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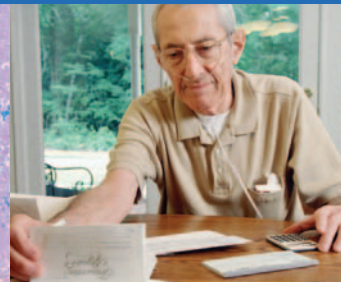
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# Living Well With COPD: Chronic Bronchitis and Emphysema

Patient Education Guide



AMERICAN  
COLLEGE  
OF CHEST  
PHYSICIANS  
AND  
THE CHEST  
FOUNDATION

# Living Well With COPD

## Patient Education Guide

The American College of Chest Physicians is the leading resource for the improvement of cardiopulmonary health and critical care worldwide. Its mission is to promote the prevention and treatment of diseases of the chest through leadership, education, research, and communication.

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Additional copies of this Patient Education Guide, Product Code 5032, may be purchased from the American College of Chest Physicians.



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# Living Well With COPD

For most people, living with chronic obstructive pulmonary disease (COPD) is not easy. It's a serious illness that can greatly affect your entire way of life. But, it doesn't have to mean the end of enjoying your life. Together with your doctor, you can learn ways to improve your breathing and fitness and prevent acute worsening of your disease. It takes a commitment to improve your health, and it takes effort to use your medicines and therapies correctly. You **can** live well with COPD. **It's up to YOU to take control.**



## What Is COPD?

### COPD is Chronic Bronchitis and Emphysema

Chronic obstructive pulmonary disease (COPD) is a common lung disease, affecting 16 million Americans, and the number is growing. COPD causes 13.4 million doctors' office visits and 634,000 hospitalizations each year. Long-term cigarette smoking causes nearly all cases of COPD. It takes many years for COPD to develop before people need medical help. Most people begin to feel the disease symptoms between 50 and 70 years of age.



# Inside Your Lungs

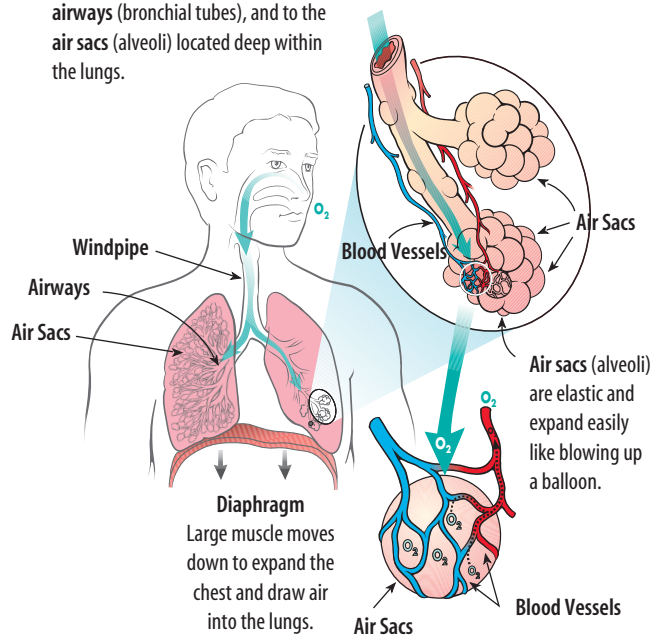
Understanding how your lungs work will help you understand more about COPD.

## Inhale

## Exhale

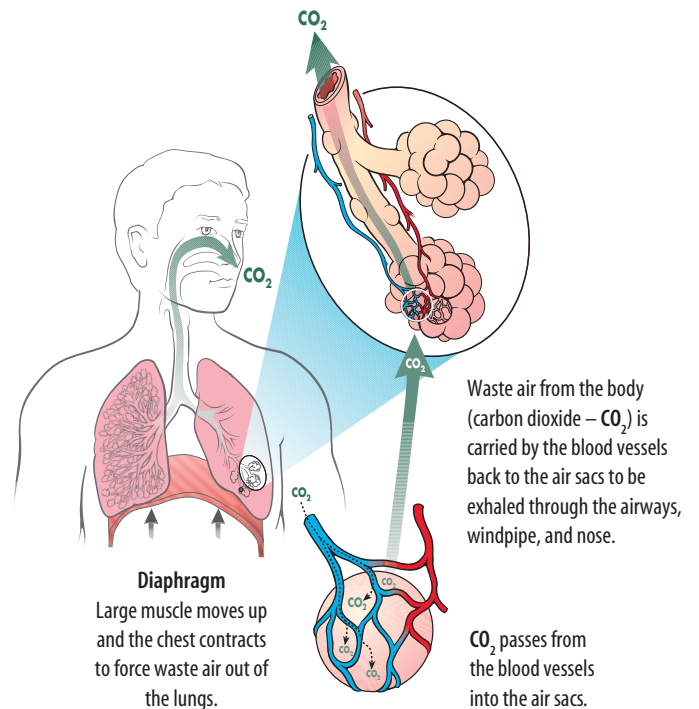
### Healthy Lungs – Breathing in

In a healthy lung, air flows freely into the **windpipe** (trachea), through the **airways** (bronchial tubes), and to the **air sacs** (alveoli) located deep within the lungs.



Oxygen ( $O_2$ ) from the air passes through the air sacs and into the **blood vessels**. The blood then carries the oxygen to all parts of the body.

### Healthy Lungs – Breathing out



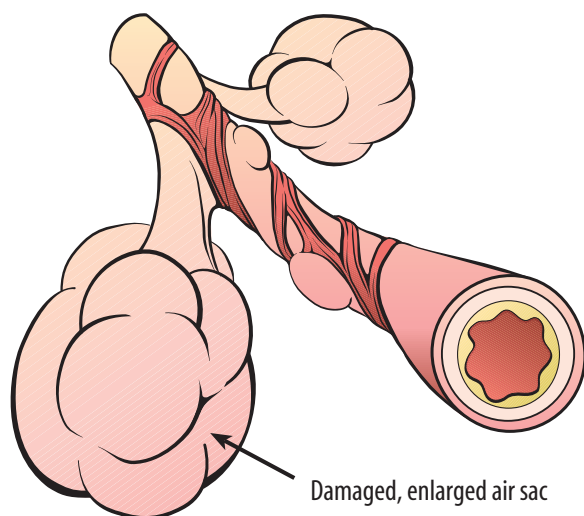
Waste air from the body (carbon dioxide –  $CO_2$ ) is carried by the blood vessels back to the air sacs to be exhaled through the airways, windpipe, and nose.

$CO_2$  passes from the blood vessels into the air sacs.

# How COPD Affects the Body

Doctors use the term COPD to describe two different diseases – emphysema and chronic bronchitis – because many people with COPD have a combination of these two diseases. In addition, some people with COPD may also have asthma-like symptoms or reactive airway disease. People with COPD may have worsening attacks from time to time, called acute exacerbations.

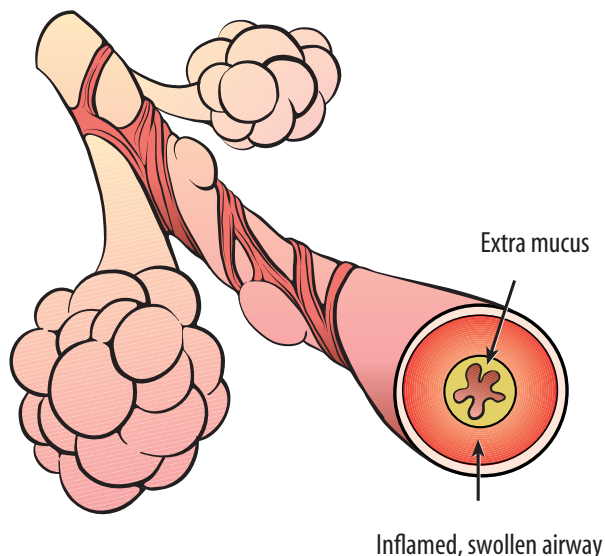
## Lungs With Emphysema



## Emphysema

With emphysema, the air sacs (alveoli) and small airways (bronchioles) are damaged and lose their elasticity (if you think of the air sacs as little balloons, they are worn out and never able to return to their normal size). When you breathe out, stale air becomes trapped inside the air sacs. This makes it harder for fresh air (oxygen) to come in and carbon dioxide ( $\text{CO}_2$ ) to go out. The blood vessels around the air sacs are also damaged, which prevents fresh air (oxygen) from reaching the blood stream and carbon dioxide ( $\text{CO}_2$ ) from going out of the body.

