therapies, using Auto-CPAP and APAP therapy will still require fine tuning. Choosing a machine with a technology you understand, and one which includes long-distance monitoring to help your team manage adjustments, will help you give your patients the best possible therapy.

But this will require regular observation and thoughtful adjustments until that perfect pressure range can be established, which hardly makes APAP or Auto-CPAP a set-and-forget therapy.

Here at Sound Sleep Health, matching the right patient to the right therapy is a top priority. We have 3 locations in the greater Seattle/Kirkland areas. We hope you'll reach out to us with your sleep health concerns. Improve Your Sleep Today by calling (425) 296-6194.

FAST FACTS: The difference between APAP and CPAP

If you are diagnosed with a pretty straightforward case of [obstructive sleep apnea \(OSA\)](#), you may be prescribed positive airway pressure (PAP) therapy for treatment. Those who qualify for CPAP therapy may often qualify for APAP. What is the difference between the two treatments?



CPAP: As its name suggests, continuous positive airway pressure (CPAP) delivers pressurized air at a constant stream. This constant stream helps keep the upper airway open during both inhalation and exhalation. You can think of the air pressure in CPAP as being constant.

APAP: On the other hand, automatic positive airway pressure (APAP) delivers a preset range of air pressure which closely matches your breathing pattern, which has a wave-like motion. You can think of the air pressure in APAP as adjustable to the range of your breathing.

Both types of PAP therapy are effective in preventing apneas. You may start on or switch to either device based on your sleep specialist's recommendation or as a matter of preference (if APAP is more comfortable for you, for instance, then you are more likely to use it).

[LEARN MORE ABOUT APAP & CPAP HERE](#)

- [How does a CPAP machine work?](#)
- [Using Auto-CPAP \(APAP\) Therapy: It's not a set-and-forget option](#)
- [FAST FACTS: THE ABCS OF POSITIVE AIRWAY PRESSURE](#)

When is BiPAP therapy the best treatment?



It's fairly common for those who are newly diagnosed with [obstructive sleep apnea \(OSA\)](#) to be placed on continuous positive airway pressure (CPAP) therapy to treat it. CPAP is considered the gold standard for treating OSA and the first-line treatment option for most cases of [sleep apnea](#).

However, it's not the only variety of positive airway pressure (PAP) therapy available.

BiPAP (*bilevel* or *biphasic positive airway pressure*) is a more tailored treatment for sleep apnea that is also available for patients who qualify.

Positive Airway Pressure (PAP) Basics

In order to understand how BiPAP is different from CPAP, it's worth reviewing the basic mechanisms of PAP therapy.

In all cases of sleep apnea (whether they are obstructive, central, or a combination of both), the body is taxed with getting enough oxygen to the bloodstream during episodes of apnea, in which pauses in breathing deplete the supply.

When enough of these pauses take place, the total amount of oxygen saturating the blood can drop to dangerous levels, creating a stress response in the body which affects many of the organs.

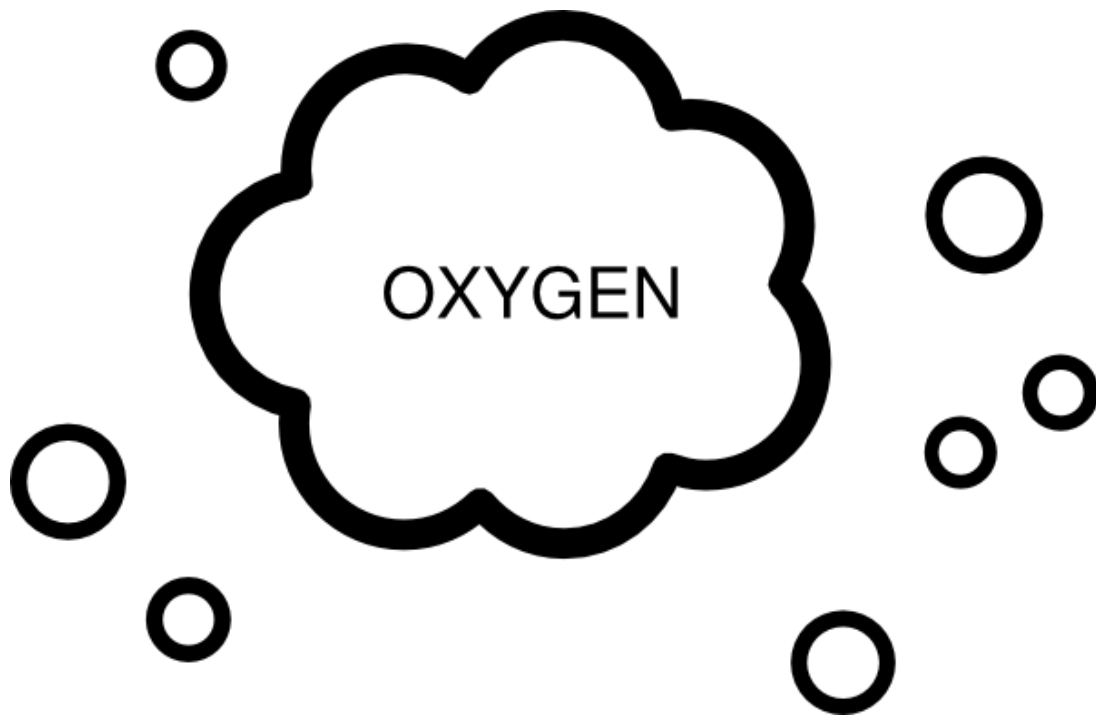
Untreated sleep apnea leads to chronic health problems as a result. This makes identifying and treating sleep apnea with PAP therapies critical to good health.

What is CPAP?

CPAP is used to treat OSA, which is a mechanical problem in which obstructions that occur in the upper airway as you sleep compromise your airflow.

Continuous positive airway pressure is delivered by way of a machine, tubing, and mask to prevent these obstructions by serving as a kind of upper airway “splint.” This air pressure essentially props open the throat to prevent partial or complete upper airway collapse.

These machines may offer a “ramp” feature which allows for a gradual increase in pressure at the beginning of the night so that the user can adjust more easily to it, but ultimately they will be using the therapy at a single pressure setting for most of the night.



When CPAP fails

While CPAP is mostly successful in treating most degrees of OSA, for some people, the continuity of delivered air pressure may be too uncomfortable for them: they may need to work harder to exhale against the incoming air pressure and, in doing so, find their sleep disrupted. Those with severe OSA typically have higher pressure requirements which make CPAP challenging to stick to.

Also, for people with [central sleep apnea \(CA\)](#), CPAP may not be as effective. Central apnea occurs when the brain forgets to signal the muscles of breathing and the diaphragm to continue assisting the lungs in breathing as you sleep. A single pressure delivery system such as CPAP may not adequately treat breathing pauses caused by misfired signals from the brain to the respiratory system.

