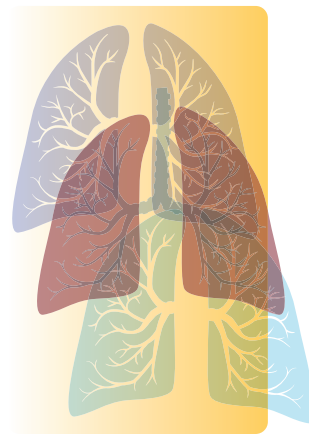


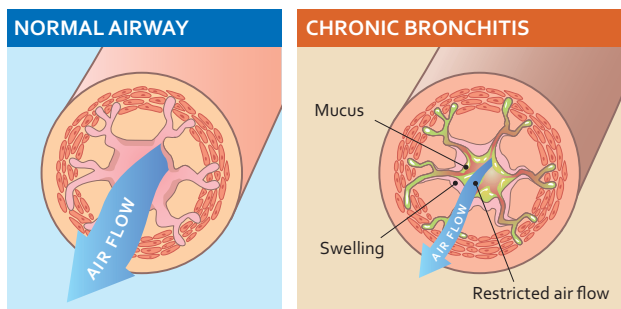
# Chronic Obstructive Pulmonary Disease (COPD)

Chronic Obstructive Pulmonary Disease (COPD) is a preventable and treatable lung disease. People with COPD must work harder to breathe, which can lead to shortness of breath and/or feeling tired. Early in the disease, people with COPD may feel short of breath when they exercise. As the disease progresses, it can be hard to breathe out (exhale) or even breathe in (inhale). A person with COPD may have chronic bronchitis (bron-ki-tis), emphysema, or a combination of both conditions. The amount of each of these conditions differs from person to person. Asthma is another disease that causes narrowing of the airways, making it hard to breathe at times, but asthma is not included in the definition of COPD. Some people do have a mix of both COPD and asthma.



## What is chronic bronchitis?

Obstructive bronchiolitis is a condition in which chronic inflammation and swelling cause the inside of the breathing tubes (airways) to be smaller than normal. This narrowing interferes with how well and how easily air empties out of the lungs (expiration).

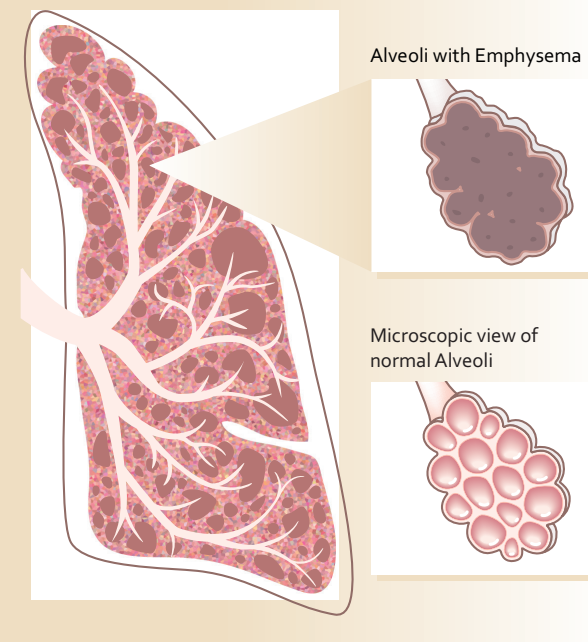


## What is emphysema?

The lungs are made up of more than 300 million tiny air sacs called alveoli. These air sacs are normally stretchy and springy. When you breathe in, the air sacs expand like tiny balloons. Breathing out usually is passive (takes no effort) as the alveoli “spring” back to their original size. In emphysema, the walls of the air sacs (alveoli) of the lung are damaged and lose their stretchiness. As a result, they do not empty easily. Emphysema can also contribute to narrowing of the airways.

The combination of non-stretchy alveoli due to emphysema and narrowed airways due to both chronic bronchitis and emphysema, prevents the lungs from emptying normally. This causes air to become trapped in the lungs. “Air trapping” or the inability to fully exhale, leads to abnormal expansion or hyperinflation (hyperinflation) of the lungs. Constantly having trapped air in the lungs combined with the extra effort needed to breathe results in a person feeling short of breath.