## Lungs With Chronic Bronchitis



## Chronic Bronchitis

With chronic bronchitis, the airways (bronchial tubes) become swollen and inflamed and produce large amounts of mucus. The swollen tissues and mucus can make breathing difficult, because the inside of the tubes become narrow or closed in. The airways (bronchial tubes) often become easily infected, because it is difficult to cough out the excess mucus.

# Causes of Chronic Obstructive Pulmonary Disease (COPD)

The most common cause of chronic obstructive pulmonary disease (COPD) is cigarette smoking, although only about 20% of smokers develop lung disease.

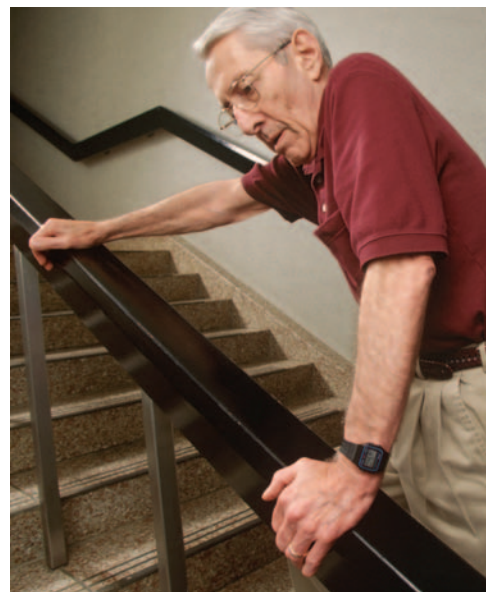
Other elements that may lead to the development of COPD are:

- Work-related dusts and chemicals (vapors, irritants, and fumes) and things in the environment, such as coal dust or silica
- Indoor air pollution from fuels used for cooking and heating in poorly ventilated homes
- Second-hand smoke may add to breathing problems and COPD
- Some patients who develop COPD have an inherited disorder called  $\alpha_1$ -antitrypsin deficiency; this disorder can be detected by a blood test
- Childhood respiratory infections may be linked with decreased lung function and increased breathing problems in adulthood

## Symptoms of COPD

Usually, people with COPD first notice problems with coughing or phlegm and then breathlessness (shortness of breath) during activities, such as stair-climbing and walking uphill. Symptoms sometimes creep up on people. Without realizing it, people may also cut back or stop doing some activities to prevent problems with breathlessness. Over time, breathlessness worsens, sometimes to the point that dressing and bathing become difficult. Oxygen ( $O_2$ ) levels in the blood may fall, and carbon dioxide ( $CO_2$ ) levels may rise, which can cause tiredness, poor concentration, and heart strain. The strained heart may enlarge and lead to swelling of the ankles and legs, called edema. People with COPD are also at risk for heart disease. COPD and heart disease often go together, because long-term cigarette smoking is one of the biggest risks for both diseases.

Although there is no cure for COPD, symptoms can be controlled to improve the quality of life. The lung and airway damage cannot be repaired, but ALL of the symptoms of COPD can be reduced if you take action. Your quality of life can be improved, and the length of your life can be extended. ***You can live well with COPD. It's up to YOU to take control.***





# Making the Diagnosis

The first step to find out if you have COPD is scheduling an appointment with your doctor and getting a good evaluation, including a detailed medical and work history and physical examination. The doctor may do a number of tests to evaluate your breathing.

These may include:

- Breathing tests (also called pulmonary function tests or spirometry)
- Chest x-ray
- Oxygen level measurements
- Blood tests
- Mucus (phlegm) culture
- Exercise tests



# Important Steps for Better Living With COPD

- Quit smoking
- Get flu and pneumonia shots
- Understand your COPD medicines
- Exercise and get good nutrition
- Conserve your energy and control stress
- Control your breathing
- Use oxygen therapy
- Manage acute exacerbations

## Step 1: Quit Smoking

If you have not quit, do it now. It is the best move you can make to improve your life with COPD. It can also be the most difficult thing you have ever tried to do. Nicotine is very addictive, and people often try 2 to 3 or more times before finally quitting for good. Studies have shown that each time you quit, you'll become stronger and learn more about what it takes for you to quit permanently.

### According to experts, these methods can help

- Use the nicotine patch, nicotine gum, or lozenge. They can help lessen the urge to smoke. Check with your doctor first to make sure the one you chose will not interfere with other medicines and to select the correct dosage. Be especially careful if you have heart or blood vessel problems. Ask your doctor about prescription medications that can also help. These include bupropion, nicotine inhalers, and nasal sprays.
- Use more than one medication to help with smoking cessation (bupropion and nicotine replacement). Many times this improves success.
- Get support and encouragement. Studies about people who formerly smoked show that the more support you have the better your chance of success. Counseling and/or a quit smoking program can be very helpful. Enlist family members and friends, especially ex-smokers, to help you resist the urge to smoke.
- Learn how to handle stress and urges to smoke. Make a plan to handle those pressures and situations that make you want to smoke, such as being around other smokers, drinking alcohol, and feeling stressed or depressed.



*Remember, your best chance of success is with the help of others.*

## Other Irritants and Allergens

Other substances you breathe in besides smoke can affect your lungs. The muscles around your airways can tighten when you breathe in dust or fumes from wood or coal-burning stoves or if you're exposed to higher levels of air pollution. If these things bother you, try to avoid or control them.

### FOR OTHER IRRITANTS AND ALLERGENS

- Avoid fumes, smoke, and strong odors
- Stay inside and/or decrease strenuous activity when air pollution levels are high
- Correct dampness problems in your home that promote mold growth
- Cover your mouth and nose when going out in very cold or windy weather
- If you have allergies in addition to COPD, try to stay away from pollens or other things that give you allergies

*Learn what things you are sensitive to and take steps to avoid or control them.*

### Step 2: Flu (Influenza) and Pneumonia Shots

Many people with COPD become very ill every year during flu season. The flu can greatly increase your chances of coming down with pneumonia.

- Stay away from people with colds and flu
- Wash your hands often to prevent the spread of germs
- Always ask your doctor about getting a flu shot every year at the end of September or in early October
- Flu and pneumonia shots are not the same, but they are both very important for people who have COPD
- If other people are using your phone, clean it afterward with an antibacterial gel
- If you are unable to get the flu shot (for example, people who are allergic to eggs cannot have a flu shot), make sure you get treatment as early as possible (there are special medicines available that are active against the flu virus)

Discuss with your doctor whether a pneumonia vaccine (sometimes called Pneumovax 23) is wise for you; generally, the vaccine is given every 5 to 7 years and is active against a common type of pneumonia.



### Step 3: Understand Your COPD Medicines

Help your doctor develop a medicine treatment plan that works for you. What you tell your doctor about your problems, activities, family, and lifestyle will help determine the best plan. Your doctor will ask about the medicines you take, including over-the-counter medicine and any complementary or herbal medicines. The doctor will want to know how well the medicine works and any side effects you are having. Be sure to tell the doctor about any medication allergies that you have. Remember to report any problems, no matter how minor. Write down any concerns and questions before your doctor appointments so you will not forget to ask them. Your doctor will try different medicines to discover what works best for you.



To best care for yourself while taking COPD medicine:

- Always carry a current list of medications with you. Include your medication allergies on the list.
- If possible, obtain your medications from only one pharmacy; the pharmacist will know your full medication and allergy history and be able to advise both you and the doctor about medication or food interactions.
- ALL medications can have some side effects, but the benefits may outweigh the side effects. Some people may experience no side effects, and others may have many side effects. Make sure you ask your doctor or pharmacist about the specific side effects of the medicine you are taking.
- Always ask your doctor about new medicines that may be available for your lung disease.

## COPD Medicines

Understanding your medicines and how to take them regularly and effectively is a very important step in living better with COPD. The medicines can greatly improve your breathing and other symptoms if taken correctly.

