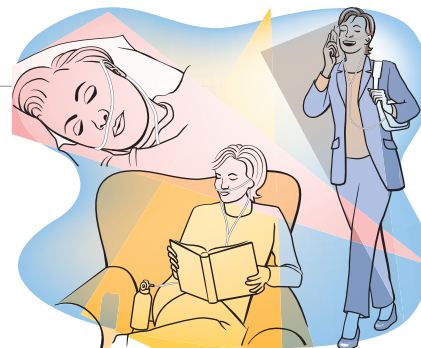


Oxygen Therapy

Some adults and children may need extra (supplemental) oxygen. While lung disease is the usual cause for needing supplemental oxygen, other diseases, such as heart disease, may require treatment with oxygen.



Why do I need oxygen?

We need oxygen for the cells in our body to work. The air we breathe contains about 21% oxygen, which is plenty for people with healthy lungs and many with lung disease. However, if you have bad enough lung disease, you may not be able to get enough oxygen from your lungs into your blood. Hence, if your oxygen level is low, your healthcare provider will recommend supplemental oxygen. Sometimes you only need extra oxygen in special situations. For example, you may need oxygen at very high altitudes (like in the mountains or in an airplane) even if you do not at sea level.

How do I know I need oxygen?

Most people do not know when they need oxygen. Your health care provider will use special equipment to check the amount of oxygen in your blood. Your oxygen level is measured with either a blood sample or an *oximeter*. A blood sample is drawn from an artery (usually in your wrist) for an *arterial blood gas* (ABG) measurement. The ABG measures your oxygen level directly from your blood and is the most accurate of the tests. This can be done in the office, clinic or hospital, wherever the arterial blood test equipment is available. A *pulse oximeter* (<http://www.thoracic.org/patients/patient-resources/resources/pulse-oximetry.pdf>) can estimate your oxygen level by measuring your oxygen saturation (O₂ sat). The pulse oximeter is clipped on a finger, toe or earlobe and has the advantage of not requiring any needles. It can also monitor your oxygen during sleep or with walking. However, the pulse oximeter does not provide as much information as an ABG. It also can give a false reading if your circulation is poor, you are wearing dark nail polish, or if you are anemic.

How much oxygen should I use?

Oxygen is a medication and requires a prescription from your healthcare provider. They will prescribe your oxygen at a specific flow rate and a specific number of hours per day. If your oxygen level is lower during activity than at rest, you may have one flow rate prescribed for rest and a higher flow rate prescribed during activity. It is very important that you use your oxygen as prescribed. Using too little oxygen may put a strain on your heart and brain, causing heart failure, fatigue or memory loss. Using too much oxygen can also be a problem. For some

patients, using too much oxygen can actually cause them to slow their breathing to dangerously low levels.

Will I need oxygen when I sleep?

Usually if you use supplemental oxygen during the day, you will need to use supplemental oxygen at night. This is because you tend to slow your breathing rate while sleeping. Some people may not require oxygen while awake but may need supplemental oxygen while sleeping. Your healthcare provider will determine if you need extra oxygen and how much you should take when sleeping.

How do I know if I need more oxygen when I exert myself?

You use more energy during exertion and therefore, need more oxygen than at rest. With lung disease, even breathing faster or deeper may not be enough to get oxygen into your blood. Your healthcare provider may therefore have you do an *exercise stress test* or a *walk test* to find out if your oxygen levels change with walking. In children, the amount of oxygen they need can be determined by measuring their oxygen level during play and with feedings.

How many hours a day will I need oxygen?

You should ideally use supplemental oxygen for 24 hours a day, unless your health care provider tells you you only need to use oxygen for exercise or sleep. Even if you feel "fine" off of your oxygen, your body's oxygen level may be low and can cause brain and heart problems.

Will I always need to use oxygen?

Sometimes you may only need supplemental oxygen during or after a short illness, for example, around the time of a hospitalization. If your lung disease improves, oxygen therapy may be able to be reduced or stopped. However, you should never stop or cut back your oxygen without having your oxygen level checked and instructed by your healthcare provider.

What are the different kinds of oxygen systems?

Oxygen can be delivered from three types of systems: oxygen concentrator, liquid system or oxygen pressurized in a metal cylinder. The right choice for you depends on how much oxygen you need (your flow rate) and when you need it (day, night or both). The choice of delivery system also depends on where you live, your electrical supply, how active you are, cost to you and insurance restrictions.

What are oxygen concentrators?

An oxygen concentrator is a device that takes in the oxygen we normally breathe (that consists of 21% oxygen), removes other gases from the air and delivers 85-95% pure oxygen. The concentrator runs on electricity or a battery. A concentrator for home usually weigh from 30-50 lbs (14-23 kg) and is usually on wheels so that it can be moved from room to room.