## EMPHYSEMA



## What causes COPD?

Although the most common cause of COPD is tobacco smoke, there are several other factors that can cause or make COPD worse, including environmental exposures and genetic (inherited) risk. For example, heavy exposure to certain dusts at work, chemicals, and indoor or outdoor air pollution (including wood smoke or biomass fuels) can contribute to COPD. Some people have none of these exposures and still get COPD. We don't fully understand why some smokers never develop COPD and some

never smokers get COPD; but, hereditary (genetic) factors probably play a role in who develops COPD.

#### How do I know if I have COPD?

Common symptoms of COPD include feeling short of breath while resting or when doing physical activity, cough, wheezing, fatigue, and/or mucus production that does not go away. If you have these symptoms, you should talk to your healthcare provider. Some people with early COPD may not be aware of symptoms. Testing should be done in people who are at risk for COPD. Your healthcare provider may have you do a breathing test (lung function test) called spirometry. Spirometry measures your ability to exhale and can detect whether your airways are narrowed. (See ATS Patient Information Series fact sheets on Pulmonary Function Testing).

#### How does a healthcare provider know a person has COPD?

Healthcare providers diagnose COPD based upon the combination of symptoms and test results. The single most important test to determine if a person has COPD is spirometry. Changes of COPD can also be seen on a chest x-ray or a chest CT scan. Once your healthcare provider has determined that you have COPD, he or she may order other tests to assess how well you are breathing with sleep and with exercise. This includes looking at your oxygen saturation levels.

#### How is COPD treated?

The first and most important treatment of COPD in smokers is to stop smoking. Medications and other therapies are available to help treat nicotine addiction and to help you stop smoking. For more help on stopping smoking, see the ATS Patient Information Series fact sheets on Tobacco.

Medications can also be prescribed to help relieve symptoms of COPD and to prevent symptom flares (called exacerbations) that can lead to further loss of lung function. Some general classes of medications include those that aim to widen the airways (bronchodilators), reduce swelling in the airways (anti-inflammatory drugs, such as steroids), and/or treat infections (antibiotics). Other than antibiotics, most COPD medications should be taken every day, usually for life. Stay as healthy as possible. Avoid contact with those who are sick, wash hands often, get a yearly flu vaccine, and get pneumonia and COVID-19 vaccines when recommended by your healthcare provider.

In some people, COPD can also cause the oxygen level in the blood to be low. If this occurs, a person can be given supplemental oxygen. Breathlessness should not be confused with low oxygen levels. People with COPD can experience shortness of breath or have a hard time breathing even if they have good oxygen levels. Therefore, breathlessness is not always a good guide for whether you need to use oxygen (See ATS Patient Information Series fact sheet on Breathlessness).

Proper nutrition and staying in good physical shape are also important not just for symptom relief but also for your quality of life. Pulmonary rehabilitation programs offer supervised exercise and education for those with breathing problems and should be a part of a comprehensive treatment plan for anyone with COPD. Community support groups can provide education and opportunities for COPD patients and their caregivers to share their experience with other people with COPD and families.

(See ATS Patient Information Series fact sheet on Pulmonary Rehabilitation).

In some cases, surgical procedures such as lung volume reduction surgery or lung transplantation may be options to consider (See ATS Patient Information Series fact sheets on Surgery for COPD and Lung Transplantation).

#### Will COPD ever go away?

The term chronic, in chronic obstructive pulmonary disease, means that it lasts for a long time. Symptoms of COPD sometimes improve when a person stops smoking, takes medication regularly, and/or attends pulmonary rehabilitation. However, the lungs are still damaged and can never fully return to normal. Therefore, COPD is a lifelong condition. Breathlessness and fatigue may never go away entirely, but people can learn to manage their condition and continue to lead a fulfilling life.

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## Rx Action Steps

Stop smoking and avoid smoke exposure.

- ✓ See your healthcare provider for any unexplained chronic cough or shortness of breath.
- ✓ Ask your healthcare provider about having a spirometry lung function test to check your lungs.