Many types of medicine are used to treat COPD. The most important are bronchodilators, which prevent and reverse the tightening of the muscles around the airways (bronchospasm), and anti-inflammatories, which reduce the inflammation and swelling of your airways. If the tightening and inflammation are controlled, problems with wheezing and shortness of breath should improve. Antibiotics are used for acute exacerbations, or worsening attacks.

- Set aside money for COPD medicine. Buy more before you run out.
- Ask your provider any questions you have about medicines. Your provider may need to change your medicines over time.



# Bronchodilators

## Anticholinergics – Short-Acting and Long-Acting

- Open airways by relaxing tight muscles around them.
- Always inhaled.
- Available as metered-dose inhalers, dry powder inhaler, or as a liquid for nebulization.
- Most often used together with short-acting or long-acting  $\beta_2$ -agonists.

### POSSIBLE SIDE EFFECTS

- Coughing
- Dry mouth
- Nausea
- Headache

ATROVENT®  
Ipratropium



COMBIVENT®  
Ipratropium and Albuterol



GENERIC  
Ipratropium



SPIRIVA®



DUONEB®



## Bronchodilators

### Beta<sub>2</sub>-Agonists – Short-Acting and Long-Acting

#### SHORT-ACTING BETA<sub>2</sub> AGONISTS

- Open airways by relaxing tight muscles around them.
- Usually inhaled, although occasionally taken as tablets.
- Available as metered-dose inhaler, dry powder inhaler, or as a liquid for nebulization.
- Carry the inhaler with you wherever you go for quick relief from sudden shortness of breath.
- An older medication is Alupent (metaproterenol); if you take this, you may want to discuss other options with your doctor.
- If you are taking oral beta<sub>2</sub>-agonists, discuss other options with your doctor. The oral medicine may have more side effects.

#### POSSIBLE SIDE EFFECTS

- Rapid heartbeat
- Nervousness
- Tremors and shakiness
- Nausea
- Dry mouth and throat
- Increased blood pressure
- Muscle weakness
- Decreased blood potassium level

PROVENTIL® HFA  
Albuterol



GENERIC  
Albuterol



## Bronchodilators

### Beta<sub>2</sub>-Agonists – Short-Acting and Long-Acting

#### SHORT-ACTING BETA<sub>2</sub> AGONISTS (CONTINUED)

COMBIVENT®  
Albuterol and Ipratropium



MAXAIR AUTOHALER®  
Pirbuterol



GENERIC  
Albuterol



DUONEB®  
Albuterol and Ipratropium



XOPENEX®  
Levalbuterol HCl Inhalation Solution



## Bronchodilators

### Beta<sub>2</sub>-Agonists – Short-Acting and Long-Acting

#### LONG-ACTING BETA<sub>2</sub> AGONISTS

- Open airways by relaxing tight muscles around them.
- Often dry powdered inhalers, although they are occasionally taken as tablets.
- The inhaled medicines are only taken twice a day.
- Not to be used for quick relief of shortness of breath.

#### POSSIBLE SIDE EFFECTS

(Very uncommon)

- Racing heart
- Tremors (shaking)
- Nervousness

SEREVENT® DISKUS  
Salmeterol



ADVAIR® DISKUS  
Combination Salmeterol (a bronchodilator)  
and Fluticasone (an anti-inflammatory)



FORADIL®  
Formoterol



VOLMAX®  
Albuterol





## Bronchodilators

### Methylxanthines

- Open the airways by relaxing tight muscles around them.
- Taken as pills.

Some Examples:

|                                      |                                     |
|--------------------------------------|-------------------------------------|
| UNIPHYL®<br>Theophylline, Anhydrous  | GENERIC<br>Hydrous Theophylline     |
| THEO-24®<br>Theophylline, Anhydrous  | SLO-BID®<br>Theophylline, Anhydrous |
| AEROLATE®<br>Theophylline, Anhydrous |                                     |

#### POSSIBLE SIDE EFFECTS

- Racing heart
- Tremors (shaking)
- Nervousness
- Nausea
- Headaches
- Insomnia (sleeplessness)
- Heartburn
- Seizures

#### Notes:

- For medications like these, it is very important to follow your doctor's instructions regarding how to take the medicine.
- Inform your doctor if you stop smoking or start taking any other medicines.
- Your doctor may request a blood test to check the theophylline level in your blood. This may be done with any change in the dose of theophylline or routinely once or twice a year.

### Over-the-counter Medicines

You may have tried some of the short-acting inhalers available without a prescription at drug stores. These medicines may cost less than the bronchodilator inhalers your doctor prescribes, but they don't save you money in the long run. They are much less effective and are used more often to get the benefit prescription medicines provide. They can also be dangerous. It's best not to use over-the-counter inhalers without the guidance of your physician.

### Expectorants

Expectorants (mucolytic medicines) are sometimes used to treat the increased mucus or thicker mucus that can occur with COPD. These medicines may help keep mucus thin and more easily cleared from the airways. These are taken as pills. The expectorant most commonly used for COPD is guaifenesin.

*Please report any problems with your medicines.*

# Anti-inflammatories

## Corticosteroids

- Also called glucocorticoids or steroids.
- Reduce inflammation and swelling of the airways.
- Not the same as anabolic steroids, which are muscle-building steroids misused by athletes.

### Remember:

Many people are uneasy about steroids and stop taking them or take less than the doctor prescribes. Steroids are meant to work over a period of time to reduce swelling of the airways. They must be used regularly to be effective. Always take steroids exactly as your doctor directs, even when you feel better or do not believe they are helping you. If you stop taking steroids, your breathing can get worse, sometimes much worse.

## Systemic Steroids (taken by mouth as a pill; affects the entire body)

Some Examples:

GENERIC  
Prednisone

MEDROL®  
Methylprednisolone



### POSSIBLE SIDE EFFECTS

You may notice after a few days:

- Fluid retention
- Increased appetite

You may experience after several months of use:

- Adrenal suppression  
(less able to handle stress)
- Decreased resistance  
to infection  
(get infections more easily)

You may experience after several months or years of use:

- Moon face
- Cataracts
- Excess facial hair
- Osteoporosis

### Notes:

- Steroids can have many side effects if taken over a longer period. Always ask the doctor, nurse, or pharmacist about potential side effects prior to taking the medicine.
- Ask your doctor or nurse how you can avoid some of the side effects by limiting salt intake and avoiding high-calorie foods.
- Always take with food or milk.
- Tell your doctor if you have diabetes, high blood pressure, or stomach ulcers before you begin taking steroids.
- Let your doctor know if you develop stomach pain, vomiting, or black stools while taking steroids.
- If you will be taking steroids long-term, wear a Medic Alert bracelet or necklace (available at drug stores) that shows you are taking systemic steroids.

## Anti-inflammatories

### Inhaled Steroids

- Reduce inflammation and swelling of the airways.
- Because they are inhaled, they **generally only** affect your lung and airways, not your entire body.
- Rinse your mouth, **gargle, and spit** after using them.

#### Notes:

- Inhaled steroids, in small doses, have fewer side effects than systemic steroids, because they do not affect the entire body.
- Large doses of inhaled steroids can have some of the same side effects as systemic steroids.
- To lessen the most common side effects, which are oral thrush (yeast infection of the mouth), sore throat, and hoarseness, rinse your mouth, gargle, and spit after use.

#### POSSIBLE SIDE EFFECTS

- Oral thrush  
(yeast infection of the mouth)  
and sore tongue
- Hoarseness

FLOVENT® POWDER AND MDI  
Fluticasone



ADVAIR®  
Combination of Flovent and Serevent



PULMICORT®  
Budesonide



AEROBID®  
Flunisolide



AZMACORT®  
Triamcinolone



QVAR® HFA  
Beclomethasone



# Antibiotics

Bacterial infections of the lungs (pneumonia) and airways (acute bronchitis) are very serious for people with COPD. They can cause further lung damage and make breathing more difficult. Bacterial infections cause many people with COPD to be hospitalized.

Antibiotics for people with COPD:

- Are not useful for viral infections, such as colds and flu.
- Work by killing germs (bacteria) that cause infection.
- Many different types are available. Your doctor will choose the best one for your infection.