For both of these reasons, BiPAP is frequently the next-in-line candidate for treating both OSA and CA.

What is BiPAP?

Sometimes referred to as VPAP or BPAP, the BiLevel PAP system delivers two different levels of pressurized air through the mask: one for inhalation (known as IPAP) and the other for exhalation (or, EPAP).

Generally there is a difference between these pressures, with IPAP set around 4

percent higher than EPAP. This pressure differential takes care of the problem for those with higher pressures who need a lower pressure to exhale normally and comfortably at night.

It also takes care of the challenges of people with CA because BiPAP systems are built to match or support the breathing patterns of the user so that they can breathe through potential apneas.

How BiPAP compares to CPAP

Both technologies look and sound the same. The same machine, humidification system, tubing, and mask are used to deliver the pressure, and they are cleaned and maintained in much the same way.

However, the machines themselves are adjusted to separate settings depending upon which PAP therapy they are prescribed to deliver.



Advantages to using BiPAP:

- Fewer problems with sore throat that can be characteristic of CPAP use
- The lower exhalation pressure can make this therapy far more comfortable for users requiring higher pressures to resolve their OSA
- CPAP frequently offers a comfort setting known as “C Flex” which can reduce

the exhale pressure slightly for those who need just a little bit of help; however, C Flex can vary from breath to breath, and it can only reduce exhale pressure (or EPAP) up to 3 percent, which only makes it useful for users on lower pressure settings to begin with. BiPAP is different because it delivers a steady level of pressure support during exhale that exceeds that equals or exceeds 4 percent.

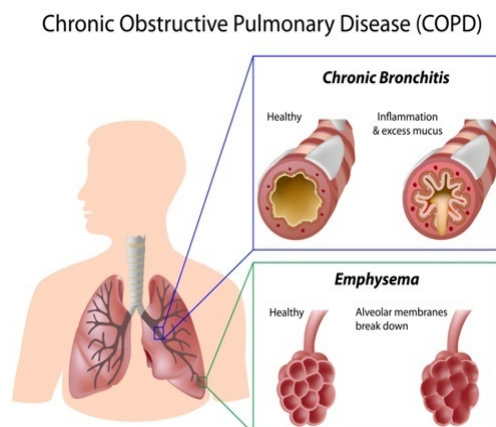
- Unlike CPAP, BiPAP can assist with actual breathing by offering advanced settings that include *spontaneous* (S), *timed* (T), or both (S/T). In “S” mode, the machine detects the user’s breathing pattern at inhalation and presets its PAP delivery mode to match the user’s pattern as it cycles back to the exhale. In “T” mode, the cycle between inhale and exhale is triggered by a preset rate called “breaths per minute” which does not wait for the user to breathe, but creates a pattern for them to adapt to. In “S/T” mode, the machine adapts to the user’s inhalation rate, but a backup rate that is preset to an ideal “breaths per minute” rate waits on deck in case the user fails to breathe on their own even with the “S” mode in place.

Disadvantages to using BiPAP:

- BiPAP is generally more expensive. This is the reason why insurance companies often want to see patients “fail” on CPAP before prescriptions for BiPAP can be assigned by their sleep physicians.

Who does best using BiPAP?

People with congestive heart failure and other serious diseases of the heart and lungs can benefit from using BiPAP. These include chronic obstructive pulmonary disease (COPD), respiratory failure due to fatigued muscles of breathing, pulmonary edema, pulmonary embolism, pneumonia, and *atelectasis* (or collapsed lobes in the lungs).



Also, people with neuromuscular problems can improve their nighttime breathing

patterns by using BiPAP.

People with high pressure settings for treating OSA may find BiPAP more comfortable to use (and easier to use on a regular basis) than CPAP.

This is no small thing: sleep apnea is a serious medical illness which requires regular, consistent therapy in order for patients to find relief. If the continuous delivery system of CPAP is at the heart of a patient's problem with PAP therapy, then a BiPAP delivery system might be just what's needed to keep them on board with their therapy.

Is BiPAP right for you?

All PAP therapies are (and must be) prescribed by sleep physicians. It is up to your sleep doctor to determine which variety of PAP therapy is best for you. Your choices may also be limited by what your insurance payer will reimburse for, and you may need to have another [attended study](#) at the sleep clinic to identify your ideal pressure needs using BiPAP.

Certain medical conditions can disqualify you for this therapy as well, including decreased consciousness (which means the user may be incapable of removing the mask independently in an emergency), excessive respiratory secretions, low blood pressure, or risk for collapsed lung caused by pressure from extra oxygen stored in the cavities around the lung (*pneumothorax*).

To find out which therapy is right for you, your best bet is to consult your sleep physician, who can review your history, diagnoses, and compliance trends to ensure you are receiving the best possible treatment for your sleep apnea.

Please reach out to us at Sound Sleep Health. We have 3 locations in the greater Seattle/Kirkland areas. Call us and Improve Your Sleep Today: (425) 296-6194.

Adaptive Servo Ventilation (ASV) and Central Sleep Apnea



We have discussed [the prevalence of obstructive sleep apnea \(OSA\)](#) frequently at this blog.

Recently we also introduced [central sleep apnea syndrome \(CSAS\)](#), a different kind of sleep apnea which occurs when the brain fails to signal to the respiratory system that it needs to continue breathing during sleep.

CSAS is not a problem of mechanics, like OSA. Instead, it is a neurological problem. It can lead to recognizable patterns of shallow breathing, or to partial or complete episodes of apnea.

Often, central sleep apnea happens as a result of other underlying health conditions (such as congestive heart failure) or [due to adverse side effects from the use of certain medications](#).

To understand how treatment for CSAS can be different than for OSA, it's important to differentiate between forms of noninvasive ventilation therapy.

A review of noninvasive ventilation therapies

For all forms of sleep apnea, treatment involves some form of noninvasive ventilation. These devices draw in air from the room, then pressurize it based on programmed settings inside the machines. The machines come in small boxes that enclose fans, motors, and humidifiers, with tubing connected to a mask to deliver the therapy. The therapies include PAP and ASV.

Positive Airway Pressure (PAP)

The machines that provide noninvasive ventilation include the different forms of positive airway pressure (PAP) therapy and adaptive servo-ventilation (ASV) therapy.

- CPAP stands for continuous positive airway pressure. It offers a single fixed pressure setting to counteract and prevent obstructive breathing patterns. It's the gold standard for treating classic OSA.
- [Automatic PAP \(or APAP\)](#) is preset to a specific minimum and maximum pressure range which is programmed to fluctuate in order to deliver the perfect pressure, breath by breath. It is also used mostly for treating OSA.
- [BiPAP](#), or bi-level positive airway pressure, works for patients with more severe OSA who must address higher pressure needs. BiPAP creates an ideal duo of pressures: one for inhalation, another for exhalation. This provides extra comfort and offers the option of presetting the breathing pattern to a timed or spontaneous backup rate. This allows a temporary increase in air pressure to smooth over any breaks.