**Healthcare Provider's Contact Number:**

## Resources

### American Thoracic Society

- [www.thoracic.org/patients](http://www.thoracic.org/patients)
- [www.livebetter.org](http://www.livebetter.org) (Live Better with Pulmonary Rehab)
- Fact sheets on: breathlessness, influenza, oxygen therapy, pulmonary function tests, pulmonary rehabilitation, pulse oximetry, surgery, tobacco, transplantation, COVID-19 vaccines.

### COPD Foundation

- <http://www.copdfoundation.org/What-is-COPD/Understanding-COPD/What-is-COPD.aspx>

### National Heart Lung & Blood Institute

- <http://www.nhlbi.nih.gov/health/health-topics/topics/copd/>

### American Lung Association

- <http://www.lung.org/lung-disease/copd/about-copd/understanding-copd.html>

### The Pulmonary Education and Research Foundation: PERF

- <https://perf2ndwind.org/>

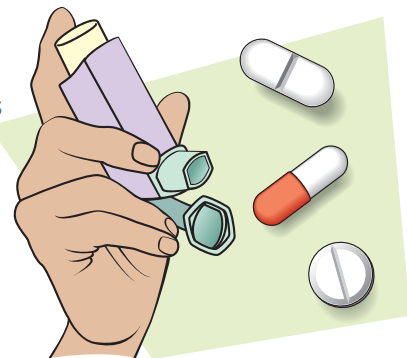
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## Medicines for COPD

Chronic obstructive pulmonary disease (COPD) is a chronic disease of the lungs that damages both the airways and the lung tissue, making it difficult to breathe. A person with COPD may have chronic bronchitis (bron-ki-tis), emphysema, or a combination of both conditions.

People with COPD often use several kinds of medicines to help control symptoms. While there is no cure, medicines can help improve your quality of life. This fact sheet explains different types of medicines used for COPD. For more information on COPD, see the ATS Patient Information Series at [www.thoracic.org/patients](http://www.thoracic.org/patients).



### BRONCHODILATORS

Bronchodilators are medications that relax the muscles that wrap around your breathing tubes (airways), allowing the tubes to become larger and easier to breathe through. Each bronchodilator is different, based on its: 1) chemical make-up, 2) how fast it works, and 3) how long it lasts. Your healthcare provider will decide with you which of these medications or combinations work best for you.

#### Types of bronchodilators:

- beta2-agonists
- anticholinergics
- theophyllines

#### Beta2-Agonists

Inhaled beta2-agonists can be fast-acting (start to work within 3 to 5 minutes) or slow-acting (take 20 minutes to work). Fast-acting beta2-agonists are known as rescue or reliever medicines because they bring quick relief for breathlessness, but do not last long enough to provide 24-hour relief. Using your reliever medication before an activity that you know makes your breathing worse (such as exercise, showering, or going out into the cold air) may help lessen or prevent your breathing difficulty.

Inhaled beta2-agonists are short-lasting (last 4 to 6 hours) or long-lasting (last 12 to 24 hours). Examples of short-lasting beta2-agonists are albuterol, levalbuterol, pirbuterol, salbutamol, and terbutaline. Examples of long-lasting beta2-agonists are salmeterol, formoterol, indacaterol, and vilanterol. Long-lasting beta2-agonists are taken every 12 to 24 hours, providing more convenient treatment of COPD than short-acting drugs that are usually used as “rescue medications” to relieve sudden onset of shortness of breath.

Albuterol and terbutaline are also available in a pill form, but the pill forms can cause more side effects than the inhaled form and take longer to start working so their use has been discouraged.

#### Common side effects when taking beta2-agonists

Beta2-agonists are generally safe medications when inhaled but can cause a fast heartbeat, tremors (shakiness), and rarely cramping of the hands, legs, and feet, particularly if they are used too often or too many puffs are inhaled at once. These medications may also keep you awake at night. The combination of a fast heartbeat and shakiness can cause feelings of anxiety and worsen breathlessness.

