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Patient information: Chronic obstructive pulmonary disease (COPD), including emphysema (Beyond the Basics)

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COPD OVERVIEW

COPD, or chronic obstructive pulmonary disease, is a condition in which the airways in the lungs become broken down and narrowed, often due to smoking cigarettes. Sometimes the air sacs are also damaged. As the lungs become more damaged over time, it becomes increasingly difficult to breathe through the narrowed airways (also known as bronchial tubes). When the damage is severe, it may also become difficult to get enough oxygen into the blood and to get rid of excess carbon dioxide. These changes all lead to shortness of breath and other symptoms. Unfortunately, the symptoms of COPD cannot be completely eliminated with treatment and the condition usually worsens over time.

The term COPD is often used interchangeably with the terms chronic bronchitis and emphysema because chronic bronchitis and emphysema are the most common forms of COPD. Also, the current treatments for COPD, chronic bronchitis, and emphysema are similar. In the discussion that follows, chronic bronchitis and emphysema are referred to collectively as COPD.

This article reviews the risk factors, symptoms, and tests used to diagnose COPD. An article that discusses treatment of COPD is available separately. (See "[Patient information: Chronic obstructive pulmonary disease \(COPD\) treatments \(Beyond the Basics\)](#)".)

COPD CAUSES

To understand why COPD develops, it is important to understand how the lungs work. Normally, air that we breathe passes from the nose and mouth through the airways to the tiny air sacs of the lung, called alveoli. In the air sacs, oxygen that we breathe passes through the walls of air sacs into the bloodstream ([figure 1](#)). Carbon dioxide passes in the reverse direction, out of the bloodstream, back into the alveoli, and is then eliminated by breathing out ([figure 2](#)). Carbon dioxide is a waste product of the body's metabolism, and must be regularly removed.

In people who develop COPD, irritating gases and particles are inhaled while smoking or breathing smoke filled air (secondhand smoke) or other fumes or particles. These gases and particles can injure the airways and lungs and cause swelling (inflammation). Over time, the inflammation becomes chronic, damages the lung tissue, and may cause scarring ([figure 3](#)). This lung damage makes it more difficult to breathe in and out and makes it harder for oxygen and carbon dioxide to pass across the walls of the air sacs. (See "[Chronic obstructive pulmonary disease: Definition, clinical manifestations, diagnosis, and staging](#)".)

Reasons for airflow blockage — Any disease that interferes with airflow out of the lungs can cause COPD. Most people with COPD have chronic bronchitis and emphysema, and some also have asthma.

Chronic bronchitis — Chronic bronchitis is the term used to describe people who have a chronic cough that produces sputum. Chronic bronchitis can scar the airways and reduce airflow.

Emphysema — Emphysema is the term used to describe damage to the air sacs in the lung. This damage can also restrict airflow.

Asthma — Asthma is a chronic inflammatory disorder of the airways. The chronic inflammation leads to recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. Treatment is usually successful in reversing inflammation and airway narrowing. In a minority of people with asthma, the chronic inflammation permanently restricts airflow. When this airway narrowing cannot be completely reversed with treatment, the person is said to have COPD.

COPD RISK FACTORS

Smoking cigarettes significantly increases the risk of developing COPD. However, approximately 20 percent of people who develop COPD have never smoked.

Other factors that increase the risk of developing COPD include an abnormal sensitivity and exaggerated response to inhaled substances (called airway responsiveness), other exposures, such as secondhand exposure to smoke and workplace exposure to environmental dust or organic materials, or exposure to air pollution. COPD can run in families. (See "[Chronic obstructive pulmonary disease: Risk factors and risk reduction](#)".)

Genetic risk factors for COPD include severe deficiency of alpha-1 antitrypsin, a protein that protects the lungs. (See "[Alpha-1 antitrypsin deficiency](#)" below.)

COPD SYMPTOMS

COPD usually causes no or mild symptoms at first. As the disease progresses, symptoms usually worsen. The most common symptoms include:

- Coughing and spitting up phlegm (mucus)
- Wheezing (a whistling or squeaking noise as you breathe)
- Shortness of breath with activity or even at rest
- Fatigue
- Morning headaches

COPD DIAGNOSIS

If you have shortness of breath, a chronic cough, or cough up phlegm, your healthcare provider may recommend testing for COPD. The test used to diagnose COPD is a type of a pulmonary (lung) function test (PFT). (See "[Chronic obstructive pulmonary disease: Definition, clinical manifestations, diagnosis, and staging](#)".)

Pulmonary function tests (PFTs) — The pulmonary function test (PFT) that measures airway obstruction is called spirometry, and is the best test for diagnosing COPD. Spirometry can detect COPD even in people who do not yet have symptoms.