Here's what you can do if you have to take antibiotics for an infection:

- Finish the entire prescription, even if you feel better. Quitting antibiotics early can cause some of the germs to survive and cause another, more severe, infection later.
- Tell your doctor if you are having a rash or some other unusual reaction to your antibiotic, especially if it is something that makes it difficult for you to take them.

## POSSIBLE SIDE EFFECTS

(Vary with different types of antibiotics)

- Stomach cramping
- Nausea
- Diarrhea
- Skin rash

*If you get lots of infections, try to 'tune in' to when one might be beginning so that you can get antibiotics early if your doctor thinks you need them.*

Some Examples:

LEVAQUIN®  
Levofloxacin



ZITHROMAX®  
Azithromycin



BIAXIN®  
Clarithromycin





## Antibiotics

AUGMENTIN®  
Amoxicillin-clavulanate



OMNICEF®  
Cefdinir



LORABID®  
Loracarbef



CEFTIN®  
Cefuroxime



SEPTRA DS®  
Trimethoprim-sulfamethoxazole



GENERIC  
Doxycycline



GENERIC  
Erythromycin



CIPRO®  
Ciprofloxacin



GENERIC  
Amoxicillin



AVELOX®  
Monofloxacin hydrochloride



KETEK®  
Telithromycin



*These medicines can have side effects and vary with different types of antibiotics. Your doctor or pharmacist can help you reduce side effects. Ask if the antibiotic can affect other medicines you are taking or if it should be taken after meals.*

**For all your medicines, remember:**

- Always take the medicine as prescribed.
- Complete the full medicine course.
- Discuss with your doctor whether you should take medicines before exercise or other activities.

### Note:

All the medicines listed in this booklet are examples of those currently available in the United States. Your doctor may prescribe others not listed, or you may be taking some not available in the United States. The medicines listed here may also have different brand names in other countries. No matter what medicine you are prescribed, always ask your doctor or pharmacist for an explanation of the medicine and how it is used.

# How To Take COPD Medicines

Many **bronchodilators** and **anti-inflammatories** come as sprays or powders that are used from an inhaler. Breathing in the medicine through the inhaler sends it directly to your airways and lungs. How well this medicine reaches your lungs depends on using the inhaler correctly. It's common for many people to have trouble using their inhalers. There are different types of inhalers, and each may require a slightly different technique. Ask your doctor or nurse to help you use your inhaler correctly.

## How to use a metered-dose inhaler (MDI)

### Remember:

Always breathe in the medicine **slowly** when using this type of inhaler, so that it can go deep into your lungs. Hold the medicine in for 10 seconds to allow it to settle into your lungs.



#### STEP 1:

Take off the cap, and shake the inhaler for 5 seconds with the metal canister inserted.



#### STEP 2:

Hold the inhaler like this — Sit up straight or stand, tilt your head back slightly, take a deep breath, and breathe out normally.



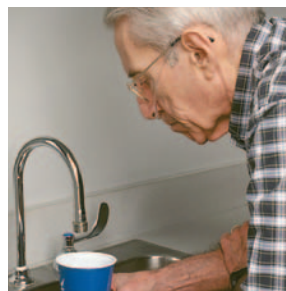
#### STEP 3:

Hold the inhaler about 1 1/2 to 2 inches in front of your open mouth. As you start to breathe in, push down once on the top of the inhaler, and keep breathing in slowly and deeply to carry the medicine far into your lungs (usually about 3 to 5 seconds).



#### STEP 4:

Hold your breath for up to 10 seconds with your mouth closed, then breathe out very slowly. This allows the medicine to deposit in the lungs. If you use more than one puff, resume normal breathing and then repeat the above steps for each puff of medicine.



#### STEP 5:

Afterward, if you are using inhaled steroids, rinse your mouth, gargle with water, and spit it out. This will help prevent a yeast infection in your mouth and throat.

# Spacers and Holding Chambers

It is better to use a spacer with the metered-dose inhaler, because many people have trouble coordinating breathing with the activation of the metered-dose inhaler. The spacer also reduces the amount of medicine deposited in the upper airways and allows the smaller particles of medicine to get deeper into the smaller airways. For this reason, the inhaler will be more effective with the use of the spacer, especially with inhaled steroids.

## How To Use an Aerochamber

### Note:

If you need more than one puff, resume normal breathing, and repeat the steps for each puff of medicine. If using inhaled steroids, remember to rinse out your mouth, gargle with water, and spit it out. Ask your doctor or nurse how to clean the spacer that you are using, or follow the package insert.



**STEP 1:**  
Shake the inhaler for 5 seconds.



**STEP 2:**  
Attach the spacer or holding chamber to the inhaler.



**STEP 3:**  
Take a deep breath in and breathe out normally. Sit up straight or stand, tilt your head back slightly, take a deep breath, and breathe out normally.



**STEP 4:**  
Close your lips around the spacer mouthpiece (make sure you remove the cap). Press the inhaler button to release a puff of medicine into the spacer. Breathe in **slowly and deeply** (usually about 3 to 5 seconds).



**STEP 5:**  
Hold your breath for up to 10 seconds.



**STEP 6:**  
There are many types of spacers and chambers; decide which one will work best for you.

# Dry Powder Inhalers

A dry powder inhaler is a device designed for breathing powdered medicine into the lungs without using an aerosol propellant. Drug makers offer inhaler medicine as powders, because some aerosol propellants harm the earth's ozone layer. Eventually, metered-dose inhalers with chlorofluorocarbon propellant will not be available. Several types of dry powder inhalers are available, and each requires a slightly different technique.

## How To Use a Diskus

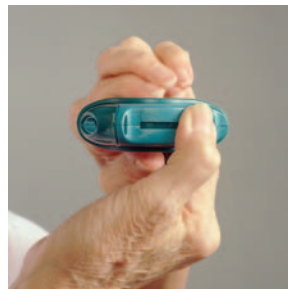
### Notes:

- Slide the thumb grip back to close the Diskus. Store it in a cool, dry place. Never wash it; moisture can affect the powdered medicine.
- The Diskus has a dose indicator on top. The number on the dose indicator shows how many doses are left in the Diskus. If you have problems seeing the numbers, use a magnifying glass.
- When there are five doses left in the Diskus, the numbers on the dose indicator will turn red.
- If you are left-handed, you may turn the Diskus upside down and follow the above steps.



#### STEP 1:

Hold the Diskus as shown. Push the thumb grip as far as it will go to the right to open the Diskus.



#### STEP 2:

Slide the lever to release the medicine until you hear a click. The Diskus is now ready to use.



#### STEP 3:

Take a deep breath in, and breathe out normally.



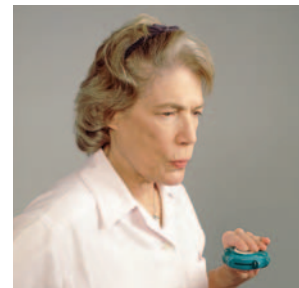
#### STEP 4:

Keep the Diskus level, and seal your lips around the mouthpiece. Breathe in as **quickly and as deeply** as you can on the mouthpiece.



#### STEP 5:

Remove the Diskus from your mouth, and hold your breath for up to 10 seconds. Never exhale back into the Diskus.



#### STEP 6:

Breathe out normally.



## How To Use a Turbuhaler®

Before using a new Turbuhaler®:

Remove the cap, and hold the Turbuhaler® with the mouthpiece up. Turn the brown grip on the bottom of the Turbuhaler® all the way to the right and back to the left. You will hear a click. Repeat this step one more time. The Turbuhaler® is now primed.

### Notes:

- Store the Turbuhaler® in a cool dry place.
- Never expose it to moisture or humidity.
- How to tell when the Turbuhaler® is empty:

When the red dot appears at the top of the window, there are 20 doses left. Plan to get a new Turbuhaler® when you see the red dot.

When the red dot is at the bottom of the window, the Turbuhaler® is empty.



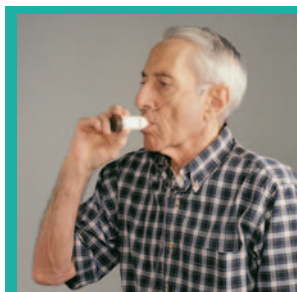
**STEP 1:**  
Remove the cover.