These side effects often last for only a few minutes after taking the medicine and may totally go away after a few days of regular use. If the side effects do not go away, talk to your healthcare provider. You may need to try a lower dose, change to another type or brand of beta2-agonist, or stop the beta2-agonist. If you have difficulty going to sleep after taking your beta2-agonist, take it an hour or two before bedtime.

#### Anticholinergics

Anticholinergic bronchodilators are also inhaled medicines. They have a slower onset of action than beta2-agonists and, therefore, they should never be used for quick relief. Anticholinergics can be short- or long-lasting. The short-lasting form (ipratropium) works in about 15 minutes, lasts for 6–8 hours, and is usually taken up to 4 times a day. The long-lasting forms take about 20 minutes to begin working and lasts for 12 hours (aclidinium) or 24 hours (tiotropium, umeclidinium).

#### Common side effects when taking anticholinergics

Anticholinergic bronchodilators do not have as many possible side effects as beta2-agonists. The most common side effects are dry mouth and rarely, difficulty passing urine (urinary retention).

#### Why am I taking two inhaled bronchodilators if they both do the same thing?

It may be confusing to understand why you are taking two different bronchodilators. Research studies have shown that combinations of two bronchodilators work better than either alone. A common combination is to give a long-acting beta2-agonist and a long acting anticholinergic.

#### Theophylline

Theophylline is a bronchodilator that is not commonly used for COPD in the U.S. since most people can use inhaled bronchodilators. It is usually taken by mouth as a pill. A blood test must be done to monitor your theophylline level to make sure the drug level is high enough to be effective, but not high enough to cause serious side effects. The amount of theophylline that you take needs careful supervision since your theophylline blood level can change when you start a new medicine, stop smoking, or change your diet. A common side effect is shakiness, but very serious side effects include severe nausea, vomiting, heart beat irregularities, and seizures. If you experience any of these, get medical care right away immediately.

## STEROIDS

Steroids, also known as corticosteroids, are medications used to reduce swelling in the breathing tubes. These drugs are not the same as anabolic steroids (misused by athletes) to build muscles.

Steroids are usually taken by inhaler, often in combination with a bronchodilator. They do not work quickly and may take a week or more before you notice the benefits. If you have an exacerbation or worsening of your COPD symptoms, steroids may be given by mouth in a pill form because pills can act faster (within 24 hours) and provide a higher dose of steroids than the inhaled forms. Using oral steroids for a long period of time (chronically) is discouraged due to significant side effects.

### Common side effects when taking steroid medications

Side effects depend upon the dose, length of use, and whether taken by pill or inhaled form.

The most common side effects of inhaled steroids are a sore throat, hoarse voice, and infections in the throat and mouth. Things you can do to avoid or reduce these side effects include:

- Rinsing your mouth and gargling after taking an inhaled steroid
- Using a spacer/holding chamber to reduce the amount of steroid landing in your mouth and throat

People with COPD who use inhaled steroids, especially those with severe disease and who at an advanced age, may have a higher risk of pneumonia.

Taking steroids by pill, either in high doses or low doses for a long time, may cause problems including bruising of the skin, weight gain, weakening of the skin and bones (osteoporosis), cataracts, high blood pressure, increased blood sugar, mood changes, muscle weakness, and swelling of the ankles or feet. Many but not all of these side effects may improve or go away when the oral steroid is stopped.

While many of these unwanted effects can be troublesome, not taking steroids when they are needed can lead to severe, life-threatening breathing problems. You should discuss any concerns about taking steroids with your healthcare provider.

## OTHER MEDICATIONS

For people who have frequent COPD exacerbations despite being on bronchodilators and inhaled steroids, two medications are sometimes used—roflumilast and long-term use of the antibiotic, azithromycin. Both are taken by mouth as pills and have been shown to decrease the number of exacerbations you have. However, both can have side effects, so it is important to discuss the risks and benefits with your healthcare provider.

In addition, other antibiotics are used if a bacterial infection is suspected to cause a COPD exacerbation. Mucolytic medications may be used as-needed to thin mucus (phlegm or sputum) making it easier to cough up. Some people need to use oxygen to treat low oxygen levels (See ATS Patient Information Series fact sheet on Oxygen Therapy).

