

OXYGEN AND ASSISTED VENTILATION



INTERNATIONAL COPD COALITION POCKET GUIDE FOR COPD PATIENTS 2011

Introduction

This booklet aims to answer common questions that patients and their family members and caregivers have about oxygen therapy and assisted ventilation. There is not room to cover all aspects of COPD and its treatment here, but you can find out more by talking to your doctor or through the links provided at the back of this book.

This booklet was written with contributions from expert panel members Antonio Anzueto, Nicholas Hart, Rupert Jones, Sunny Kaul, Youssef Mohammad, and Peter Wijkstra. We wish to thank the International COPD Coalition (ICC) member organizations who suggested what COPD patients really want to learn about COPD, about oxygen, and assisted ventilation.

What is COPD?

COPD is a chronic lung disease that causes symptoms including shortness of breath. COPD is mainly caused by cigarette smoking. Dusts and chemicals encountered on the job and air pollution also cause COPD.

COPD can occur at any age, but is most common in people over age 40. A person over age 40 who has shortness of breath, chronic cough with phlegm, and a history of exposure to causes of the disease may have COPD. A breathing test called spirometry is used to find out whether a person has COPD.

There is no cure for COPD, but treatments are available that can improve COPD patients' quality of life and help them get around and lead a more normal life. Long-term oxygen therapy is one treatment that can help many patients with advanced COPD. Assisted ventilation, also called noninvasive ventilation, is another therapy for COPD. It is primarily used during periods when a person's breathing gets worse, called exacerbations.



Treatment for life. Oxygen therapy is a treatment for people who have advanced COPD and low blood oxygen levels. There is no shame in using oxygen. You are taking constructive action to enhance your quality of life and your ability to participate in daily activities with your loved ones.

What is the purpose of oxygen therapy?

Patients with advanced COPD often need long-term oxygen therapy (LTOT). Oxygen therapy works by increasing the amount of oxygen carried in your blood and delivered to your tissues. This helps to keep your vital organs healthy, especially your heart and brain.

Some people find that oxygen therapy also decreases their feeling of being short of breath, but this is not the main reason for oxygen therapy. There are other COPD treatments like bronchodilators that are especially designed to help you feel less short of breath.

Scientific studies have shown that when used correctly according to a doctor's instructions, oxygen therapy improves patients' lives and increases their life expectancy.

There is no shame in using oxygen. You are taking constructive action to enhance your quality of life and your ability to participate in daily activities.

How will I know if I need oxygen therapy?

Oxygen therapy is a treatment for people who have advanced COPD and low blood oxygen levels even when their disease is stable, a condition called chronic hypoxia.

To determine whether you need oxygen therapy, your doctor will need to check your blood oxygen level. The first test is usually done with a simple pulse oximeter that clips on your finger (see picture). If this shows low blood oxygen, then you will need arterial blood gas measurement, a blood test. Usually this measurement is made twice, a few weeks apart, to see if your oxygen levels are consistently low over time.



Pulse oximetry. A simple device that clips on your finger measures your blood oxygen level, helps determine if you need oxygen therapy, and can enable you to monitor your blood oxygen during oxygen therapy.

Your doctor may also arrange additional tests to help make a decision about oxygen therapy. Your doctor may want to find out if you have certain complications of COPD that indicate your body is not receiving enough oxygen. Two common tests are an electrocardiogram and an echocardiogram. These tests check for pulmonary hypertension, which means your heart has to work harder to pump blood to your lungs. Another common test is a red blood cell count to check for polycythemia, an increased level of red cells in your blood.

After initiating oxygen therapy, your doctor will want to review your progress after about three months. This is to ensure that you are receiving the correct amount of oxygen therapy. You should not change or stop your oxygen therapy unless your doctor tells you to.

What kind of oxygen therapy is best for me?

Your doctor will give you a prescription for oxygen therapy that includes four pieces of information: the duration, source, method of delivery, and flow rate. Your doctor will help you to find the combination that works best for you.

Duration: The benefits of oxygen therapy depend on using it for at least 15 hours a day. Discuss with your doctor how to plan a schedule that works for you. Many people use oxygen continuously for 8 to 9 hours at night, and additional periods during the day to reach the total of 15 hours.

Source: Oxygen comes in three primary forms: as compressed gas in a cylinder, as a liquid, or from an oxygen concentrator (see pictures below). Each form has its own benefits and challenges. Again, your doctor can help you find an option that works for you.



Oxygen options. Oxygen comes in three primary forms: from an oxygen concentrator (pictured on the left), as compressed gas in a cylinder (right picture), or as a liquid.

Devices for oxygen therapy require regular attention. Gas cylinders and liquid tanks will need to be refilled periodically, typically once or a few times per month, by a trained home care provider. Oxygen concentrators need regular maintenance.

Many patients use two different oxygen sources: a stationary unit for the home, and a portable unit that permits exercise and participation in activities outside the home. Be sure you know how long your portable oxygen device can be used before it needs to be refilled (in the case of devices that use oxygen liquid or gas) or its batteries recharged (portable concentrators).

Method of delivery: Different delivery systems can be used to breathe oxygen:

- Nasal prongs, or cannulae, are most commonly used. These are often preferred by patients because they do not interfere with eating, drinking, or talking (see picture below left).
- Face masks (simple face masks or Venturi masks) that go over the nose and mouth can also be used (see picture below right).



Oxygen delivery. Many patients prefer using a nasal cannulae to receive oxygen, as they do not interfere with eating, drinking, or talking. Other patients use a mask that goes over the nose and mouth.