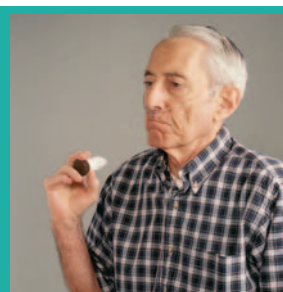
**STEP 2:**  
Hold the Turbuhaler® upright with the mouthpiece up.



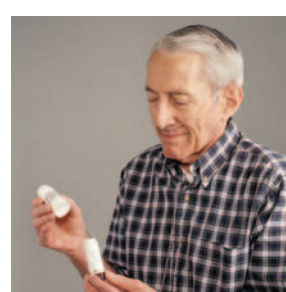
**STEP 3:**  
Turn the brown grip left, then right, until it clicks.



**STEP 4:**  
Take a deep breath in, and then breathe out normally. Grip the mouthpiece with your teeth, and seal your lips around it. Keep the Turbuhaler® level and breathe in as **quickly and as deeply** as you can on the mouthpiece.



**STEP 5:**  
Hold your breath for up to 10 seconds, and breathe out slowly with the Turbuhaler® away from your mouth. Never exhale back into the Turbuhaler®.



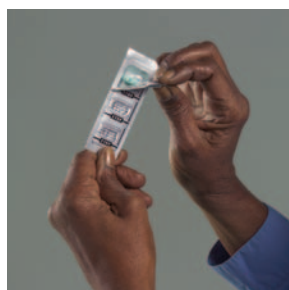
**STEP 6:**  
Replace the cover. Rinse your mouth, gargle with water, and spit it out.

**REPEAT IF SOME POWDER REMAINS**

## How To Use the Foradil® Aerolizer®

### Notes:

- Do not open the foil packets until immediately before use.
- Never place the capsule directly in the mouthpiece.
- Do not swallow the capsule.
- Do not wash the inhaler; a new one is included with each month's supply of medicine.



#### STEP 1:

Peel the paper backing from the blister card, and push the capsule through the remaining foil.



#### STEP 2:

Remove the cover of the Aerolizer® inhaler, and twist open the mouthpiece (the arrow on the mouth piece shows you which way to twist it).



#### STEP 3:

Put a capsule in the Aerolizer® chamber, and twist the mouthpiece closed.



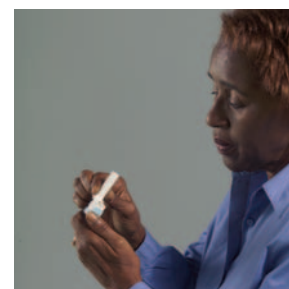
#### STEP 4:

With the Aerolizer® held upright, press both side buttons once only, and release. You will hear a click as the capsule is punctured. If you do not release the buttons, the capsule will not spin.



#### STEP 5:

Place your mouth on mouthpiece, and tilt your head back slightly after fully exhaling. Hold the inhaler with blue buttons facing sideways, and inhale. Breathe in fast, steadily, and deeply. As the medicine is released, you will feel a sweet taste on your tongue and hear a whirring noise. (If you don't, the capsule may be stuck. Just tap on the side of the inhaler and inhale again. Do not press the side buttons again.) Remove the inhaler from your mouth, and hold your breath for as long as you comfortably can (about 10 seconds).



#### STEP 6:

Open the inhaler to see if any powder remains, if it does, repeat another breath. Discard the empty capsule.

## How To Use the Spiriva HandiHaler®

### Notes:

- Capsules should always be stored in the sealed blisters and only removed immediately before use.
- The drug should be used immediately after the packaging is opened, otherwise the effectiveness may be reduced.
- Each blister card consists of two blister strips, each containing three capsules, joined along a perforated-cut line. Prior to using the first capsule from the blister card, separate the blister strips by tearing along the perforation.
- After using the first capsule in the blister strip, the two remaining capsules should be used over the next 2 days.
- Do not store capsules in the HandiHaler® device.
- A new device is included with each month's supply of medicine. If cleaning is needed, open the dust cap and mouthpiece. Open the base by lifting the piercing button. Rinse the entire inhaler with warm water to remove any powder. Do not use cleaning agents or detergents. Dry the device thoroughly by tipping the device over to drain the water, and air dry the device leaving the dust cap, mouthpiece, and base open. It takes 24 hours to air dry; so, clean it right after you use it.



#### STEP 1:

Open the blister card by peeling back the foil, using the tab, until one capsule is fully visible. The foil cover should only be peeled back as far as the STOP line printed on the foil.



#### STEP 4:

Close the mouthpiece firmly until you hear a click, leaving the dust cap open.



#### STEP 7:

To ensure you get the full dose of Spiriva, you must repeat the last step. After you have finished taking your daily dose of Spiriva, open the mouthpiece again, tip out the used capsule, and dispose. Close the mouthpiece and dust cap for storage.



#### STEP 2:

Open the HandiHaler® by pulling the dust cap upwards. Open the mouthpiece.



#### STEP 5:

Hold the HandiHaler® device with the mouthpiece upwards, and press the piercing button completely in once, and release. This makes holes in the capsule and will allow the medication to be released when you breathe in.



#### STEP 3:

Place the capsule in the center chamber. It does not matter which end of the capsule is placed in the chamber.



#### STEP 6:

Breathe out completely before placing the mouthpiece in your mouth. Raise the device to your mouth, and close your lips tightly around the mouthpiece. Keep your head in an upright position, and breathe in slowly and deeply but at a rate sufficient to hear the capsule vibrate. Breathe in until your lungs are full. Remove the mouthpiece, and hold your breath for about 10 seconds.

# Nebulizers

Your doctor may prescribe a form of liquid medicine that must be breathed in by using a nebulizer. A nebulizer turns medicine into a mist that can be breathed in slowly through a mouthpiece. There are different brands and types of nebulizers, and the medicine used comes in different forms.

Discuss the long-term use of a nebulizer with your doctor; with proper technique, you will be able to receive the same amount of medicine using a metered-dose inhaler, and there is less chance of infection.

## How To Use a Nebulizer

### Notes:

- It is very important to clean the nebulizer after each use and let it air dry to prevent infection.
- Do not leave liquid medicine in the nebulizer cup between uses.



**STEP 1:**  
Prepare your nebulizer cup and the correct amount of medicine.



**STEP 2:**  
Take a deep breath in, and breathe out normally. Place the mouthpiece between your teeth, and close your mouth around it. Place your thumb over the finger port, if used.



**STEP 3:**  
You may breath in and out normally, although it is better if you can take several slow deep breaths at a time and rest in between each series of breaths.



**STEP 4:**  
Tap the side of the cup occasionally to keep the medicine droplets at the bottom of the cup.



**STEP 5:**  
Keep breathing in and out until the nebulizer sputters.



**STEP 6:**  
Take the nebulizer apart, and clean and dry it according to the manufacturer's instructions.

# Your Medicine Schedule

## Work with your doctor to learn all you can about your medicines and how to use them effectively.

It's never easy to form new routines, but these tips can help you make and stick to a schedule for taking your medicines. Your goal is to use your medicines correctly every day to breathe easier and feel good.



## List daily activities that match times for taking your medicines.

For instance, brushing your teeth, eating meals, going out for a walk, or the times of your favorite television shows.

## Match your medicines with an activity.

Make a list of your medicines and the times they should be taken. Then, place the medicine near a cue to help you remember to take it when you do a matching daily activity. For example, place an inhaler near your toothbrush to help you remember to use it in the mornings and evenings. Place other medicines on your table to remember to use them with your meals, or place them near your TV remote control. Use any cue that will help you remember. You may want to invest in a pillbox that has slots for the different times of day and for every day of the week. You would then pack the pillbox with a week's supply of medicine.

## Pay attention to problems.

It may take time to form a schedule that works for you. Different things work for different people. Changes may have to be made. You may need to wear a wristwatch with an alarm set for your medication times. Or, tape a small schedule to your telephone with brightly colored tape. Or, place an inhaler near your car keys to remember to take some medicine with you when you leave the house.