BiPAP with backup rate is also often used as the first line of therapy for central sleep apnea. If it doesn't provide the relief and support these patients need, then ASV is introduced as a different option for noninvasive ventilation.

Adaptive Servo-Ventilation (ASV)

ASV does not appear, on the surface, to be any different than PAP. However, it's the technology behind the pressure delivery that makes it unique.

ASV is considered a “smart” device. It is programmed with algorithms which anticipate



ate and detect major changes in breathing patterns; it senses these shifts and intervenes with just enough positive airway pressure to help maintain the patient's breathing at 90 percent or better of what that patient's normal pattern resembled prior to episodes of abnormal respiration.

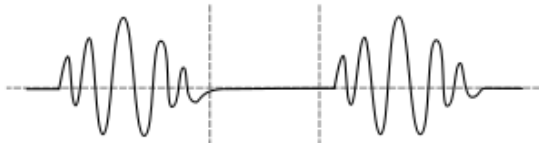
The algorithms are based off the breath-per-minute pattern of each individual patient and set to support an ideal rate. If, as the patient is using ASV, their

breathing pattern dips below this rate, the ASV kicks in and makes a temporary

pressure change to help the patient stay on a regular respiratory course.

The primary patients who qualify to use ASV:

- have CSAS that has been shown to be nonresponsive to BiPAP with backup rate
- have mixed sleep apnea (in which both CSAS and OSA coexist)
- may have developed mixed sleep apnea after beginning PAP therapy for OSA
- have a specific kind of abnormal breathing pattern called Cheynes-Stokes Respiration (CSR)



CSR is an abnormal sleep breathing pattern with a central origin. It resembles a waxing and waning wave pattern (see left), which crescendos into stretches of deep (and sometimes fast) breathing followed by patterns in decrescendo that lead to very shallow respirations and, eventually, episodes of apnea.

Because CPAP and APAP cannot be preset to accommodate such complex sleep breathing patterns, they are not typically useful to patients with central sleep apnea, mixed sleep apnea, or CSR.

How to begin a trial of ASV

Despite the machine's "smart" technology, the ASV still requires that the patient use it in a lab environment overnight. This is so that the patient's baseline breathing patterns can be established (for both minimum and maximum pressure support settings). The proper setting for oxygen support is also determined for programming into the custom calibration afterward.

Who is disqualified from using ASV?



In 2015, the [Serve-HF study](#) found that ASV was no longer a safe choice for a very specific subset of patients who suffered from chronic heart failure. These patients experience a symptom known as *left ventricular ejection fraction* (LVEF); its severity is expressed as a percentage.

Patients with chronic heart failure who have a reduced LVEF of *less than or equal to 45 percent* were at 33 percent higher risk for cardiovascular death than patients with similar symptoms who were not using ASV.

Patients who are considered candidates for ASV by sleep physicians are typically screened by cardiologists for these important factors to determine if the technology is safe for them to use. If ASV is not recommended, alternatives are best determined by the sleep physician.

Please reach out to us at Sound Sleep Health if you have concerns about sleeping problems, for yourself or for a loved one. We have 3 locations in the greater Seattle/Kirkland areas. Call us so we can work together to Improve Your Sleep Today (425) 296-6194.

5 things you need to know: Central Apnea & ASV therapy



If you've never heard of central sleep apnea and don't know what ASV is, don't worry.

Neither are common, but a lot of discussion has centered on both central sleep apnea and ASV in the last year because of safety concerns.

Check out our primer on these specialty sleep health topics.

First things first: A review

Because central sleep apnea is less common, it's always a good idea to review what it is and why ASV is still considered one of the best approaches available for treating it.

Central sleep apnea basics

Unlike the more common [obstructive sleep apnea \(OSA\)](#), central sleep apnea syndrome ([CSAS](#)) refers to sleep apnea that is the result of neurological dysfunction (as opposed to mechanical obstruction).

Essentially, central apneas occur when your brain fails to deliver signals to your diaphragm to breathe automatically as you sleep, or the signals are delivered in an erratic fashion that affects your ability to get adequate oxygen as you sleep.



Twenty percent of all cases of sleep apnea are categorized as CSAS, but 30 percent of chronic heart failure (CHF) patients develop CSAS.

CSAS is also caused by side effects from using certain medications like opioids.

Adaptive Servo-Ventilation (ASV) basics

ASV is a form of [noninvasive ventilation](#). Like continuous positive airway pressure (CPAP) therapy, it includes a bedside machine, tubing, and a mask.

However, unlike CPAP, its programming is far more complex. [ASV is said to be "smart"](#): it detects the user's breathing patterns on a breath-per-minute basis, even

when patterns are erratic, and intervenes in order to maintain breathing that is at 90 percent or better of what your normal patterns might resemble.

5 things you need to know: Central Apnea & ASV therapy

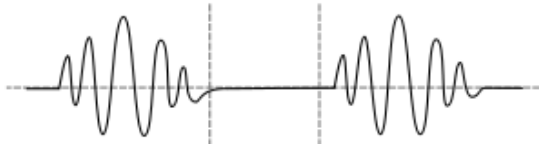
1. The best applications for ASV therapy

These days, "smart" medical devices are all the rage, and for good reason: they can be customized for specific applications in a way that offers tremendous relief for people who suffer from complicated medical conditions like CSAS.

The following situations are well suited for an application of ASV therapy:

- *Treatment-emergent CSAS, in which someone using PAP therapy develops obstructive respiratory events when they did not experience them prior*
- *Long-term opioid therapy use in people who do not suffer from alveolar hypoventilation*
- *Recovery from ischemic stroke*
- *CHF with preserved LVEF*
- *People with CSAS who did not previously respond to bi-level positive airway pressure (BiPAP) therapy with backup rate*
- *The presence of Cheynes-Stokes Respiration (CSR)*

Cheyne-Stokes Respiration (CSR)



SR) is an abnormal sleep breathing pattern with neurological origins. Its waxing and waning wave patterns crescendo into stretches of deep (and sometimes fast) breathing, to be followed by decrescendos into very shallow respirations; eventually, this pattern causes apnea.

2. Understanding the limitations of ASV in certain CHF patients



Just over a year ago, results were announced for a major study ([the Serve-HF study](#)), which examined the impact of ASV on health outcomes for people suffering from chronic heart failure. Researchers issued a caution: their findings showed ASV was no longer a safe choice for a very specific subset of CHF patients.

