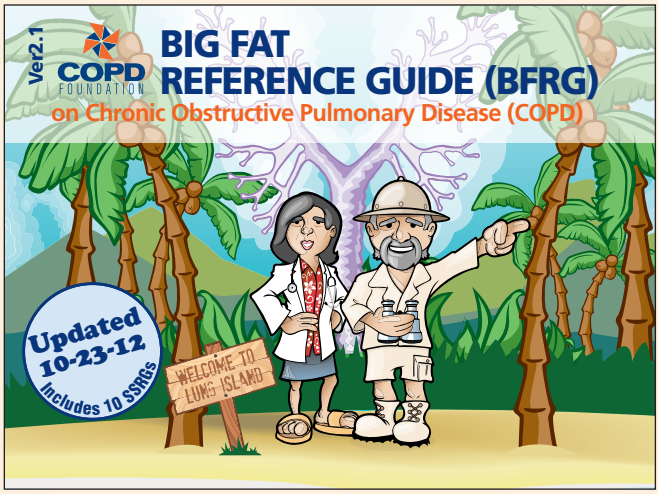
COPD Foundation's
Slim Skinny Reference Guide® (SSRG)

Understanding Lung Disease

COPD FOUNDATION

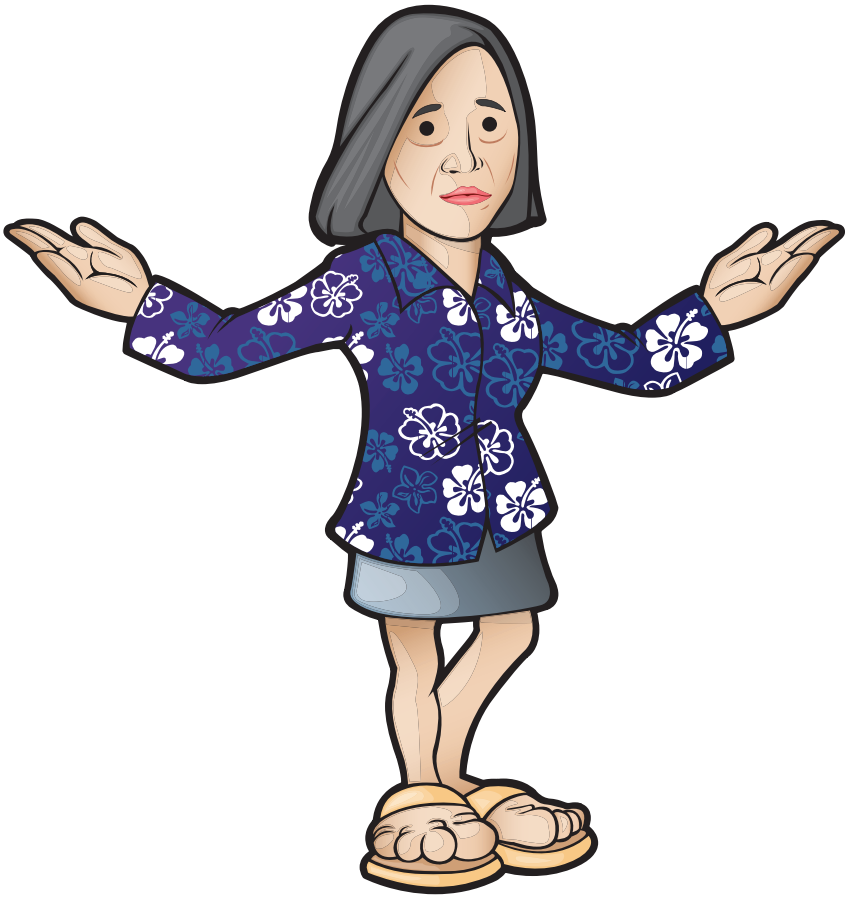


This "Slim Skinny Reference Guide: Understanding Lung Disease" is part of the COPD Foundation's *Slim Skinny Reference Guide*® series which has been taken from the *COPD Big Fat Reference Guide*®. To access the complete *COPD Big Fat Reference Guide*®, visit www.copdbfrg.org.