*Remember, it may not be easy, but, in time, your medicine schedule will become a part of your everyday routine.*

*Quitting smoking and taking your medicines regularly and effectively are the two most important steps you can take to live better with COPD.*



## Step 4: Exercise and Get Good Nutrition

COPD makes the lungs and heart work harder to carry oxygen to all parts of the body. Because of this, you should control your weight to reduce heart and lung strain. Work with your doctor to develop a program of exercise that is right for you. Special exercises to strengthen your chest muscles can improve your breathing. Aerobic exercise, such as walking and riding a bike, is very important for increasing your stamina, or “staying power,” and improving your ability to do daily activities. Strength training for the upper body can produce added benefits.



## Pulmonary Rehabilitation

Pulmonary rehabilitation may help you reduce the impact of COPD by helping to control or reduce breathlessness and recondition the body so that you feel less shortness of breath. What’s more, with exercise, education, and breathing retraining, people with COPD can experience some great benefits, such as less need for medications and hospital stays and an even longer survival.



## Goals of Pulmonary Rehabilitation

- Improve quality of life
- Obtain more independence and less dependence on others
- Reduce hospitalizations and doctor visits
- Reduce respiratory symptoms
- Reverse anxiety and disease-related stress
- Increase knowledge about COPD and related lung disease
- Increase exercise ability
- Achieve better ability to perform activities of daily living
- Increase survival (in some people)
- Return to work (for some people)



It is especially important after an acute exacerbation of chronic bronchitis to have pulmonary rehabilitation, because many people become deconditioned from a hospital stay or bedrest. During an acute exacerbation (AECB), lung function may get worse and breathlessness may increase. Also, steroids, an important and necessary medication used to treat people with acute exacerbations, may have the effect of causing muscle weakness. Fortunately, even after acute exacerbations of chronic bronchitis, these symptoms can be reversed with pulmonary rehabilitation. Patients can become reconditioned, improve their lung function, decrease their breathlessness, and strengthen their muscles.



## Pulmonary rehabilitation offers:

- Structured and monitored exercise training
- Nutrition advice
- Techniques for reducing and controlling breathing problems
- Education about maintaining and improving function
- Help to quit smoking
- Information about your disease and ways to cope
- Emotional and psychological support



*You can benefit tremendously from pulmonary rehabilitation. Discuss it with your doctor.*

## Good Nutrition

Maintaining good health is impossible without eating the right foods. Speak with your doctor or nutrition specialist if you need help in planning and preparing healthy meals. Some people with COPD have trouble keeping weight on, and it is easy to lose muscle mass when you lose weight. If this is a problem for you, discuss nutritional supplements with your doctor or nutritionist. Staying at a healthy weight is very important for controlling COPD.



*It is important to keep your weight 'just right.'*



## Many people with COPD find it helpful to:

- Eat several smaller meals throughout the day instead of three large ones. Because your stomach is directly under your lungs, eating a big meal can push against your diaphragm and make it harder to breathe.
- Avoid gas-producing foods, such as apples, broccoli, brussel sprouts, cabbage, corn, cucumbers, and carbonated beverages. These foods can cause your stomach to swell and press against your diaphragm.
- Drink plenty of fluids to keep airway mucus thin and free-flowing.
- Talk less while you are eating.
- Slow down when you are eating.

## Step 5: Conserve Your Energy and Control Stress

Most people with COPD must learn to pace themselves to avoid getting worn out throughout the day. Conserve energy with these practical tips, and you'll get more accomplished without getting short of breath.

- Move slowly to conserve energy and avoid breathlessness.
- Use a cart with wheels to move dishes, tidy up, work in the garage, put away clean laundry, and so on. This will reduce trips back and forth and save you the burden and trouble of carrying things.
- Sit to dress, undress, shave, put on makeup, and cook. Sit for as many tasks as possible.
- Arrange your house so that most things you use are at waist level or within easy reach. Avoid bending and lifting as much as possible.
- Take rests after meals when your body is working hard to digest food.
- Invest in a shower stool and hose sprayer for bathing. Dry off by wrapping up in a terrycloth robe.
- Use assistive ("helping") devices, such as a long-handled reacher, for pulling on socks and shoes and for reaching things in high places. Long-handled tongs can help you pick up objects without bending.



The specialists involved in pulmonary rehabilitation can give you additional help in finding ways to save your energy. Try to plan ways to make your daily routine less taxing and tiring. Spread out what you have to do over several days if you can. **Rest when you need to.**

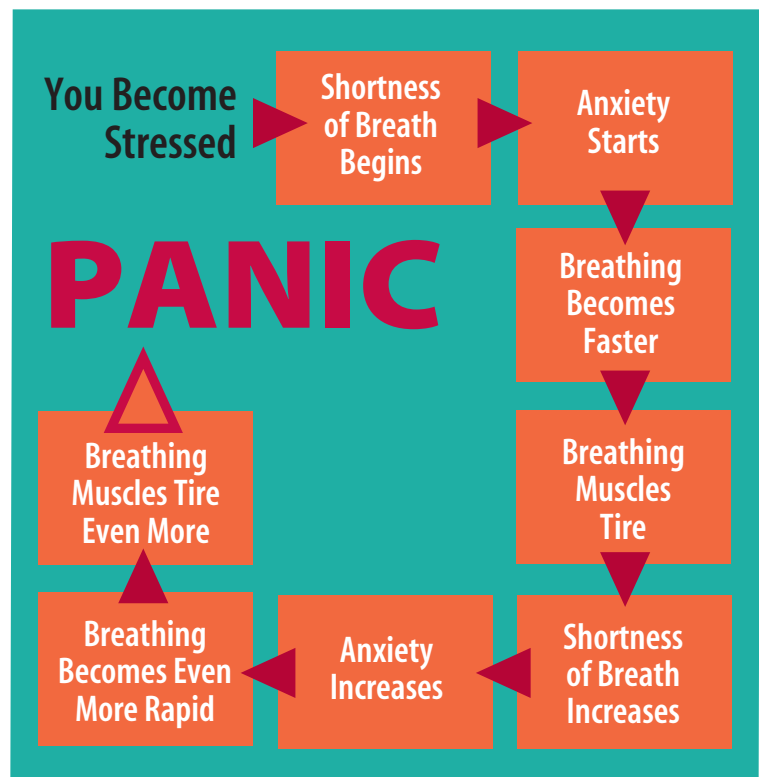
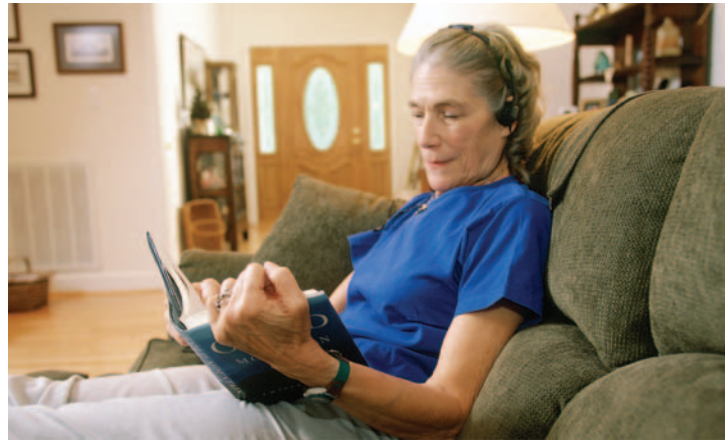
## Control stress

Feeling stressed can make breathlessness much worse. When you have trouble getting your breath, anxiety can cause you to breathe even faster, tire your chest muscles, and lead you to panic. This cycle is common for people with COPD, but there are steps you can take to stop stress before it overwhelms you.

## Learn to relax

Stress is less likely to build to anxiety if you know how to relax yourself when you start to feel tense. Find what works for you.

- Try yoga, prayer, meditating, or listening to relaxing music.
- Some people like to get comfortable, close their eyes, and imagine themselves in a relaxing, pleasant place doing something they enjoy doing. Concentrate – feel the soft breeze on your face or the warm sand at your feet – whatever relaxes you. Don't stop until you feel relaxed.
- Slowly tense and relax each part of your body. Start with your toes and work all the way up to your scalp. Breathe in as you tighten, and breathe out as you relax. Practice pursed-lip and diaphragmatic breathing.