In patients with CHF, sleep breathing instability shifts between extremes —*hyperventilation*, in which rapid breathing results in too much oxygen in the blood, and *hypoventilation*, in which shallow, slower breathing leads to

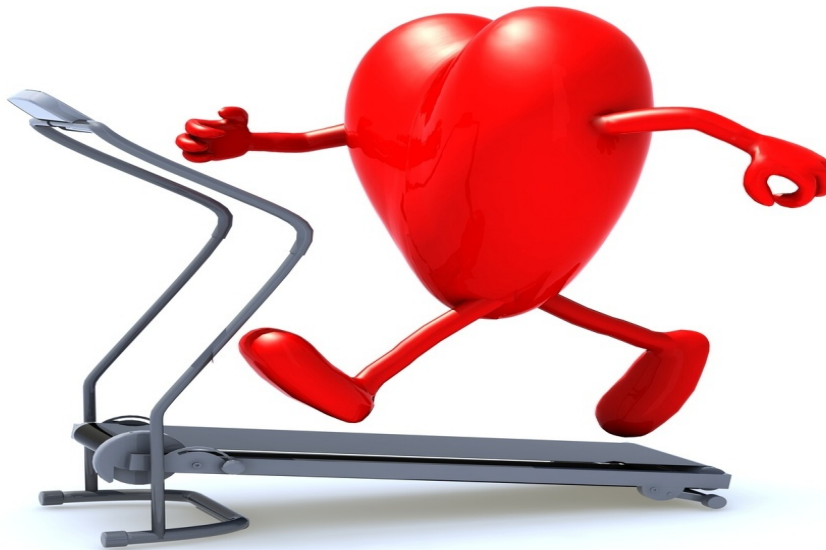
unacceptably low levels of blood oxygen.

A subset of CHF patients who struggled with ASV were identified as those with a heart failure condition known as *left ventricular ejection fraction* (LVEF). Those with reduced LVEF of *less than or equal to 45 percent* were shown to have a 33 percent higher risk for cardiovascular death than CHF patients with similar CSAS symptoms who were not using ASV.

More recently, ongoing French research (the FACE Multicentre National Cohort Study) presented additional findings on the use of ASV at a convening of the American Thoracic Society. They revealed that, while subjects with CSAS showed similar levels of heart disease severity, those with predominant CSAS *plus* higher CHF severity had more unplanned hospitalizations and a higher mortality rate *regardless of ASV usage*.

The study's lead author, Dr. Renaud Tamisier of Grenoble Alpes University, acknowledged that most CHF patients with CSAS are expected to have a poor diagnosis. However, he asked, "is this related to CHF status?... Patients with the most severe CHF do not seem to benefit from treating their with ASV."

Until these questions are conclusively addressed, all potential candidates for ASV are now screened



by cardiologists to ensure they are qualified to safely use this therapy.

3. Improving exercise capacity with ASV

A July 2016 article in the *Journal of Nuclear Cardiology* showed statistically significant and encouraging improvements to exercise capacity for ASV users.

Exercise capacity is a measurement of how well you can sustain physical activity. For people with sleep apnea (OSA or CSAS), exercise capacity has been shown to be greatly diminished by either condition.

However, by using noninvasive ventilation ([PAP therapies for OSA](#) and ASV for CSAS), you can increase your ability to endure physical exertion, which is important for addressing concerns about cardiovascular function.

4. Traveling with ASV



The bad news first: there are no portable ASV machines on the market (yet), so patients who want to travel with it will need to take their standard-sized equipment.

However, these devices have been downsized for home use, so your machine may still be easy to pack. [Because the FAA considers it a medical device, you don't have to forgo your usual carry-ons, just take it onboard with you.](#)

Backup power can come by way of backup battery power systems which are also now available for ASV, which makes it possible to go camping or "off the grid" with your therapy.

5. Trialing ASV

In order to start using ASV, you have to qualify for its use. ASV is an expensive therapy tailored to some very specific kinds of medical needs. If your particular sleep breathing disorder can be fixed by a less complicated device like CPAP or BiPAP, then it's not likely you will be granted ASV as an option.

However, if you have shown you qualify for this therapy and have failed all other therapies, your doctor may decide to pursue this option.

[Trialing ASV requires that a patient attend a sleep lab](#)



[overnight to use it under supervision.](#)

The sleep technologist will record the patient's baseline breathing patterns for both minimum and maximum pressure support settings, and an appropriate oxygen support setting will also be determined.

This data, which is different from that which may have been collected at previous PAP titrations, is crucial to programming the ASV device for the patient to use effectively at home.

If you have other questions about sleep apnea and potential therapies, don't forget that your sleep specialist is always available to answer them. Please reach out to us at Sound Sleep Health if you have concerns about sleeping problems, for yourself or for a loved one. We have 3 locations in the greater Seattle/Kirkland areas. Call us so we can work together to Improve Your Sleep Today **(425) 296-6194**.

Traveling with a CPAP Machine: Tips, Tricks, and Options



One of the key reasons why a person using CPAP may not be as compliant with their therapy is *travel*.

Whether it's for vacation, work, or other reasons, there are many who think they can just leave their CPAP machine at home for a few days because they mistakenly believe they can go without using [positive airway pressure](#) during their time away, and they dread the idea of packing and bringing their equipment with them.

However, [sleep apnea](#) occurs whether or not you use your therapy. Without CPAP, you run the risk of experiencing all the unwanted, sometimes even dangerous, affects of untreated sleep apnea that CPAP is there to mitigate.

The good news is, traveling with CPAP equipment is much easier to do than you might imagine. In some cases, you don't even need electricity in order to use your therapy.

Traveling with a CPAP Machine: Getting there

Here are some tips and tricks for packing your CPAP, getting through security lines, following airline regulations, and using your device while on board.

Packing

Keep it together. If you don't already have one, consider buying the carrying case that goes with your CPAP machine. These are designed for convenience while traveling as well as to protect your gear and keep it all in one place.

Remember, CPAP is an approved medical device. The Americans with Disabilities Act (ADA) defines CPAP machines as *medical devices*; as such, they *do not count* as carry-on items when boarding a plane, train, ferry, cruise ship, or any other form of commercial transportation where luggage must be accounted for. *You will not have to sacrifice your normal carry-on item in order to bring your CPAP.*

Prepare to board with CPAP. Most users bring their equipment onboard to protect it from damage, to ensure it doesn't get lost, and to use it on long or overnight flights.

Mark your gear and include pertinent information. When traveling with CPAP, consider marking your equipment with a medical device luggage tag. Also, stash a copy of your prescription, complete with your doctor's name and information, pressure settings, preferred mask type and size, health insurance information, and any travel letters required by your airlines or the FAA.

While on the road, you could misplace, break, or lose your CPAP machine to theft; having this information will make it easier to replace all or part of your equipment

in these situations.

Don't forget the spares. Bring extra mask cushions; you never know when they might fail.

Drain the chamber. Empty your humidifier of water before you leave for the airport, otherwise you will have to do so during security check in.

Pack water, when possible. If you will be camping, bring enough distilled or deionized water to adequately fill your humidifier.

Be hidden in plain sight. If you feel self conscious about using CPAP in public, you can look into wearing a special travel hoodie to remain inconspicuous while using your therapy. Other users find that wearing an eye mask and ear plugs or ear buds while using CPAP in transit sufficiently blocks unwanted attention from others.