The mission of the COPD Foundation is to develop and support programs which improve the quality of life through research, education, early diagnosis, and enhanced therapy for persons whose lives are impacted by Chronic Obstructive Pulmonary Disease (COPD).

Finding out you have lung disease can be confusing and scary.

Learning more about your disease can help you know how to feel better. You will be less confused and able to manage your disease better. This will help you stay as healthy and active as possible.



Parts of the Respiratory System

Larynx *(lare-inks): the part of your throat that leads to the lungs. Air flows down the larynx into the lungs.*

Diaphragm *(die-a-fram): the muscle that separates the chest cavity from the stomach. The diaphragm is the main muscle we use for breathing. When the diaphragm muscle tightens, the lungs expand.*

Bronchial *(brawn-key-el)* ***tubes*** *and* ***bronchioles*** *(brawn-key-oles): the airways of the lungs. Air flows through these tubes into and out of the lungs. Bronchial tubes are the larger airways. Bronchioles are smaller airways that lead to the alveoli (see below).*

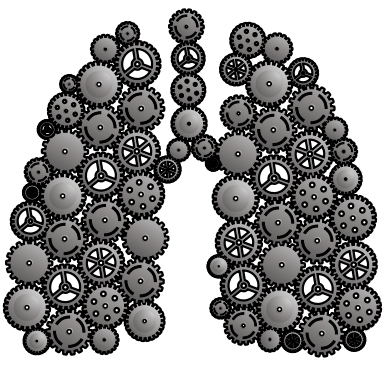
Alveoli *(al-vee-oh-lee): these are millions of tiny sacs at the very ends of the smallest tubes in the lungs. Oxygen is absorbed into the blood and carbon dioxide is released from the blood here.*

Cilia *(seal-lee-ah): tiny, hair-like fibers that line the bronchial tubes. They help move mucus up the tubes so it can be coughed out.*

How the Lungs Work

To understand your disease better, you need to know how the lungs work.

The number of times you breathe each minute is called your respiratory rate. This is controlled by your brain. You brain sends signals down the nerves to the muscles in your chest and between your ribs. This signal tells your muscles to tighten and relax.



When you tighten and relax the muscles around your lungs, you move air in and out. When you tighten these muscles, the diaphragm moves down. The ribs move up. Air enters the lungs. When you relax the muscles, the diaphragm moves up. The ribs tilt down. Air is pushed out of the lungs.

Air travels through your nose or mouth, into the **larynx** and into the lungs. Air moves further into your lungs through the lungs airways **(bronchiole)**. The air ends up in air sacs at the ends of these airways.

These sacs are called **alveoli**. These are the actual working units of the lungs. In these air sacs, oxygen (from the air you breathed in) is absorbed into the blood. Carbon dioxide is released from your blood and breathed out.

Oxygen is then taken by the blood to all the cells in your body.

Breathing, for the most part, is something our body does for us, with no planned effort on our part.

**COPD is an umbrella term used to describe the progressive lung diseases including: emphysema (em-fa-see-ma), chronic bronchitis (kron-ick-brawn-kie-tis), refractory (re-frac-ta-ree) asthma (az-ma) and some forms of bronchiectasis (brawn-key-eck-tay-sis). If you have COPD you have trouble moving air in and out of your lungs because of damage to the airways and/or the air sacs.*

Types of COPD

You have been told you have COPD. This stands for **C**hronic **O**bstructive **P**ulmonary **D**isease.

- Damage to the airways causes **chronic bronchitis**.
- Damage to the air sacs causes **emphysema**.
- Damaged and enlarged bronchial tubes causes **bronchiectasis.**

***C**hronic*: This means that the disease lasts a long time and is always present.

***O**bstructive*: Air flow in and out of your lungs is blocked or obstructed. This is caused by swelling and extra mucus in the tubes of the lungs which carry air in and out.

***P**ulmonary*: This means that the disease is located in your lungs.

***D**isease*: Your lungs have some damage. **But even though a cure hasn't been found yet, your symptoms can be treated.**

Chronic Bronchitis

Bronchitis occurs when the bronchial tubes are irritated and swollen. This causes coughing and shortness of breath. If mucus comes up with the cough and the cough lasts at least three months for two years in a row, the bronchitis has become **chronic bronchitis** *(kron-ick-brawn-kie-tis)*.