Flow rate: Oxygen flow rate, or liters of oxygen per minute (L/min), can be adjusted depending on the individual patient's needs, the oxygen source, and the method of delivery. When you begin oxygen therapy, your doctor will monitor your blood oxygen level to determine the proper flow rate for you.

You will also need to adjust the flow of oxygen depending on your activity level. Your doctor will tell you the flow rate to use at rest, during exercise, and during sleep. You can also use a pulse oximeter to monitor your blood oxygen level on your own.

What about short-term oxygen during exercise?

Some people with COPD have oxygen levels that are normal at rest but fall when they walk. These patients do not need long-term oxygen therapy, but may be helped by oxygen when they walk or exercise. To determine whether you are among this group, your doctor will assess your level of breathlessness and your blood oxygen level during physical activity. If short-term oxygen is determined to help you, you will be prescribed a lightweight, mobile oxygen source that you can use while exercising or walking.

What kind of activities can I do when I'm on oxygen therapy?

Some patients believe that they are restricted in their activities if they use oxygen. This is not true—in fact, oxygen therapy is designed to help you be more active and able to participate in daily life. Portable oxygen devices are available to increase mobility for people who use oxygen (see *picture below*). Following your doctor's instructions, you can exercise and go out with family and friends while on long-term oxygen therapy.



Out and about. Oxygen therapy is designed to help you be more active and able to participate in daily life. Portable oxygen devices, such as small oxygen canisters (above left) and wheeled carts (above right) are available to increase mobility for people who use oxygen.

Can I travel by airplane while on oxygen therapy?

Air travel for holidays is possible, but it must be carefully planned. You will need to find out your individual airline's requirements and make arrangements for using and bringing oxygen onto the plane. Sometimes airlines provide gas cylinders, but

certain portable oxygen concentrators have been approved for use while flying. Insurance and airline regulations can affect your cost and ability to fly. Your doctor should be consulted to make sure you are “fit to fly,” and will tell you how to adjust the oxygen flow rate while in the air to maintain the level of oxygen in your blood.

Since the oxygen concentration in air decreases with increasing altitude, you must also be cautious about visiting places in the mountains or at high altitude when you have advanced COPD. Your health care team can help you determine what altitude is safe for you.

Are there dangers I need to be aware of with oxygen therapy?

The risk of fire increases as the oxygen level in the air rises, so cigarette smoking and being around open fires are hazards when you are on oxygen therapy. Sometimes people trip and fall over oxygen tubing or electrical cords, so you should take care to arrange these cords out of the way as much as possible.

For certain patients with COPD, the wrong amount of oxygen therapy can slow your breathing and lead to high blood carbon dioxide levels, resulting in confusion, headache, and drowsiness. Your doctor will supervise proper oxygen delivery and monitoring in order to prevent this problem. If you develop any of these symptoms, let your doctor know immediately. It is important not to increase the prescribed oxygen flow rate without consulting your doctor.

How is oxygen used during and after exacerbations?

Patients with moderate and severe COPD can have periods of worsening symptoms especially when they have a cold or lung infection. If you have a COPD exacerbation you may need oxygen therapy either at home or in the hospital. After hospitalization for a COPD exacerbation, many patients will continue to need long-term oxygen therapy. If you are discharged from the hospital on oxygen, your doctor will need to review your oxygen prescription and monitor your progress over several weeks as you continue to improve. You may be able to stop oxygen therapy after you recover fully, but some patients will continue to need it.

How can I prevent exacerbations?

It is very important that you take all your medications according to your doctor's instructions. Make sure you understand how to use your inhaler.

Many COPD exacerbations are caused by respiratory infections, so getting a pneumococcal vaccine and yearly flu vaccinations can help prevent exacerbations. Wash your hands frequently, use hand sanitizer, and practice good hygiene to reduce your chance of catching a respiratory infection.

Cigarette smoking substantially increases the chance of getting an exacerbation, so if you do smoke, get help to quit. In addition, reduce your exposure to air pollution by staying away from secondhand smoke, and staying indoors with the windows closed on bad air pollution days. Also avoid indoor irritants like using harsh detergents, cooking in confined kitchens, and open fires.

Finally, keep your body strong. Walk, exercise regularly, eat healthy foods, and work to reach and maintain a healthy weight.

What is assisted ventilation?

Assisted ventilation (also known as noninvasive or facemask ventilation) is a way of helping you breathe using a snug-fitting mask that you wear over your nose and mouth. This facemask is attached to a machine, called the ventilator, by a length of tubing and provides a flow of air that helps to inflate and expand your lungs (see *pictures below*).

Assisted ventilation is often used to help hospitalized COPD patients with exacerbations who have difficulty breathing. If your lungs cannot bring enough oxygen into the body and get rid of carbon dioxide, the ventilator helps by breathing air into your lungs. This way you do not have to work so hard to breathe. Your lungs will expel the air by themselves.

Assisted ventilation is not the same as needing a breathing tube—in fact, noninvasive ventilation can reduce your chances of needing a breathing tube during an exacerbation.



A helping breath. Assisted ventilation is a way of helping you breathe using a snug-fitting mask that you wear over your nose and mouth. This treatment is often used to help hospitalized COPD patients with exacerbations who have difficulty breathing.

Will I need assisted ventilation over the long term?

Some of patients who receive assisted ventilation during an exacerbation still benefit from this treatment after they have been discharged from the hospital. Usually, it is used at night while the patient is sleeping.

Experts are studying the long-term use of assisted ventilation in other COPD patient groups, and practicing physicians are looking forward to seeing the results of these studies to see if their patients can benefit from this new approach.