## Step 6: Control Your Breathing

### Pursed-Lip Breathing

Pursed-lip breathing not only helps you relax, but it also helps you get more oxygen into your lungs and prevents shortness of breath. Practice this breathing technique until it works well for you.



#### STEP 1:

Relax your neck and shoulder muscles. Inhale (breathe in) slowly through your nose, and count to 2 in your head.



#### STEP 2:

Pucker your lips as if you are whistling. Exhale (breathe out) slowly and gently through your lips while you count to 4 or more in your head. Always exhale (breathe out) for longer than you inhale (breathe in). This allows your lungs to empty more effectively.



## Diaphragmatic Breathing (Abdominal Breathing)

With COPD, trapped air in the damaged air sacs often causes the lungs to over expand. This prevents your diaphragm (the main breathing muscle) from moving as much. Learning to relax your abdominal muscles as you breathe in gives your diaphragm more room to move. You'll be able to take more air in. Tightening your abdominal muscles as you breathe out moves more air out of your lungs. Practice this technique with pursed-lip breathing until it becomes a habit.



### STEP 1:

Get into a comfortable position. Relax your neck and shoulder muscles.



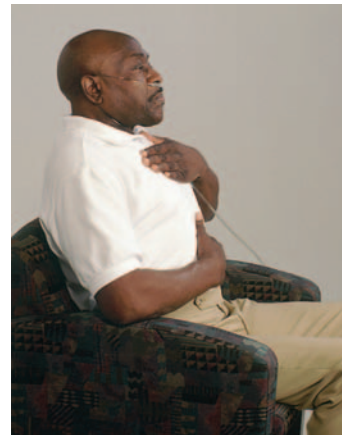
### STEP 2:

Put one hand on your abdomen and one on your chest.



### STEP 4:

Inhale (breathe in) slowly through your nose to the count of 2. Feel your abdominal muscles relax. Your chest should stay still.



### STEP 5:

Tighten your abdominal muscles, and exhale (breathe out) while you count to 4. Feel your muscles tighten. Your chest should stay still.

## Techniques to Help Clear Mucus From Your Lungs

Ask your doctor about different methods to help you cough up mucus. The Acapella™ and the Flutter® devices are two handheld devices that assist in clearing mucus from the lungs. Both of these devices create a vibration and back pressure in the lungs to help keep the airways open and move mucus up and out of the lungs. Learning how to use these devices, along with diaphragmatic breathing and huff coughing, will make it easier to get rid of mucus in the lungs.

### HUFF Cough: Forced Expiratory Technique

- Repeat this cycle two to four times.
- Spit out the mucus as it comes up.



#### STEP 1:

Sit comfortably in a chair. Take three to five slow, deep breaths using pursed-lip and diaphragmatic breathing.



#### STEP 2:

Take in a normal breath.



#### STEP 3:

Squeeze your chest and abdominal muscles – open your mouth – and force out your breath while whispering the word “huff” (sounds like a forced sigh). Some people find it helpful to press on the lower chest at the same time. Repeat once.



#### STEP 4:

Return to pursed-lip and diaphragmatic breathing.



## Step 7: Use Oxygen Therapy

Eventually, many people with COPD will need supplemental oxygen. If your disease has progressed to where your lungs can't supply enough oxygen to meet your body's needs, your doctor may prescribe home oxygen therapy. Having too little oxygen in the blood is called hypoxemia. Symptoms include sleepiness, morning headaches, irritability, poor concentration, worsening breathlessness, and fluid retention. Low oxygen levels can put a strain on the heart, and it won't pump as efficiently.

Many people resist using oxygen, because they fear it will reduce their independence or they will become addicted. In fact, oxygen therapy usually improves energy and breathing so that your quality of life is better. It improves the oxygen exchange in your body and may prevent some complications of COPD. Use oxygen as directed by your doctor. It will improve your quality of life, and you will live longer. Ask your doctor about how long you should use oxygen each day. For many people, more oxygen use, not less, will add years to life.

Lately, there have been new developments in oxygen equipment that make it much easier and convenient to use. Tanks are more portable and lightweight. Newer systems last longer. Oxygen systems are available either as continuous flow or intermittent flow. Intermittent flow systems are called conserving devices or pulse oxygen devices, which are breath-activated. The oxygen in the tank will last longer with a conserving device. This means that the oxygen tank can be used for longer periods of time with intermittent flow without the need to refill or change the tank. However, some patients still need to have constant flow, especially when they are asleep and cannot trigger oxygen flow by breathing. Before deciding on a pulse system, ask your doctor to order a walk test on the pulse system to make sure you are getting enough oxygen flow for your needs. Conserving devices are not for everyone; they are best with people who only require low-flow oxygen (1 to 2 liters with activity). For people who require a high flow of oxygen, there are several cannulas available that have a 'reservoir' to store a small amount of oxygen. One of these is called the 'pendant' cannula. Ask about this if you require 4 or more liters of oxygen.



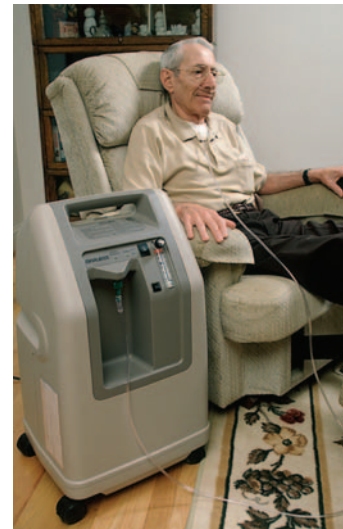
### COMPRESSED GAS IN CYLINDERS

Can be used out of the home on shoulder straps or on a wheeled cart.



### LIQUID OXYGEN IN RESERVOIRS

Can be used out of the home on shoulder straps or on a wheeled cart. Always keep the unit upright. Placing the unit on its side can cause the oxygen to evaporate.



### A CONCENTRATOR THAT EXTRACTS OXYGEN FROM THE AIR

Most commonly used in the home. It runs on electricity.

Oxygen can be delivered by:



NASAL PRONGS



TRACHEOSTOMY TUBE



TRANSTRACHEAL OXYGEN  
THERAPY

#### Note:

Oxygen is prescribed as a flow rate of liters per minute. Make sure you use it at the correct flow rate. **Using too much can be dangerous.** The flow rate should not be changed without consulting your doctor. Often you will be given a different flow rate of oxygen for when you are sleeping and for when you exercise.

Oxygen will not explode or burn, but it does cause things to burn faster. The plastic tubing can also catch fire. Be careful not to use the oxygen near a flame of any kind, including a lighted cigarette or gas range.

*Do not use aerosol sprays, such as air fresheners, hairspray, vapor rubs, or petroleum-based jelly near your oxygen unit. These items are all very flammable.*

## Travel With Oxygen

Traveling with oxygen can be done with ease, but it takes planning to ensure enough oxygen for the trip and for use at your destination. Air travel requires more planning and coordination with the airline. Talk with your doctor and oxygen supplier for advice about traveling.



## Step 8: Manage Acute Exacerbations of Chronic Bronchitis

You may hear your doctor or health-care provider talk about an acute exacerbation. This means a worsening, or ‘flare-up,’ of symptoms or bad attack, usually caused by an infection. Sometimes the cause of the ‘flare-up’ is not known. People with chronic bronchitis may repeatedly have these infections. You can prevent these infections, or catch them early, if you are “tuned-in” to your symptoms.

### LOOK FOR SIGNS OF AN ACUTE EXACERBATION:

- Changes in mucus color and amount
- More mucus or difficulty coughing mucus up from the lungs
- More severe cough or more frequent coughing
- Cold or flu symptoms, such as runny nose, sore throat, achy feeling, chills, fever, or feeling of feverishness
- Increased shortness of breath with activities or at rest
- Wheezing or whistling sound in the chest

Colds and the flu are caused by a virus but may lead to a bacterial infection in people with COPD, which will require treatment with an antibiotic. It is very important to recognize early symptoms to prevent bad attacks or hospitalization. **Participate in a treatment plan with your doctor and become the master of your disease.**

### HOW TO MANAGE AN ACUTE EXACERBATION:

- Follow prescription directions carefully and finish all your medicine every time your doctor prescribes an antibiotic, even if you start to feel better.
- Use expectorants to bring up extra mucus.
- Talk to your doctor about your oxygen therapy; your oxygen therapy needs may change during this time.
- Take other medicines, such as steroids and bronchodilators, that may be needed during an acute exacerbation — even if you do not normally take them.