### What is the Difference Between a Generic and Brand Name Medicine?

Most medicines have two names, a generic and a brand name. The generic name describes the main chemical in the drug. The brand name is decided by the maker (or makers) of the medicine. If several companies make the same generic drug, then the drug may be known by several brand names. Names may vary by country. Usually there is no major difference between brands of the same medicine in how it works. Your healthcare provider can tell you if there are any important differences to know in choosing a brand of medicine.

### Delivery Devices for Inhaled Medicines

Bronchodilators and steroids are usually taken by inhaling the medicine. Some of these inhaled medicines are available in a dry powder form as well as liquid spray (mist). There are different designs for inhalers depending on the form and drug. Two or three medications may be combined into a single inhaler. If you do not use your inhalers correctly, you may not get the full dose of the medicine. You can inhale some medicines better by using the metered dose inhaler with a spacer (holding chamber). A spacer is a tube that attaches to the inhaler device to hold a dose and give you more time to breathe it in deeply. Bring your inhalers and spacer to your healthcare provider visit and review your medicines and how you use them with him or her. The clinic staff (nurses or respiratory therapists) may also be helpful in showing you how to take an inhaled medication.

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## Rx Action Steps

Know the names of your medicines and what they are supposed to do and not do.

- ✓ Review how you take your medicines with your healthcare provider.
- ✓ Tell your healthcare provider everything you are taking (including medicines for other conditions, over-the-counter medicines, herbs, medicines from relatives, etc).
- ✓ Overuse of any medicine can result in a higher risk of side effects.
- ✓ Call your healthcare provider promptly if you have any serious side effects.

**Healthcare Provider's Contact Number:**

### Additional Information:

#### American Thoracic Society (ATS)

<http://www.thoracic.org>

- COPD
- COPD Exacerbations
- Quick Relief Bronchodilators
- MDI Inhalers
- Oxygen Therapy

#### COPD Foundation

<https://www.copdfoundation.org/>

- Guides for Better Living  
<http://copdf.co/guides>
- COPD Pocket Consultant Guide App  
<https://copdf.co/pcg-download>  
<http://copdf.co/education-materials>

#### American Lung Association

<https://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/>

#### Patient Education & Research Foundation

<https://perf2ndwind.org/>

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## Exacerbation of COPD

An exacerbation (ex-zass-er-bay-shun) of Chronic Obstructive Pulmonary Disease (COPD) is a worsening or “flare up” of your COPD symptoms. In many cases an exacerbation is caused by an infection in the lungs, but in some cases, the cause is never known. The inflammation (irritation and swelling) in the lungs during and after an exacerbation can cause some people to be extremely ill and it often takes a month or longer to recover completely.

Figure 1-Normal

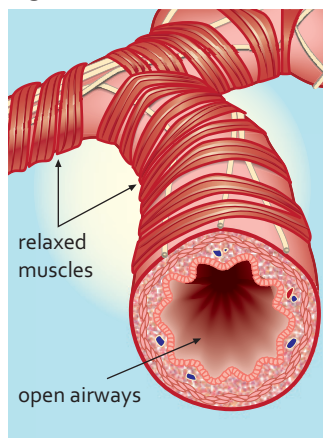
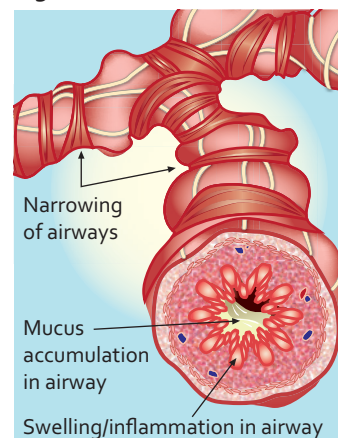


Figure 2-Exacerbation



Knowing the signs and symptoms of an exacerbation will help you to get treatment early, shorten the length of the exacerbation, and hopefully prevent the exacerbation from becoming severe.