Getting through security



Transportation Security Administration (TSA) agents are trained to recognize CPAP as a medical device and take special care when examining it or running it through the X-ray. What you can expect:

- *You'll need to take your machine out of its case and place it in its own screening bin like you would your laptop, leaving accessories in the case.*

Some travelers place the entire machine in a large, clear plastic bag to keep it protected from microorganisms left behind on the screening belt.

Those eligible for TSA PreCheck won't need to remove their machines from their cases.

- *Occasionally, a TSA agents may pull your CPAP machine aside to swab it; this is normal. While they are trained to use fresh gloves and sterile swabs, they get busy and may forget.*

Your medical equipment needs to be hygienic, so it's never out of line to ask for your device to be treated with utmost care. If you're concerned about its cleanliness, you may wish to wipe it down once you arrive at your destination.

Airline regulations

Most airlines have policies about using CPAP while in flight; you'll want to check with your airline carrier at least 2 weeks prior to your trip if you think you will need to use yours. This way you can be sure FAA standards are met, you'll have access to the outlets necessary to plug in, and you can take care of additional paperwork your airline may require.

You may also need to request a letter from the airline confirming your plan to use your CPAP while in flight.

While on board

Yes, it's okay to use your CPAP on planes. For transcontinental and transoceanic flights, it's an absolute necessity. However:

- *Be sure your CPAP manufacturer recommends using the humidifier while in flight. You may need to turn off this feature. The reason? Turbulence can force water into your CPAP hose which could be aspirated into the lungs.*

It is perfectly safe to use your CPAP machine without the humidifier; it will feel slightly different and may be less comfortable, but your safety is more important at this time.

- *That said, some humidification features may be okay to use while in flight. However, you won't be able to use distilled water in it unless you can find some in the concourse prior to boarding. Don't worry; you can use bottled water from the plane for temporary situations (but do avoid less hygienic tap water from airport or plane lavatories).*

Traveling with a CPAP Machine: Once you've arrived

Here are the most likely scenarios you'll face while traveling with CPAP.



Electricity available (domestic location)

In this most common situation, there are a few hazards to anticipate:

- *Sometimes, hotels and motels do not have electrical outlets close enough to the bed for plugging in your machine. Packing an extension cord (rated for the appropriate voltage) can easily fix this problem.*
- *If you are sleeping in unusual conditions (indoors or out), make sure your CPAP humidifier chamber is below the level of your head. This prevents any rare chance that water from the reservoir can enter the tubing in large quantities and be blown into the lungs. This can happen due to a tipped or falling machine or to unstable movement in the sleeping space. Tugging on the hose may also cause this to happen.*
- *Make sure your machine, tubing, and mask are placed out of reach while not in use so that they do not become damaged by curious pets or small children.*

Electricity available (foreign country)

The same hazards apply in foreign countries. In addition, you may need to make sure you pack the appropriate adapters and cables for hooking up your machine where electrical voltage is metered differently.

You are encouraged to research what kind of electrical connection you will be using. It is critical that you connect your CPAP machine to the correct voltage; otherwise, you risk damaging your machine and voiding its warranty.

Contact your DME provider if you have any questions or concerns about allocating and using the right adapters, cables, batteries, and inverters with your CPAP while out of the country.



Electricity available (but unreliable)

Sometimes you travel where inclement weather or remote surroundings can lead to problems with utility reliability. Power outages and rolling brown-outs can make using CPAP problematic.

One option is to anticipate poor access to electricity and "go unplugged" by renting or buying a back-up battery pack for your CPAP machine. A back-up battery pack ensures your machine will run regardless of access to electricity.

These packs can be expensive and mean you'll have more to pack, but for frequent travelers to remote areas or where power outages are the norm, the convenience may be worth it.

Electricity unavailable (camping)



Packing a smaller portable machine (sometimes called a "**mini CPAP**") with a battery back-up can make it much easier to remain on your therapy while camping.

Two popular portable CPAP machines used during recreational trips are the **Transcend Travel CPAP Machine** and the **Z1 Travel CPAP Machine**:

The **Transcend** operates uses a lightweight battery which lasts several nights; it includes a compact solar charger for battery recharging during the day when the machine is not in use.

The ultralight, very compact **Z1** has data recording capability, low noise, and an optional integrated battery.

If you are "car camping," you can also **power your CPAP using a long cable hooked to the standard lighter socket** found in most vehicles (not only automobiles, but

boats and RVs). You'll need to check into DC connectivity requirements and bring the appropriate cables and adapters to match the voltage of the power source most available to you. You will also need some way to charge your machine during the day when not in use.

When camping at higher altitudes: If your CPAP does not already include automatic altitude adjustment settings, have your DME provider show you how to manually adjust your settings for altitude.

Sometimes, CPAP running on batteries may not offer maximized pressure; if this is the case, **you can turn off the humidifier**, which consumes much of the energy used to power the machine.

Ambient air temperature is of special consideration when using CPAP in the outdoors. Air temperatures of less than 55°F or in very hot conditions can make using CPAP unsafe. Why? Your machine draws from the air in your sleeping space; at extreme temperatures, that air, as it enters your lungs, can bring your body core temperature too low (resulting in CPAP-related hypothermia) or too high (resulting in heat stroke).

Thousands of people travel all the time with their CPAPs

Remember, though it may seem that CPAP is inconvenient, the greater reality is that *not* using CPAP will be much more problematic. Not only are you not receiving necessary therapy, which leads to the return of the symptoms of sleep apnea, but your compliance numbers will go down and put you at risk for losing your therapy or being otherwise penalized by your insurer for not using it consistently.

At any rate, with some planning and patience, traveling with CPAP can be simplified thanks to improved technology. Today's machines default to smaller, more portable sizes; there are more and better battery back-up options than ever; and most security agents are seasoned when it comes to identifying CPAP as the medically necessary device it is, meaning fewer roadblocks for you while you're en route.

Where to buy CPAP supplies (DME, online, or retail?)



If you've just received the results of your sleep study and discovered you need [CPAP](#) (or [some other version of PAP therapy](#)) to treat your [sleep apnea](#), you may be surprised to find there are several ways to go about sourcing and purchasing your equipment and supplies.

Shopping for CPAP

To help you decide how to best prepare to shop for your equipment, you may wish to ask yourself these questions:

- *Does my insurance policy restrict my purchases in any way?*
- *Is it cheaper to pay cash up front?*
- *Would it be more practical to rent-to-own my CPAP machine?*

- *Do I need very specific features for my CPAP mask or CPAP machine?*
- *How soon do I need my equipment?*
- *Might I need a service agreement?*
- *How important is it for me to shop around?*

There are three main ways you can source and purchase your CPAP equipment and supplies: through a DME provider, an online CPAP supply store, or a large discount retailer.