## Call your doctor immediately if:

- You are more short of breath.
- Your cough gets worse.
- You are coughing up more mucus or having trouble getting mucus up.
- Your mucus changes from clear or white to green or yellow.
- You are coughing up blood or mucus with blood in it.
- You have fever or chills or feel general achiness or fatigue

# Surgical Options

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You may have heard about surgical treatments for COPD, primarily for people with emphysema. These surgical treatments are called lung volume reduction and lung transplantation. Some people have improved function from these procedures, but many will not benefit. A small percentage of people with COPD can be considered for these surgical options.

## Lung Volume Reduction Surgery

Because air is trapped in the damaged lung tissues of people with emphysema, the lungs stay expanded like a balloon and tight inside the rib cage. The diseased tissue crowds the healthy tissue. The lungs also push against the diaphragm. This crowding in the chest adds to breathing difficulty for people with emphysema.

Lung volume reduction surgery removes diseased portions of one or both lungs. When these portions of the lung are removed, the volume of the lungs inside the rib cage is reduced, making it easier for people to breathe.

## Are You a Candidate?

- The majority of people with emphysema have diseased tissue throughout their lungs. In most cases, there must be a localized area for removal to make the surgery worthwhile. This means damage from emphysema usually must be localized to a specific area or areas in your lungs.
- You must also be strong enough to undergo the surgery.
- You must be on optimal medical therapy.
- You must participate in a pulmonary rehabilitation program.
- You cannot be smoking.
- The decision for lung volume reduction surgery is based on results of testing done before and after pulmonary rehabilitation.

## Lung Transplantation

Lung transplantation involves replacing one, or sometimes both, of your diseased lungs with a donor lung. To be considered a candidate, generally you must:

- Be oxygen dependent.
- Have severe COPD that no longer responds to medical treatment and may be fatal in 2 years.
- Be physically able to undergo surgery and the treatment that follows.
- Be under the age of 65 and, at some centers, you must be under the age of 60.

If you are considered a candidate, you will undergo many tests and procedures to assess your physical and emotional condition. If the assessment goes well, you will be placed on a national lung donor list to wait for a donor lung.

Lung transplantation has many risks, and donor lungs are not readily available. Waiting for a donor lung can sometimes take 2 or more years. Also, after surgery, you will need to take many different medications to prevent rejection of the transplanted lungs and to prevent infection.

*With this surgery and lung volume reduction surgery, you must very carefully weigh all the issues involved. Make sure you discuss this with someone who is an expert in surgical options.*



# Glossary and Abbreviations

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## **Acute exacerbations of chronic bronchitis**

A flare up or a bad attack that is usually caused by an infection in the lung, but it is not always known why there is a worsening of symptoms. Usually accompanied by more mucus, coughing, and breathlessness.

## **Air sacs (alveoli)**

Tiny balloon-like sacs, located deep within the lungs. From these sacs, oxygen and carbon dioxide are passed to the blood by tiny vessels (capillaries). Note: alveoli means “bunches of grapes” in Italian.

## **Alpha-one-antitrypsin**

A kind of protein that most people are born with that helps to keep the lung elastic. In some people, it is missing and leads to the development of emphysema.

## **Antibiotics**

Medications that are effective against infections, usually bacteria, but some special antibiotics are made to fight viruses.

## **Anticholinergics**

Medications that have an effect upon smooth muscle in the airways. When inhaled into the lung, anticholinergics decrease muscle spasms or tightening of the airways.

## **Anti-inflammatories**

A class of drugs, often corticosteroids, used to help reduce inflammation and swelling of the airways.

## **Beta<sub>2</sub>-agonists**

These medications can be short-term or long-term and work to open the airways by relaxing tight muscles around them.

## **Airways (bronchial tubes)**

From the windpipe into the lungs, through which air passes during breathing.

## **Bronchioles**

Small airways in the lung; they connect the bronchial tubes and the air sacs.

## **Bronchodilators**

Medications that relieve the tightening of the airways and that are in pill form or inhaled form. They include anticholinergics and short-term and long-term beta<sub>2</sub> agonists.

## **Carbon dioxide (CO<sub>2</sub>)**

A waste product of body metabolism that is removed only by the lungs when breathed out. It gets transferred from the blood through the air sacs in the lung.

## **Chronic bronchitis**

An inflammation, or constant swelling and irritation, of the airways that causes increased production of mucus. It is considered chronic (or long-term) when a person is coughing and producing excess mucus for most days of the month (at least 3 months of a year or 2 or more years in a row).



### **COPD (chronic obstructive pulmonary disease)**

A term to describe two diseases, emphysema and chronic bronchitis with airflow obstruction. Patients may experience either or both of these conditions.

### **Corticosteroids (glucocorticoids, steroids)**

Medications that work to decrease inflammation and swelling of the airways. They can be taken in pill form or inhaled. Corticosteroids are not to be confused with anabolic steroids used by athletes to build muscles.

### **Diaphragm**

The large muscle underneath the lungs that moves down when breathing in to allow air with fresh oxygen to be pulled into the lungs and moves up to force “waste” with carbon dioxide out of the lungs when breathing out. It is the main breathing muscle in the body.

### **Emphysema**

Part of COPD that involves the tiny air sacs in the lungs (alveoli). In emphysema, the lungs lose elasticity, which causes the air sacs to become enlarged, making breathing difficult. In advanced emphysema, there are large empty spaces in the lung.

### **Hypoxemia**

Having too little oxygen in the blood.

### **Lung volume reduction surgery**

An operation in which damaged parts of the lung are removed, allowing the healthy, remaining parts to work better and fill the space inside the rib cage.

### **Mucus (phlegm)**

A slippery substance produced by certain membranes in the body. In normal, healthy people, mucus moistens and protects these mucous membranes. However, in COPD, too much mucus is produced in the lungs, resulting in clogging, blocking, and coughing, which make breathing more difficult.

### **Nebulizers (atomizer)**

A machine that can produce an extremely fine spray for deep penetration of medicine in the lungs.

### **Oxygen (O<sub>2</sub>)**

A gas that provides the body with energy. When breathed in, it is pulled into the lungs, where it is transferred to the blood through the air sacs (alveoli). People who do not get enough oxygen into their systems may need oxygen therapy.

### **Pulmonary rehabilitation**

A multidisciplinary program of exercise, education, and breathing retraining meant to help people with COPD stay conditioned, reduce symptoms of breathlessness, and improve lung function and attitude in order to improve quality of life.

### **Reactive airway disease**

Often referred to as asthma, people with this disease have airways that are very sensitive to irritants, causing tightening of muscles and more mucus production. Some people with COPD also have reactive airway disease.

### **Spirometry**

A way of measuring the amount of air entering and leaving the lungs. This is one of the ways doctors and other health-care providers can diagnose COPD.

### **Windpipe (trachea)**

Air flows through this tube from the mouth and nose, down the throat, and into the lungs.

**Other patient education guides available from the ACCP  
in print and on the ACCP Web site ([www.chestnet.org](http://www.chestnet.org)) are:**

Controlling Your Asthma (English and Spanish versions available)

Flexible Bronchoscopy

Cough: Understanding and Treating a Problem With Many Causes

Mechanical Ventilation Beyond the Intensive Care Unit

Pulmonary Rehabilitation: A Team Approach To Improving Quality of Life

**Additional Resources:**

[www.thoracic.org](http://www.thoracic.org)

[www.yourlunghealth.org](http://www.yourlunghealth.org)

[www.goldcopd.com](http://www.goldcopd.com)

[www.copdresourcenetwork.org](http://www.copdresourcenetwork.org)

[www.nationaljewish.org](http://www.nationaljewish.org)

[www.lungusa.org](http://www.lungusa.org)

[www.smokefree.gov/talk.html](http://www.smokefree.gov/talk.html)

[www.centerwatch.com](http://www.centerwatch.com)

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