### What causes an exacerbation?

The most common cause of an exacerbation is infection in the lungs or airways (breathing tubes). This infection is often from a virus, but it may also be caused by bacteria or less common types of organisms. Exacerbations can also occur from inhaling irritating substances from the environment like air pollution, or from severe allergies. The lungs react to infection or irritating substances by developing inflammation that makes the airways narrow from muscle tightness, swelling, and mucus (see Figure 2). These changes in the airways cause the increased signs and symptoms. This fact sheet will discuss exacerbations of COPD. For more about COPD see other *ATS Patient Information Series* pieces at [www.thoracic.org/patients](http://www.thoracic.org/patients).

### What are the signs and symptoms of an exacerbation?

Exacerbations can come on very quickly (hours to days). They involve worsening of your usual signs and symptoms of COPD:

- You may notice that you become more breathless than usual with routine activities, like walking to the car or showering.
- Your typical cough may increase in severity or frequency, or a new cough may develop.
- You may notice a change in the **color** of your sputum (mucus) from clear to colored (deep yellow, green, or brown) and/or the **amount** of sputum that you bring up may increase. In many people, a change in sputum is the first sign that they have an exacerbation.

- You may feel more tired (fatigue).
- If you find that you have more trouble sleeping than usual, develop a headache when you wake up, or feel confused (or a family member notices you are confused and/or have difficulty waking you up), you may be having signs of high carbon dioxide levels that need immediate medical attention.
- If you measure your oxygen level regularly by using a pulse oximeter, you may also notice that your oxygen levels are lower than usual.

You can also have other signs and symptoms of infections in the lung, such as fever. You should report the signs and symptoms you notice to your healthcare provider to figure out if you are having an exacerbation and how it should be treated.

If you have had an exacerbation of your COPD in the past, you should take note of the “pattern” of your symptoms. Everyone has slightly different signs and symptoms from an exacerbation. In particular, notice the color and amount of sputum you bring up every day when you are not ill so that you recognize your signs and symptoms of an exacerbation.

### How is an exacerbation diagnosed?

Diagnosis of an exacerbation is based upon a history of worsened signs (such as your oxygen levels being lower than normal for you) and symptoms and physical exam findings by a doctor or nurse, such as new or increased , feeling like you cannot get a big enough breath, or wheezing, feeling like you cannot get a big enough breath, or rapid shallow breathing. There are no tests of the blood, sputum, or chest x-rays that have been found to diagnose an exacerbation. Thus, the best person to help identify an exacerbation early is **you**. Knowing the signs and symptoms of an exacerbation and getting help early, are the very best ways to

limit it from becoming very severe.

### How is an exacerbation treated?

Some exacerbations can be treated at home with inhalers, steroids, and/or antibiotics. However, if your symptoms become severe, you will need to be hospitalized. Treatment of an exacerbation is primarily with medications to control the swelling and constriction (tightness) in your airways. The airway swelling is treated with steroid pills or IV (intravenous) steroids. Airway constriction is treated with bronchodilators by inhaler or nebulizer. In most cases, you will also be prescribed an antibiotic to treat bacterial infection.

The main function of your lungs is to supply oxygen to the body and rid the body of carbon dioxide. Exacerbations can interfere with this, so you may need to have extra oxygen. You may need support from a PAP (positive airway pressure) machine with a nose or facemask to help you breathe better. If your exacerbation is severe, you may need treatment in an intensive care unit (ICU) and require a mechanical ventilator (a machine to breathe for you).

### How serious is an exacerbation?

Exacerbations can be very serious and can lead to death. Getting help early is therefore very important. If you have been told that you have severe COPD or have had exacerbations before, discuss with your healthcare provider what steps to take and how to contact them (or their team) for advice and assistance if your symptoms get worse. This is known as an *Action Plan*, and is described below. It is difficult to know who will get an exacerbation; however, if you have had one in the past, you have a greater chance of having another. For this reason, your healthcare provider may speak to you about advanced care planning. Talk with your healthcare provider and your family about your treatment wishes if you become too sick to speak for yourself. For example, if you cannot breathe well enough on your own, do you want to receive support from a mechanical ventilator to give your lungs time to recover? You can decide to forego or limit aggressive treatments (such as a mechanical ventilator) if you do not want them. You may be referred to a palliative care specialist who can work with you to help you breathe more comfortably and address any pain or distress you may be having. For more about palliative care see the *ATS Patient Information Fact Sheet*.