Portable oxygen concentrators weigh from 3-20 pounds, depending on the battery weight and thus, are more convenient to use. However, portable concentrators may deliver a lower percentage of pure oxygen than a larger home concentrator. Also, some portable devices deliver a “pulse” of oxygen rather than a continuous flow. Before purchasing or renting a portable oxygen concentrator, ask your healthcare provider to measure your oxygen level while using the portable concentrator while you are at rest and while being active, to make sure that the system can deliver enough oxygen for you.

What is liquid oxygen?

Liquid oxygen is made by super-cooling (-300 degrees) oxygen. When in liquid form, oxygen takes up less space, so one can store a large amount in the home in thermos-like storage canisters. Liquid systems deliver 100% oxygen, and do not require electricity. A small canister can be filled from the large one for portability. This small canister weighs about 11 pounds and can be carried or placed in a cart.

What are oxygen cylinders?

Oxygen is compressed under high pressure into a metal cylinder and is stored in either large or small cylinders. This is the oldest method for storing oxygen. Cylinders contain 100% oxygen. Large cylinders are not portable and often used as the primary source of oxygen in the home. However, using a large tank in your home can require frequent replacement and can be expensive. You may be able to use an oxygen concentrator instead as the primary oxygen supply source. Smaller cylinders are used as portable oxygen when leaving the house. They can serve as a backup during a power outage or equipment issue.

What is a nasal cannula?

A nasal cannula is a two-pronged tube that is placed in your nose for delivering oxygen. The other end of the tube is attached to your oxygen system. A nasal cannula has the ability to deliver high amounts of oxygen. However, high-flow oxygen (greater than 4 liters/minute) delivered by a nasal cannula can dry your nasal passages. This drying can sometimes be reduced with a humidifying device to warm and moisten the oxygen.

What is a pulse (on-demand) device?

A pulse oxygen delivery device delivers oxygen only when you breathe in. As you breathe in, the device senses the start of your inhalation and immediately gives a short “pulse” of oxygen. It can help you preserve the same amount of oxygen over a longer time. Young children and adults who are weak or do not inhale strongly may not trigger the sensor when they inhale, and hence, will not get enough oxygen. Such people should not use a pulse (on-demand) device. Oxygen concentrators, liquid oxygen systems and small cylinders all have the ability to provide ‘pulsed’ oxygen. You should confirm with your healthcare provider that you are getting enough oxygen through a pulse device before buying or renting it.

Do I have to worry about oxygen exploding or burning?

Oxygen alone will not “explode” and does not burn. Oxygen will make a flame burn hotter and brighter. You should never smoke while using oxygen. Your nose, hair, and clothing can catch fire very quickly and cause life-threatening burns. Keep oxygen at least 6 feet (2 meters) away from any open flame. If a cylinder falls and cracks, it propels like a torpedo. Stabilize all cylinders by placing in a safe area or by securing them to a wall.

What do I need to do when I travel?

Talk with your healthcare provider to see if you will need oxygen on an airplane. If so, contact the airline customer service department to find out their rules for using POCs and oxygen. You may be required to select a window seat, and you will need to have enough battery power for your POC during the flight. You should also contact your medical supply company for POC rentals and help with travel needs throughout the trip, including to the airport, while waiting at the airport, during stopovers, and at your travel destination.

Authors: Suzanne C. Lareau RN, MS, Bonnie Fahy RN, MN

Reviewers: Hrishikesh S Kulkarni, MD, Marianna M Sockrider MD, DrPH, Jennifer Hayes (degree), Trina Limberg (degree)

Rx Action Steps

- ✓ Use your oxygen as prescribed by your healthcare provider.
- ✓ Discuss with your healthcare provider what options you have for oxygen delivery systems and which works best for your activity level.
- ✓ Have your oxygen level checked at rest and with activity when using your oxygen delivery system.
- ✓ Do not smoke, especially around any oxygen devices.
- ✓ Avoid being around open flames and people who smoke when using oxygen.
- ✓ If you are traveling, plan ahead to ensure you have enough oxygen at every step of your trip.

Healthcare Provider’s Contact Number:

Additional Resources

American Thoracic Society

- <https://www.thoracic.org/patients>

American Lung Association

- <https://www.lung.org/lung-health-diseases/lung-procedures-and-tests/oxygen-therapy>

COPD Foundation

- <http://www.copdfoundation.org>

Pulmonary Fibrosis Foundation

- <https://www.pulmonaryfibrosis.org/life-with-pf/oxygen-therapy>

TSA

- <https://www.tsa.gov/travel/security-screening/whatcanibring/items/medically-necessary-personal-oxygen>

about Travel—Senior Travel

- <http://seniortravel.about.com/od/airtravel/a/PortableOxygen.htm>

No Person Left Behind

- <http://oxygen.nopersonleftbehind.org>

This information is a public service of the American Thoracic Society. The content is for educational purposes only. It should not be used as a substitute for the medical advice of one’s health care provider.