Durable medical equipment (DME) providers



Many sleep centers, whether they are associated with hospitals or function independently, work with durable medical equipment (DME) providers, who stock the machines, supplies, and spare parts necessary to outfit you for PAP therapy.

These providers, commonly referred to as "DMEs," are used to working in tandem with prescribing doctors and patients' insurance companies to make the purchase and delivery of equipment painless and speedy. In addition, they are excellent service providers and can help you with questions and concerns regarding any aspect of your CPAP experience.

They know the "ins and outs" of mask fitting, PAP compliance, machine settings, and more, and they can offer useful tips and tricks to ensure you get your CPAP

therapy off to a smooth start.

DMEs may charge more for their equipment than retailers, but some patients find this added expense beneficial because of the customer service they also provide. They also stock the most popular and high-demand CPAP supplies and spares so that you don't have to wait to replace, order, or repair anything.

Online CPAP supply stores



There are a number of online retailers who specialize in sales of CPAP machines, masks, equipment, supplies, and parts. They all require a prescription in order to sell you a CPAP machine.

These shops may be a good choice for someone who has been using PAP for a while and just needs to pick up a replacement mask or filters for their machine.

One of the biggest benefits of shopping online is the huge choice of products

offered. In addition, prices can be lower and shipping can be free.

However, not all online suppliers work with insurance, which may make this purchasing route more complicated for you. They also don't offer the same quality of customer service that a DME provides, though some do have hotlines you can call to speak with a representative.

However, working with PAP can often require a more "hands on" experience with customer service. While the reps at an online store may be helpful, they may not have the extensive training in sleep technology that a DME can offer. Keep in mind, broken equipment will also require delivery for both servicing and replacement, which means potential time away from therapy that should be used daily.

Large discount retailers



Some large "big box" or discount retail chains have joined the effort to provide medical equipment to consumers.

As with online retailers, these large stores do not always work with insurance, and their provisions may be limited to items that do not require a prescription (depending upon whether they have pharmacy arrangements).

While there are dozens of options for machines and supplies, most large retailers may only stock a handful. Still, prices will be lower.

The chance you'll find a staff person knowledgeable about the intricacies of PAP therapy and CPAP masks, however, is rather slim. On the other hand, if you just need to replace some tubing or get a new chin support, and plan to pay cash, this might be the way to go.

Where NOT to buy your CPAP equipment

Let common sense be your guide. Avoid buying your personal medical products, new or used, at the following venues:

- *Garage sales, rummage sales, or swap meets*
- *Through e-commerce sites like eBay or Craigslist*
- *Anyone who is not licensed to sell medical equipment*

Not only will your purchases lack warranties or service agreements, but the actual equipment will not be customized to your specific needs. Also, needless to say, it's unsafe and unhygienic to use someone else's medical supplies. Masks, built-in filters, and CPAP tubing can collect microorganisms, machines may not have CPAP settings appropriate for your condition (which could worsen your apnea), and warranties are nullified.

This is also why you should never borrow CPAP machines or supplies from friends or family.

Many patients find the ease of working with the DME a major reason to shop for their equipment through these providers. Not only do they get their equipment quickly, but they often have good relationships with insurers, and the staff are [trained medical technicians](#) who can help with therapy challenges and provide [supplies when it's time to replenish them](#).

Meanwhile, seasoned CPAP users may find the prices at retailers lower and the

choices online broader than the scope of what a DME can offer from their warehouses. And major retailers who stock filters and other replaceables may be the most convenient option you have.

How Much Does a CPAP, APAP, BiPAP Machine Cost?



At Sound Sleep Health, we offer all the necessary equipment to start you on a new course of [PAP therapy](#), as well as accessories and [supplies for replenishment](#).

As with our [sleep testing services](#), we believe our patients deserve transparency about the costs associated with our durable medical equipment provision.

As always, remember that the cost of CPAP machines and CPAP supplies depends a great deal on your individual insurance coverage for CPAP. We encourage you to contact your insurance payer to determine just what your policy covers with regard to sleep apnea treatment.

Here's the breakdown of our pricing for PAP machines and supplies available at all of our Sound Sleep Health locations:

Sleep apnea machines

Continuous Positive Airway Pressure (CPAP) purchase - CPT #E0601 NU

Also: **Automatic Positive Airway Pressure (APAP)**

\$1350

Cash price: \$1000

Continuous Positive Airway Pressure (CPAP) rental per month - CPT #E0601 RR

Also: **Automatic Positive Airway Pressure (APAP)**

\$175/mo

Cash price: \$100/mo

BiLevel Positive Airway Pressure (BiPAP) purchase - CPT #E0470 NU

\$2600

Cash price: \$1600 (includes heated humidifier)

BiLevel Positive Airway Pressure (BiPAP) rental per month - CPT #E0470 RR

\$300/mo

Cash price: \$200/mo

Adaptive Servo Ventilation (ASV) purchase - CPT #E0471 NU

\$6200

Cash price: \$4200 (includes heated humidifier)

Adaptive Servo Ventilation (ASV) rental per month - CPT #E0471 RR

\$625/mo

Cash price: \$350/mo

Sleep apnea masks

Full face mask with headgear - CPT #A7030/A7035

\$265

Cash price: \$195

Nasal mask with headgear - CPT #A7034/A7035

\$250

Cash price: \$120

Headgear only - CPT #A7035

\$75

Cash price: \$60

Chin support - CPT #A7036

\$25

Cash price: \$25

Cushion replacement - CPT #A7032

\$80

Cash price: \$70

Nasal pillows replacement - CPT #A7033

\$35

Cash price: \$30

Sleep apnea equipment

CPAP tubing - CPT #A7037

\$50

Cash price: \$20

Heated tubing - CPT #A4604

\$70

Cash price: \$60

Disposable CPAP filters (6-month supply, 3 pks Legacy or 1 pk M series) - CPT #A7038

\$15

Cash price: \$10

Non-disposable CPAP filters (1-year supply, 1 pk Legacy or 1 pk M series) - CPT #A7039

\$20

Cash price: \$10

Heated CPAP humidifier - CPT #E0562

\$325

Cash price: \$230

Heated CPAP humidification replacement chamber - CPT #A7046

\$40

Cash price: \$40

DC/AC Adaptor - CPT #E1399AC

\$60

Cash price: \$60

C-222 lithium battery/charger - CPT #L7367/L7368

\$1000

Cash price: \$550

Note: Cash transactions of \$200 or less must be paid in full at time of service; cash transactions of more than \$200 require 50 percent deposit at time of service.

Taxes for DME sales are additional.

If you have any further questions about our prices or pay schedules, or would like to know which insurance carriers we are in network and contract with, feel free to contact us at Sound Sleep Health today at one of our three convenient locations in the Puget Sound area (Seattle, Kirkland, Northgate): **425.296.6278**

Does Insurance Pay for a CPAP Machine? (Coverage and Cost)



Just as with the costs associated with sleep studies, patients are equally concerned about the costs of buying and using [positive airway pressure \(PAP\)](#) therapies like CPAP, BiPAP, APAP, and ASV.

