



A QUICK GUIDE ON

# Chronic Obstructive Pulmonary Disease



**U.S. Department of Health and Human Services**  
National Institutes of Health  
National Heart, Lung, and Blood Institute

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**COPD, or chronic obstructive pulmonary disease, is a serious lung disease that over time makes it hard to breathe.** Other names for COPD include chronic bronchitis or emphysema.

COPD, a leading cause of death, affects millions of Americans and causes long-term disability.

Most often, COPD occurs in people age 40 and over who...

- Have a history of smoking
- Have had long-term exposure to lung irritants such as air pollution, chemical fumes, or dust from the environment or workplace
- Have a rare genetic condition called alpha-1 antitrypsin (AAT) deficiency
- Have a combination of any of the above

### MAJOR COPD RISK FACTORS



## WHAT IS COPD?

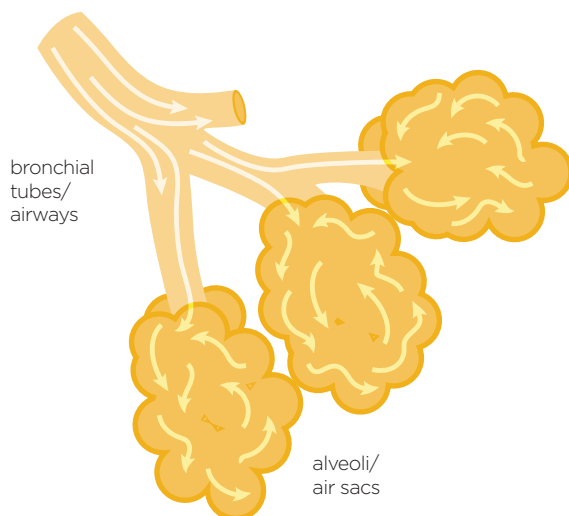


## To understand what COPD is, we first need to understand how respiration and the lungs work:

When air is breathed in, it goes down the windpipe into tubes in the lungs called bronchial tubes or airways. Within the lungs, bronchial tubes branch into thousands of smaller, thinner tubes called bronchioles. These tubes end in bunches of tiny round air sacs called alveoli.

Small blood vessels called capillaries run through the walls of the air sacs. When air reaches the air sacs, oxygen passes through the air sac walls into the blood in the capillaries. At the same time, carbon dioxide (the respiration waste gas) moves from the capillaries into the air sacs. This process is called **gas exchange**.

### GAS EXCHANGE IN A LUNG

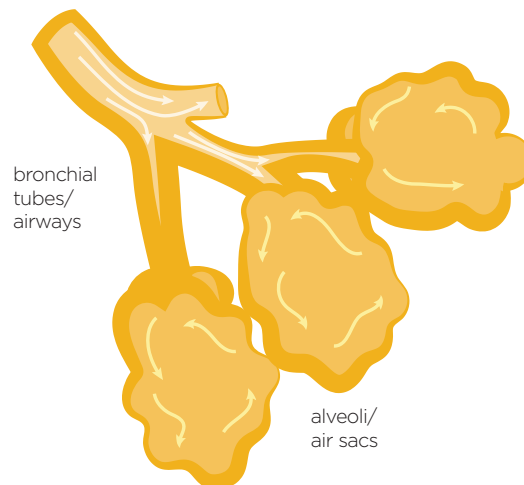


The airways and air sacs are elastic (stretchy). When breathing in, each air sac fills up with air like a small balloon. When breathing out, the air sacs deflate and the air goes out.

### In COPD, less air flows in and out of the airways because of one or more of the following:

- The airways and air sacs lose their elastic quality.
- The walls between many of the air sacs are destroyed.
- The walls of the airways become thick and inflamed.
- The airways make more mucus than usual, which can clog them.

### COPD DECREASES AIR FLOW AND GAS EXCHANGE IN THE LUNGS



## HOW DOES COPD AFFECT BREATHING?



**In emphysema**, the walls between many of the air sacs are damaged. As a result, the air sacs lose their shape and become floppy. This damage also can destroy the walls of the air sacs, leading to fewer and larger air sacs instead of many tiny ones. If this happens, the amount of gas exchange in the lungs is reduced.

**In chronic bronchitis**, the lining of the airways is constantly irritated and inflamed. This causes the lining to thicken. Lots of thick mucus forms in the airways, making it hard to breathe.

**Most people who have COPD have a variable combination of both emphysema and chronic bronchitis.** Thus, the general term “COPD” is more accurate.

Some people who have asthma can also develop COPD. Asthma is a chronic (long-term) lung disease that inflames and tightens the airways. Asthma treatments usually can reverse the inflammation and narrowing. However, in the presence of COPD, much of the reversibility is lost.



