

Portable Oxygen Concentrators

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What you need to know, before you go.

With the introduction of Portable Oxygen Concentrators (POC) many of the barriers for a traveling oxygen patient have been reduced. The POCs are both a blessing and a challenge as they provide beneficial features for oxygen delivery, yet they operate differently than other portable oxygen systems. The traveler, provider and clinician all need to be part of the pre trip planning process to insure consistent oxygenation for the patient at all activity levels while away from their home oxygen system.

Portable oxygen concentrators are different than traditional portable systems. Traditional portable systems store oxygen as either a gas or a liquid. These systems run out of oxygen at a specific time based on the flow rate, or if using a conserving device, based on dose setting and respiratory rate. POCs manufacturer oxygen with the use of a power source, so as long as there is power, a specific amount of oxygen is available from individual POCs based on the devices design for oxygen production. This is where it is important to understand the capabilities of a POC prior to selecting a brand. They all manufacturer and dose oxygen differently and as they say in the auto industry “your mileage may vary.”

All consumers want the lightest weight, longest lasting product while traveling. Personal computer and cell phones are examples of the advancements in technology that have improved capabilities when traveling. Portable oxygen concentrators have shrunk to below ten pounds, yet with the reduction in size has come reduction in oxygen production capability. All concentrators use a sieve material that traps nitrogen and produces 90% + oxygen. Based on the amount of sieve used in the design of the concentrator, a specific amount of oxygen is produced per minute. This oxygen is then metered through an oxygen conserving device to provide a dose of oxygen to the patient with each breath. The dose size is different on each POC and the numbers on the dial does not equate to a continuous flow setting and are not the same for different POCs. If the patient begins to breathe faster while using a POC, the dose volume or oxygen purity will drop. This is caused by the POC only having a specific amount of oxygen production capability based on the amount of sieve. The

lightest POC have the least amount of sieve, the largest POC has the most amount of sieve. This is one of the main factors for the amount of oxygen available to the patient.

Patients have discovered that they are able to do more activities with different oxygen delivery systems and different POCs. Many times the capabilities of an oxygen patient are determined by the capabilities of their oxygen system. The capabilities of an oxygen system are determined by its design. The home oxygen market has been driven by the patients request for light weight long lasting portable oxygen equipment. Manufacturers have responded with very small portable oxygen systems; the tradeoff has been very low dosing oxygen systems. Patient's oxygen needs vary with activity and some patients need little supplemental oxygen at rest, yet more oxygen with activity or travel to altitude. The goal of long term oxygen therapy is to maintain adequate oxygen saturation at all activity levels. To accomplish the goal the oxygen system needs to have the capabilities to provide enough oxygen at all activity levels.

This is where the patient needs to gain the advice of a knowledgeable clinician that understands the capabilities of a specific POC and have that clinician titrate the patient at the activity levels they will be using the POC. Unfortunately, there seems to be a disconnect between the availability of a knowledgeable clinician or the patients lack of understanding of the variability of POCs. Patients have become the researchers of new POC systems and are learning the differences in products through trial and error. This is a sad situation, yet most payers of home health care see oxygen products as commodities and most patients being bed bound and not needing options for their lifestyle needs. A good use of the appropriate POCs would be to travel to Washington DC to enlighten the ill-informed politicians.

Oxygen travelers can help clinicians and providers in determining their oxygen needs and become more informed of the issues related to different oxygen systems. The traveler will need to explain the details of their travel plans and allow the provider/clinician to explain options and issues to be aware of.