There are hair-like fibers along the inside edges of the bronchial tubes of the lungs. These tiny hairs are called **cilia**. The cilia help move mucus up the tubes so it can be coughed out. In chronic bronchitis, the tubes have lost their cilia. This makes it hard to cough up mucus, which causes more coughing. More coughing makes the tubes more irritated. This creates more mucus. The tubes then become swollen, making it hard to breathe. Smoking even just a little keeps the cilia from working normally. Mucus can build up in the lungs. This can cause more damage.

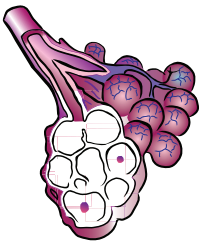
Symptoms of COPD

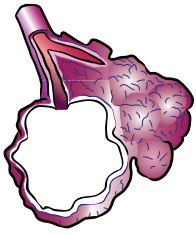
These can be different for each person, but the common symptoms are:

- *Shortness of breath*
- *A cough that won't go away and may produce mucus*
- *Feeling tired, especially when exercising or doing daily activities*
- *Tightness in the chest*

Emphysema

Emphysema *(em-fa-see-ma)* occurs when the air sacs in the lungs are destroyed. The sacs are called alveoli. The walls inside the sacs disappear. This makes the groups of small sacs become larger, single sacs. These larger sacs do not work as well as the smaller sacs. The larger sacs do not absorb oxygen as well. So, less oxygen is absorbed into the blood.

Normal 

Abnormal 

When the small air sacs become damaged, the lungs become stretched out. The lungs lose their springiness. The airways become flabby. It becomes hard to breathe out. Air is then trapped in the lungs. This creates a feeling of shortness of breath.

Asthma is NOT COPD.

With asthma, airflow is also blocked. But this blockage is ***reversible****. The blockage that occurs with COPD is NOT completely reversible. It is often partially reversible.*

Asthma and COPD are common diseases. As much as 20 percent of people with COPD also have asthma.

Bronchiectasis

Bronchiectasis *(brawn-key-eck-tay-sis)* is an abnormal stretching and widening of the lungs' airways. It is caused by mucus build-up. When the lungs cannot get rid of the mucus, it builds up in the airways. This causes infections in the airways. The airways become irritated and weak and start to widen. These weakened airways become damaged. All of this causes even more mucus and bacteria to build up. The airways become more infected and blocked. Breathing becomes difficult.

What Causes COPD?

Smoking

Most COPD is caused by breathing in unhealthy toxins or poisons. The most common toxin is cigarette smoke. **Smoking is the number one cause of COPD in the United States.** Smokers inhale over 4,000 chemicals. Over 40 of these cause cancer. When smoke enters the lungs, it causes irritation and inflammation. The body sends white blood cells to the area. The white blood cells release strong enzymes. These destroy lung tissue. Normally, the body can protect itself against these enzymes. But tobacco smoke can overwhelm these defenses. This causes the lung damage of COPD.

It is very important to quit smoking. Stopping smoking can slow down the progress of your COPD. It will also make your treatments more helpful. Within just a few weeks of stopping smoking, your breathing, coughing and clogged sinuses can improve. Other benefits of quitting include:

- Less risk of heart disease, lung disease and cancer
- Less shortness of breath
- More energy
- No smoker's cough
- Liver functions becomes normal
- Digestion becomes normal
- Healthier world for those who live with you
- Gives you more money
- Frees you from cigarette smells and burns

To Stop Smoking: Make a Plan

Set a date to quit.

Remove all cigarettes from your home and car.

Use nicotine gum or patches to help or get a prescription from your doctor for other medicines that can help.

Exercise and eat right.

Reward yourself with the money you save from not buying cigarettes.

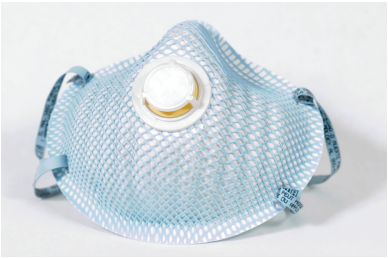
Get outside help and support: smokers quit lines, community and hospital sponsored programs and quitter's support groups.