**At first, COPD may cause no symptoms or only mild symptoms.**

As the disease gets worse, symptoms usually become more severe. When symptoms are mild, they may not be noticed right away and people may adjust their lifestyle to make breathing easier. For example, taking the elevator instead of the stairs.

#### **COMMON SIGNS AND SYMPTOMS OF COPD INCLUDE:**



CONSTANT COUGH



SHORTNESS OF BREATH  
doing everyday activities



CAN'T BREATHE DEEP

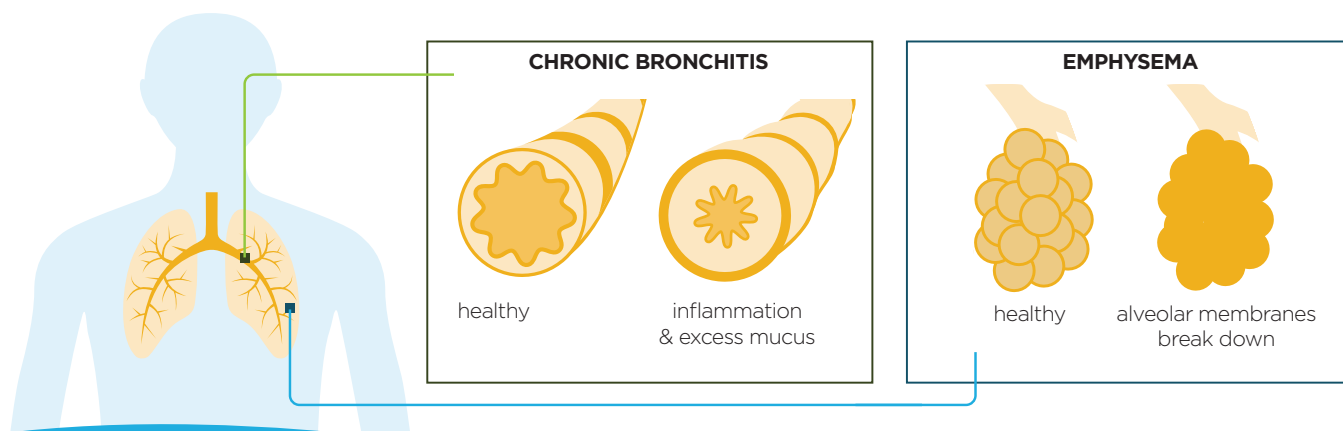


EXCESS SPUTUM



WHEEZING

### **CHRONIC OBSTRUCTIVE PULMONARY DISEASE**



## **COPD: EMPHYSEMA, CHRONIC BRONCHITIS, AND SYMPTOMS**





## COPD diagnosis is based on:

- **Signs and symptoms:** chronic cough, excess sputum
- **Personal and medical history:** smoking history or exposure to lung irritants, such as secondhand smoke, air pollution, chemical fumes, or dust
- **Test results:** lung function tests, spirometry

Lung function tests measure how much air is breathed in and out, how fast air is breathed out, and how well lungs deliver oxygen to the blood.

The main lung function test for COPD is spirometry but other tests, such as a lung diffusion capacity test, also might be used. Spirometry can detect COPD before symptoms become severe. It is a simple, non-invasive breathing test that measures the amount of air a person can blow out of the lungs (volume) and how fast he or she can blow it out (flow). The test helps detect COPD and its severity and can also find out whether other conditions, such as asthma or heart failure, are causing the symptoms.

### Other tests may include:

- Chest x-ray or chest CT scan
- Arterial blood gas test



There currently is no cure for COPD. Lifestyle changes and treatments can greatly improve a patient's quality of life and allow them to stay more active and slow the progression of the disease.

### Treatment options may include:

- Medications: bronchodilators, inhaled steroids, anti-inflammatory agents
- Pulmonary rehabilitation
- Physical activity training
- Oxygen supplementation
- Surgery

### Lifestyle changes may include:

- Avoiding lung irritants, such as smoke and pollutants
- Getting ongoing care, including:
  - Visiting a healthcare provider regularly
  - Taking medications as directed
  - Getting flu (influenza), pneumococcal, and COVID-19 vaccines as recommended by a healthcare provider
- Monitoring activities and symptoms
- Preparing for disease flare-ups



# COPD: DIAGNOSIS AND TREATMENT OPTIONS

For more information and resources, visit the National Heart, Lung, and Blood Institute's ***Learn More Breathe Better***<sup>®</sup> website at [\*\*COPD.nhlbi.nih.gov\*\*](https://COPD.nhlbi.nih.gov).



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