### What is an Action Plan?

An *Action Plan* is a set of instructions or steps you should take at the first sign of an exacerbation. For example, you will likely be told to take your short acting bronchodilator (often called a "rescue inhaler"), such as albuterol, every four hours. You may also be told to call your healthcare provider, or to fill a prescription and start taking steroid pills and/or an antibiotic. These instructions may tell you when to go to the emergency department. It is very important to note that every person is different and needs a plan that meets his or her needs. Your *Action Plan* should be created along with your healthcare provide, kept in a prominent place in your home, and reviewed with your healthcare provider regularly.

### Can I prevent having an exacerbation?

Not all exacerbations can be prevented, but there are ways to try to decrease how often you have them or limit how severe they become.

- If you smoke, get help to quit.
- Avoid being around others with colds or the flu
- Use good handwashing to help avoid infection.
- Get the flu vaccine (shot) every year. The flu shot has been shown to help prevent exacerbations.

Several types of medications have also been shown to decrease your chance of having an exacerbation. You may already be taking these to treat your COPD. Talk to your healthcare provider about how you are managing your COPD and how you can avoid exacerbations.

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## Rx Action Steps

- ✓ Watch for signs and symptoms of a COPD exacerbation. Call your healthcare provider promptly if you are starting to have symptoms.
- ✓ Take your medicines for COPD as prescribed and talk to your healthcare provider if you have any concerns about your treatment.
- ✓ Get a flu vaccine yearly. Avoid tobacco smoke, and quit if you are a smoker.

### Healthcare Provider's Contact Number:

## Resources

### American Thoracic Society

- [http://www.thoracic.org/patients/Patient Information Series Pieces:](http://www.thoracic.org/patients/Patient%20Information%20Series%20Pieces)
- What is COPD
- COPD Medicines
- Surgery for COPD
- Signs & Symptoms
- Breathlessness
- CPAP & PAP Troubleshooting
- Mechanical Ventilation
- Palliative Care
- Tobacco Series
- Influenza

### ATS Pulmonary Rehabilitation Website:

- <http://livebetter.org> (Live Better with Pulmonary Rehab)

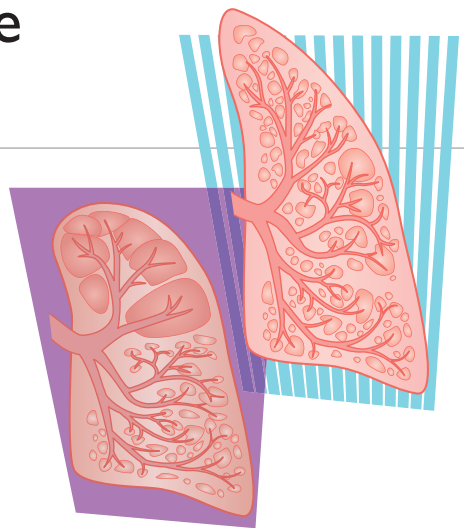
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# Surgery for Chronic Obstructive Pulmonary Disease

If you have COPD, you may benefit from lung surgery. Only a small number of people however, have the type of COPD that will benefit from surgery. The major types of surgery for COPD are bullectomy, lung volume reduction (LVRS) and lung transplantation.

If you have COPD and require surgery for other reasons, you should speak with your healthcare provider before having any operation.



## What is a bullectomy?

Emphysema (not chronic bronchitis) causes air sacs to become over inflated. When air sacs get extremely large, they are called bullae (bull-eye). These extra-large air sacs are pressing on healthier lung, preventing the healthier air sacs from working properly. Bullectomy is a surgical procedure that can remove giant bullae which occupy greater than one third of the right or left chest. Very few people have these giant bullae. Most people with COPD from emphysema have many small areas of damaged air sacs in their lungs. These small damaged air sacs are often scattered throughout both lungs and therefore would not benefit from a bullectomy.