It may seem like there are a lot of "moving parts" in the CPAP therapy kit and each has its own lifespan for use.

Knowing ahead of time how much your health plan offers in the way of CPAP machine insurance coverage can help you make the best decisions about what to rent or buy, and [how frequently you need to replenish your supplies](#).

Insurance and CPAP

The cost of a CPAP machine depends on too many variables to be meaningful here. New CPAP machines may have multiple prices, depending upon who you buy them from, whether you use insurance coverage for CPAP, and whether your provider offers CPAP supplies through a contracted suppliers network. There really isn't a single CPAP cost breakdown.

Most private insurance policies cover PAP therapy equipment, as it is categorized as durable medical equipment (DME).



Before you make any purchases or rental agreements, you're best bet is to call your insurer to ask about coverage details.

Because you are purchasing or renting through durable medical equipment

suppliers, you may discover that your [deductibles and copays](#) for your PAP therapy may vary from your usual and customary policy payouts. You may also need to seek pre-authorization by your payer.

In addition, you are purchasing a machine, a mask, and supplies which require replenishment or replacement as they wear out. Your insurance carrier should be specific about what it will reimburse for and how frequently.

This includes claims for new and replaced CPAP tubing; [CPAP masks](#), mask parts, headgear, and chin supports; permanent and disposable CPAP filters; and CPAP humidification chambers.

Coverages for each of these separate elements of a CPAP kit may differ, depending upon your policy and whether you have secondary insurance coverage.

A word about PAP therapies: In this article, we refer to CPAP therapy, which is only one specific kind of PAP therapy. CPAP, BiPAP, APAP, and adaptive servo ventilation (ASV) represent the spectrum of DME known as noninvasive ventilation (NIV) devices. For simplicity's sake, we're referring to all PAP therapies in this article as CPAP, the most commonly prescribed PAP prescription.

Compliance



Compliance is *the* buzzword for CPAP usage for good reason: If you don't use your CPAP, you aren't going to get better.

Sleep apnea is a problem that doesn't just come and go ; like asthma, it requires a mechanical treatment to prevent it as well as to provide you with important relief from all the symptoms that come from untreated sleep apnea, such as hypertension, mood disorders, excessive daytime sleepiness, and more.

Compliance (also referred to as *adherence*) is the term doctors and insurance providers use when referring to how loyal you are in using your therapeutic device.

Minimum compliance for CPAP is defined as "at least 4 hours of use a night for at least 5 nights a week." In the long term, this is defined as 4 hours per night for at least 22 days out of a consecutive 30 days within a 90-day (3-month) period.

Why 4 hours a night? Research shows that 4 hours a night is the minimum amount of usage that can show improvements to cardiovascular health.



The "use it or lose it" dictum that comes with a CPAP prescription is no small thing. If your usage average runs below this definition of compliance, your doctor will

inquire into your struggles with using it because they are concerned about you getting better.

In addition, the Affordable Care Act now requires proof of compliance as a cost-savings measure.

Your insurance company will also be less likely to reimburse you for your equipment if you're not using it to the minimum requirement. CPAP equipment is expensive, and payers aren't interested in funding machines that are collecting dust in the closet.

In order to monitor compliance, most machines now come equipped with modems or SD cards that collect data to show proof of usage. This data is either sent wirelessly or "read" off your machine or SD card by a DME technologist.

This isn't just a feature to satisfy insurance companies; your sleep specialist wants to know you are using your machine because they have a vested interest in improvements to your health.

This is why it's critical that, once you receive your CPAP kit, you maintain regular contact with your sleep specialist and DME provider to ensure you are making the most of your therapy.

A quality sleep center will provide support and follow-up in multiple ways (email, phone calls, office visits, or support groups) to help you to solve any problems with using the mask or the machine. They are your best cheerleader for CPAP success and are skilled in troubleshooting problems and helping you overcome issues with therapy tolerance. Never hesitate to ask them for help if you feel you are struggling to make CPAP work for you.

Am I required to pay for CPAP with insurance?

Not necessarily.

Purchasing your equipment outright through an in-network DME provider allows for some discounts, which could make your insurance coverage very useful in keeping your costs down.

Your costs will vary depending upon the kind of device you need: CPAP and [APAP](#) are less expensive than [BiPAP](#) or [ASV](#), for instance, and may require pre-

authorization. But if you use insurance and go through an in-network provider, you could make out pretty well.



However, this depends entirely upon the kind of insurance you have. [As mentioned in our previous article about insurance coverage for sleep studies](#), there is the "cash pay" those who have a catastrophic plan which does not cover much of your CPAP needs, or those who don't want to use their insurance to pay for their equipment.

As with the prices of sleep study services, there is more than one price for certain kinds of equipment: the price set by the insurance company contracted with your doctor, and the doctor's cash-only price, which is always discounted. Cash payment can be a very good option for savvy patients who notice the differences between insurance pricing and self pay.

Renting versus purchasing CPAP equipment

Insurance companies frequently use a "rent-to-own" approach, which helps you by applying your monthly payments to your machine toward its purchase until you have paid it off (usually between 3 and 10 months). The rental versus purchase option is predetermined by your insurance company; therefore, you and your doctor do not have a say in this payment structure.

However, one benefit of the rental option: If you don't like your machine after a couple of months, or your doctor decides to change your prescription or give you a different kind of machine, you are not out the entire cost of a fully purchased

machine. Simply turn your current one in and get a new one.

For newer patients with complicated health concerns and who may expect to struggle with CPAP initially, this is good prevention against buying a machine outright that, two months later, might become relegated to the back of the closet.

CPAP assistance program (CAP)



The American Sleep Apnea Association hosts the [CPAP Assistance Program \(CAP\)](#) which has provided more than 4,000 CPAP equipment kits to patients in need. In order to receive a kit, you need to have a valid prescription and must fill out an application to verify need.

Kits are considered free, but the ASAA asks for \$100 payment to help them to keep the program open to all who need it. This is a significant savings over the total cost of CPAP kits even after insurance coverage. And, as one user expressed in a CPAP forum recently, "CPAP is still much cheaper than heart failure."

Because the nonprofit relies on donations of machines, masks, and supplies, they may not have specific brands to choose from, and not all kinds of therapies may be available (such as ASV or BiPAP). The kits are offered "as is" and without warranty or technical support from the manufacturer. However, they do provide a 30-day warranty to cover damages caused during shipping or due to mechanical failure.

Despite the program's limitations, it's still a great opportunity for people who need CPAP but may not be able to afford it.

Sources:

American Sleep Apnea Association

National Sleep Foundation

VeryWell.com

"How do I clean my CPAP?"