Don't give up! Keep trying.

Breathing in Other Toxins

COPD can also be caused by breathing in dusts, fumes or chemicals over a long period of time. This usually occurs at work, but can also happen at home.

Harmful materials at work may include **ammonia** *(a-moan-yah)*, **asbestos** *(az-best-us)*, carbon monoxide, dusts and fumes. Toxins found at home can include dust, smoke, cleaners, spray products, mold and bacteria.



N-95 Dust Mask

Whether or not breathing these toxins caused your COPD, you should avoid them. Breathing in these harmful agents can make your lung disease and breathing problems much worse. Avoiding these harmful materials is called **reducing your risk**. There are many ways you can reduce your risk of making your lung disease worse.

Reducing your risks by avoiding harmful agents in your home:

Harmful Agent	Tips to Reduce Your Risk
Sprayed or "aerosolized" products: hair spray, perfume, deodorants, air fresheners	Use pump sprays and roll-on deodorants. Do not use plug-in air fresheners.
Cleaners and bug spray	Find less toxic, natural cleaners. Leave the home when cleaners or sprays are being used. Wear an N-95* respirator mask if you must use cleaners.
Dust and Dirt	Avoid shaking out rugs, vacuuming, sweeping and dusting. Have someone else do this cleaning if possible. Change filters in dryers, refrigerators, furnaces and heating vents often.
Wood-burning fireplace	Avoid using fireplaces.
Bacteria, mold and mildew	Avoid using or replace sponges often. Seal water leaks in the basement. Keep indoor humidity below 40 percent (use a humidity meter).

**An N-95 respirator mask is a mask that can filter out 95 percent of particles in the air if fitted and worn correctly.*

Air pollution can affect everyone. But breathing in smog is very bad for people with lung disease. Plan to stay indoors on days when there is a high level of pollution. (Your local news station usually reports the pollution level each day during the weather report.) Keep your windows closed on these days. Also, avoid breathing in bad fumes when traveling by car. You can do this by driving on less crowded roads and by avoiding busy rush hour times.

A Genetic Link to COPD

A disease called **Alpha-1-Antitrypsin** *(al-fa-one-an-tee-trip-sin)* **Deficiency** *(dee-fi-shin-see)* is known to cause COPD. People with Alpha-1 have a much lower-than-normal level of the blood protein called alpha-1-antitrypsin. This protein protects the lungs from irritation caused by breathing in toxins. Alpha-1 is a **genetic** *(ja-net-ick)* disorder. This means it is passed from parents to their children. You can find out if you have Alpha-1 through a simple blood test. Everyone with COPD should be tested for Alpha-1. This is very important because there is a specific treatment for Alpha-1. It can slow the progress of COPD. (For more information on Alpha-1-Antitrypsin Deficiency, visit the Alpha-1 Foundation's website at www.alpha-1foundation.org or AlphaNet at www.alphanet.org)

Links between COPD and Other Health Problems (Comorbidities)

Many people with COPD also have other medical problems. These can include:

- High blood pressure
- High cholesterol
- Heart disease
- Diabetes
- Osteoporosis
- Depression
- Cancer

These other conditions are called **comorbidities** *(coe-more-bid-i-tees)*. These problems can cause COPD patients to be in the hospital more often.

Why?

No one really knows why it is so common for COPD patients to have other serious medical problems. One reason may be the medicines that COPD patients must take. All medicines have side effects and risks. This is especially true for COPD medicines such as steroids. Another reason for these additional problems relates to the lung inflammation that occurs with COPD. People with COPD have inflammation in their lungs. AND they have some inflammation in their blood. Many experts believe that this blood inflammation causes some damage to the heart, muscles and bones of COPD patients. This would help explain the other medical problems. This thinking has lead to the idea that COPD is not just a disease of the lungs. It involves many parts of the body. **It is very important that you discuss other medical problems with your doctor so he/she can treat them as needed.** (For more information about comorbidities, see the COPD Foundation's *Big Fat Reference Guide®*, Chapter 2-B. The *Big Fat Reference Guide®* can be accessed at www.copdbfrg.org)

www.copdfoundation.org

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This Slim Skinny Reference Guide® (SSRG) was created by the COPD Foundation.

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