Suggestions:

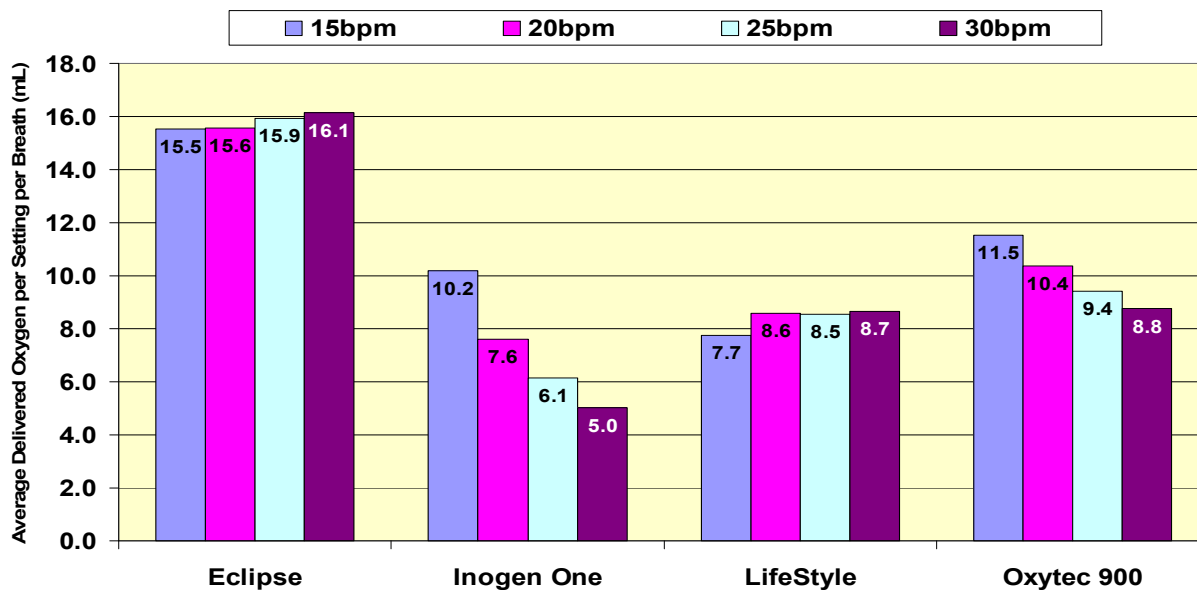
Is the oxygen patient able to exercise with their current portable oxygen system without desaturation? Has a clinician tested the patient at activity to know this answer? Does the patient have an exercise prescription for activity? Has the patient participated in a pulmonary rehabilitation program?

Does the patient own an oximeter. This would be helpful after an appropriate POC is selected to allow for the monitoring of oxygen saturation and adjusting the POC to maintain oxygenation. The physician should be aware of the patient plans to titrate their own oxygen.

Is the POC the only oxygen system the patient will have on the trip? If yes and the POC only has an OCD delivery method, the patient should be assessed for sleeping with a POC. Most of these devices have very sensitive triggering for the OCD, yet if device does not sense a breath, the patient will not receive oxygen.

The battery life is determined by the manufacturer specifications and the patient dose setting and respiratory rate. For air travel, the patient will need to determine the length of the flight, their dose setting and respiratory rate and bring enough batteries to last the entire flight. A margin of error needs to be factored into the calculations as increased respiratory rates could occur with trips to the bathroom, flight delays with crowded airports (bad weather, de icing etc>) and dose changes based on oximeter readings. New rules are coming forward regarding the number of lithium batteries that can be carried on or packed so the airline should be contacted prior to air travel for updates on the new rule.

Traveling is a pleasure we all enjoy and the oxygen dependent patient that takes a trip after being prescribed oxygen will realize that there is life after a 24 hour oxygen prescription. At this time, traveling with oxygen is a little challenging, yet with the help of a professional respiratory therapist, a knowledgeable oxygen provider and a supportive travel industry, the oxygen patient can enjoy the great American past time of being a tourist. As Willie Nelson sings you “can’t wait to get on the road again!”



This graphic demonstrates the variability of different POCs to deliver a consistent oxygen dose with different breathing rates (BPM). The higher dose systems weigh more and have more sieve available to produce oxygen.