Once you start your CPAP therapy to treat your [sleep apnea](#), you may wonder how hard it is to keep



your system clean, and how frequently you need to keep it clean.

Here are some handy tips for making sure your CPAP machine and accessories are clean and well maintained.

Keeping your CPAP delivery system clean

There are some general Dos and Don'ts when it comes to cleaning your machine, mask, and accessories.

Use distilled water. Filtered or tap water **should not be used** on any part which has direct contact with your therapy; it can introduce microorganisms into your humidified pressurized air that could make you sick.



Avoid sunlight. Always make sure the machine and parts are kept out of direct sunlight, whether it's being cleaned or just hanging around on your nightstand. Direct sunlight can degrade different parts of the machine and its warmth and light can contribute to bacterial growth.

Keep your sleeping space spic and span. Dust and vacuum regularly, especially if you have pets, live where pollen is a concern, or have allergies . Also, wash your bedding frequently to cut down on the growth of dust mites.

Granted, any particulate matter will be filtered by your machine's dual filter system, but you will end up replacing your filters more frequently if you don't keep your space clean, and your machine will have to work harder to do this.

Also, the presence of more microorganisms (from dirty clothes, rooms with little air circulation, dirty coffee cups, etc.) just increases the risk for pathogens, pollutants, or tiny pests that can enter the machine and wreak havoc by way of the humidifier or the mask.



Go mild. None of the parts of your system require harsh cleaners. In fact, harsh cleaners will greatly *reduce* the lifespan of your equipment and increase your risk for illness. Mild, fragrance-free dish detergent should take care of most tasks. A vinegar-water solution (1:3) is safe for disinfecting.

Remember, use distilled water for the parts that come into contact with your therapy (the humidification chamber, interior filter, tubing, and mask cushion).

Here are some specific tips for keeping your entire PAP system clean:

Cleaning: CPAP machine

It's pretty simple, really, as these machines are more or less self-contained. Use mild detergent and a damp cloth to wipe the surface of the machine, then dry it thoroughly with a lint-free towel.

Never submerge the machine in water. It encases an electrical motor which can be damaged if it comes into contact with water; these can nullify your warranty. None of the parts inside the machine actually come into contact with the parts that deliver air pressure to you directly, so there's no need to worry about cleaning the inside.

Cleaning: CPAP mask

This component must be cleaned daily. A mask that is cleaned improperly or irregularly will break down faster, which can lead to leaks, the biggest threat to therapy success.

In addition, a leaking mask can irritate your skin or your eyes as well as breed bacteria.

Wash your face



Makeup and lotions can break down the integrity of the silicone products used in the manufacture of these masks.

To get the longest wear out of your mask, wash and dry your face before use and do not apply anything to your skin.

CPAP headgear and chin supports

These should be washed once a week in warm water and mild detergent, rinsed in warm water, then air dried in a space that is as free of dust and other particulate matter as you can find. Hanging them somewhere helps. **Never put headgear or chin supports in a washing machine or dryer.**

Mask interface and frame

The interface (or cushion) is the part of the mask that actually touches your face. It should be washed daily in mild, fragrance-free soap and warm water, then rinsed well in warm water and air dried. Be careful handling the cushion, as it can tear if you stretch it. A weekly soak in 1 part vinegar to 3 parts water for 20 minutes, followed by a rinse in distilled water, disinfects it nicely.

The frame of the mask (the sturdy plastic or soft fabric part) should be cleaned weekly in warm soapy water.

Cleaning: CPAP tubing

As with all the other parts, use



g mild soap and warm water to clean out the tubing should do the trick. You don't have to wash your tubing daily, but a couple of times a week is recommended. Hang it to dry for best results.

If you have concerns about bacteria growth, a basic vinegar-water solution will kill any pathogens and does not leave a scent.

Avoid using scented products or bleach. Tubing material breaks down rapidly and these products can introduce unhealthy vapors into your pressurized air. Be prepared to [replace your tubing annually](#) (this is called *replenishment*) as it can

become leaky due to normal wear and tear, usually due to microscopic holes that can develop.

If you have children or pets, please keep your tubing out of their reach, as they can unintentionally damage the hose materials while playing with it, or introduce bacteria that you could inhale later.

Cleaning: CPAP humidifier

If you can remove your humidifier, it's recommended that you do so when you go to fill it up to avoid spilling into the machine itself. If you can't remove the humidifier, pour your distilled water into the humidifier facing the bottle *away* from the machine so that any spillage will run to the outside.



You must refill your humidification chamber daily. **Distilled water is the only kind of water you should use in your humidifier, whether it's for humidifying or for cleaning.** Also, **never reuse the water**, as it can breed microorganisms that could make you sick.

Since you're washing your mask cushion daily anyway, you may as well wash your humidification chamber, using mild soap and warm water and air drying it after rinsing it clean.

A weekly 20-minute soak in a vinegar-water solution (1 part vinegar: 3 parts water) can help cut down on any residues that might build up inside the chamber; these can come from particles that evaded the filtration system.

Cleaning: CPAP filters

You have two filters in your machine. One is built inside the actual machine, and it's usually a charcoal color. The other is a replaceable white filter.

The permanent filter is made up of a spongy foam material that can be removed to be washed. Cleaning it once weekly can *greatly* extend the life of your machine. As with all the other parts, a mild soap solution in warm water, a warm rinse, and air drying takes care of it.

The disposable white filters aren't meant to be cleaned, but replaced every couple of months. You'll know it's time to swap a dirty one out for a clean one when it is no longer bright white.

CPAP cleaning



convenience

Though all of these directions are easy for most people to manage, sometimes life gets busy and schedules fill up. There are a few products that can help you keep your CPAP system clean, disinfected, and maintained more conveniently:

So Clean CPAP Cleaner & Sanitizer

This gadget automatically cleans and sanitizes your mask, hose, and humidification chamber without need to disassemble your setup. It doesn't require water or chemicals, but uses activated oxygen (O₃) to sanitize your equipment.

CPAP mask wipes

These disposable towelettes can be used to wipe down masks, tubing, and other components of your system. They are no substitute for daily cleaning and disinfecting, but they can help save time in the morning if you are traveling or otherwise away from home.

CPAP belongs to the world of durable medical equipment (DME), and it is meant to be used in a way that is effective and safe. Keeping your CPAP machine, mask, and accessories clean is the easiest way to extend the life of all the parts in your system, saving you money and greatly reducing your risk for problems with bacteria or leaks.

If you have concerns about cleaning or maintaining your CPAP, never hesitate to call your sleep center for advice and tips. Sometimes a sleep specialist can even set up automatic email reminders for you to help keep you on track.

Need Help with CPAP?

Please reach out to us with any questions or needs that you might have. Heck, just click the link below to request a free 10 minute phone consultation with one of our sleep experts...no obligation! What have you got to lose but another night sleep!

[Request Your Free Phone Consultation](#)