Pulmonary Emphysema

What is pulmonary emphysema?
Emphysema is a chronic lung condition in which alveoli, or air sacs, may be:

- destroyed
- narrowed
- collapsed
- stretched
- over-inflated

Over-inflation of the air-sacs is a result of a breakdown of the walls of the alveoli, and causes a decrease in respiratory function and breathlessness. Damage to the air sacs is irreversible and results in permanent "holes" in the tissues of the lower lungs.

What are the symptoms of pulmonary emphysema?
The following are the most common symptoms for pulmonary emphysema. However, each individual may experience symptoms differently.

Early symptoms of pulmonary emphysema may include:

- shortness of breath
- cough

Other symptoms may include:

- fatigue
- anxiety
- sleep problems
- heart problems
- weight loss
- depression

The symptoms of pulmonary emphysema may resemble other lung conditions or medical problems. Consult your physician for a diagnosis.

What are the causes of pulmonary emphysema?
Emphysema does not develop suddenly, but occurs very gradually. The lung has a system of elastic fibers that allow the lungs to expand and contract. Pulmonary emphysema occurs when a breakdown in the chemical balance that protects the lungs against the destruction of the elastic fibers occurs.

There are a number of reasons for the breakdown in chemical balance:

- smoking
- exposure to air pollution
- irritating fumes and dusts on the job
- a rare, inherited form of the disease called alpha 1-antitrypsin (AAT) deficiency-related pulmonary emphysema, or early onset pulmonary emphysema
How is pulmonary emphysema diagnosed?
In addition to a complete medical history and physical examination, the physician may request the following:

- **pulmonary function tests** - diagnostic tests that help to measure the lungs’ ability to exchange oxygen and carbon dioxide appropriately. The tests are usually performed with special machines that the person must breathe into, and may include the following:
  - **spirometry** - a spirometer is a device used by your physician that assesses lung function. Spirometry, the evaluation of lung function with a spirometer, is one of the simplest, most common pulmonary function tests and may be necessary for any/all of the following reasons:
    - to determine how well the lungs receive, hold, and utilize air
    - to monitor a lung disease
    - to monitor the effectiveness of treatment
    - to determine whether the lung disease is restrictive (decreased airflow) or obstructive (disruption of airflow)
  - **peak flow monitoring (PFM)** - a device used to measure the fastest speed in which a person can blow air out of the lungs. During an asthma or other respiratory flare up, the large airways in the lungs slowly begin to narrow. This will slow the speed of air leaving the lungs and can be measured by a PFM. This measurement is very important in evaluating how well or how poorly the disease is being controlled.
- **blood tests** - to analyze the amount of carbon dioxide and oxygen in the blood.
- **chest x-ray** - a diagnostic test which uses invisible electromagnetic energy beams to produce images of internal tissues, bones, and organs onto film.
- **sputum culture** - a diagnostic test performed on the material that is coughed up from the lungs and into the mouth. A sputum culture is often performed to determine if an infection is present.
- **electrocardiogram (ECG or EKG)** - a test that records the electrical activity of the heart, shows abnormal rhythms (arrhythmias or dysrhythmias), and detects heart muscle damage.

Treatment for pulmonary emphysema:
Specific treatment for pulmonary emphysema will be determined by your physician based on:

- your age, overall health, and medical history
- extent of the disease
- your tolerance for specific medications, procedures, or therapies
- expectations for the course of the disease
- your opinion or preference

The goal of treatment for people with pulmonary emphysema is to live more comfortably with the disease by providing relief of symptoms and preventing progression of the disease with minimal side effects.

Treatment may include:

- quitting smoking - the single most important factor for maintaining healthy lungs
- antibiotics for bacterial infections
- oral medications
- bronchodilators and other inhaled medications
- exercise - including breathing exercises to strengthen the muscles used in breathing as part of a pulmonary rehabilitation program to condition the rest of the body
- oxygen supplementation from portable containers
- lung reduction surgery to remove damaged area of the lung
- lung transplantation
What is Chronic Obstructive Pulmonary Disease (COPD)?

COPD is a term that refers to a large group of lung diseases which can interfere with normal breathing. It is estimated that nearly 16 million Americans have COPD. The two most common conditions of COPD are chronic bronchitis and emphysema.

The causes of COPD are not fully understood. It is generally agreed that the most important cause of chronic bronchitis and emphysema is cigarette smoking. Causes such as air pollution and occupational exposures may play a role, especially when combined with cigarette smoking. Heredity also plays a contributing role in some patients’ emphysema, and is especially important in a rare form - due to alpha 1 anti-trypsin deficiency.

Patients with chronic bronchitis usually have a cough and sputum production for many years before they develop shortness of breath.

Patients with emphysema usually have shortness of breath and develop a cough and sputum during a respiratory infection, or in the later stages of the illness.