## What is lung volume reduction surgery (LVRS)?

Some patients with emphysema have greater air sac damage in the upper portions of both lungs and healthier air sacs in the bottom portions. In these patients Lung volume reduction surgery (LVRS) can remove the upper portion of both lungs. Like a bullectomy, LVRS involves removing non-working air sacs. However, unlike the bullectomy, LVRS sometimes removes some good air sacs as well. After taking out this mostly non-working part of

the lung, you may breathe better. Because LVRS is a major surgery, you must have a strong heart and healthy remaining lungs after the surgery to make the risk of having the surgery worthwhile. You must also show that you are willing to keep physically fit by stopping smoking and completing a pulmonary rehabilitation program (See ATS Patient Information Series fact sheet on Pulmonary Rehabilitation) before having LVRS.

## What is Endobronchial Valve Volume Reduction?

Recently, endobronchial (N-doe-bronk-E-ul) valves have become available to help with breathlessness for some patients with severe emphysema. Usually three to five tiny valves are placed in the airways to collapse non-working portions of lung in a similar way as LVRS but without major surgery. This therapy is currently available at specialized medical centers where expertise is available to select appropriate candidates based on advanced testing including specific lung function testing and lung scans.

## What about lung transplantation?

Lung transplantation replaces one or both of your lungs with a lung or lungs from an organ donor. The best COPD candidates for lung

transplantation have no other major health problems, and have such severe lung disease that the benefits of surgery outweigh the risks. Most patients with COPD are not good candidates for a lung transplant because of the risk of serious complications. Generally patients over age 70 are not candidates for lung transplantation because of poorer outcomes (See ATS Patient Information Series fact sheets on Lung Transplantation and Candidate Selection).

### What if I need general surgery for some other condition?

Like anyone else, the more health problems you have, the greater the risk of complications during or after surgery. When you have COPD, your chances of complications from surgery are increased. Before having any surgery, discuss with your healthcare provider the type of surgery you are having, the possible risks, and what you need to do to lessen your chances of having problems after the surgery.

### Are there tests or treatments I should have before any general surgery?

Before surgery, it is important that your healthcare provider knows the condition of your lungs. One or more breathing tests may be ordered to test your lungs (See ATS Patient Information Series fact sheet on Pulmonary Function Tests). Before the surgery you may be given additional medicines such as steroids or antibiotics. Your healthcare provider may also contact your surgeon to discuss your surgery. Besides knowing the condition of your lungs, your healthcare team will want to be sure that you are in good physical shape before surgery. They may suggest that you enter a pulmonary rehabilitation program (See ATS Patient Information Series fact sheet on Pulmonary Rehabilitation). If a pulmonary rehabilitation program is not available, you should begin an exercise program of your own to build up your strength. Walking is a very good form of exercise. For a directory of pulmonary rehabilitation programs in the US, see [www.livebetter.org](http://www.livebetter.org). If you smoke, you must stop at least 4 weeks before surgery, and then hopefully for good. For help quitting smoking go to [www.thoracic.org/patients](http://www.thoracic.org/patients).

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## Rx Action Steps

- ✓ Surgery (bullectomy, LVRS, and lung transplant) is not the best treatment option for most patients with COPD. Most people receive medical treatment for COPD.
- ✓ Be in the best physical shape possible before any surgery.
- ✓ If you smoke, stop smoking at least 4 weeks before having any type of surgery.
- ✓ Let your healthcare provider and surgeon know you are having surgery so they can help you be sure your COPD and any other health problems are under good control.
- ✓ If you can, enroll in a pulmonary rehabilitation program. If a program is not available, begin a walking program you can do on your own.

**Healthcare Provider's Contact Number:**

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### Resources:

**American Thoracic Society (ATS)**

<http://www.thoracic.org>

- Pulmonary Rehabilitation
- Transplantation

<http://www.livebetter.org>

**American Lung Association**

<http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/diagnosing-and-treating/surgery.html>

**American College of Chest Physicians**

<http://www.chestnet.org/Foundation/Patient-Education-Resources/COPD>

**National Emphysema Treatment Trial (NETT)**

<http://www.nhlbi.nih.gov/health-pro/resources/lung/national-emphysema-treatment-trial>

**COPD Foundation**

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

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