Emphysema

Summary

- Emphysema is a type of lung disease that causes breathlessness.
- Emphysema is usually caused by cigarette smoking.
- There is no cure, but the condition can be managed using medications and adjustments to lifestyle.
- If you or someone near to you has shortness of breath or a long-term productive cough, see your doctor for a lung function test.

Emphysema and another lung condition known as chronic bronchitis (persistent cough with phlegm) are both features of a common lung disease called chronic obstructive pulmonary disease (COPD).

Emphysema is generally caused by cigarette smoking or long-term exposure to certain industrial pollutants or dusts. A small percentage of cases are caused by a familial or genetic disorder, alpha-1-antitrypsin deficiency. While damaged airways don't regenerate and there is no cure, emphysema is preventable and treatable.

Symptoms of emphysema

The symptoms of emphysema include:

- breathlessness with exertion, and eventually breathlessness all the time in advanced disease
- susceptibility to chest infections
- cough and phlegm production
- fatigue
- barrel-shaped chest (from expansion of the ribcage in order to accommodate enlarged lungs)
- cyanosis (a blue tinge to the skin) due to lack of oxygen.

Structure of the lungs

The lungs are sponge-like structures that lie within the chest, protected by the ribcage. They are made up of progressively branching air passages, the smallest of which end in minute air sacs, where inhaled oxygen is transferred to the blood stream and carbon dioxide (produced in many of the body's chemical reactions) is transferred from the blood into the exhaled breath.

Inhaled air is directed down the trachea (windpipe), which divides into two passages called bronchi and they distribute the inhaled air, one to each lung. The bronchi divide into smaller tubes called bronchioles, and further still into tiny air sacs called alveoli. Each alveolus is encased by a fine mesh of capillaries, through which the exchange of oxygen and carbon dioxide takes place.

Oxygen molecules dissolve and move across a thin film of moisture from the air sac to the bloodstream. Blood carrying oxygen travels to the heart and is then pumped around the body. At the same time, carbon dioxide in the blood crosses from the capillaries to the air sacs, using the same film of moisture. The carbon dioxide leaves the body within the exhaled breath.

Damaged airways and lungs

After repeated exposure to chemical irritants, such as cigarette smoke, the air passages and air sacs of the lungs become inflamed and damaged. The airways of healthy lungs have elastic properties. However, with continuing irritant exposure, they lose their elasticity as airway walls become swollen and thickened, narrowing the lumen.

If chronic bronchitis is also present, the vast amounts of mucus can contribute to narrowing of the air passages and can clog the air sacs, further reducing their ability to function. As the number of functional air sacs reduces, the
number of capillaries servicing the damaged alveoli also gradually reduces.

These changes result in partial obstruction of the passages carrying inhaled and exhaled breath, and reduced capacity for the lungs to extract the oxygen from inhaled air, so that the person has to breathe harder to get sufficient amounts of oxygen.

**Complications of emphysema**

Complications of emphysema can include:

- Pneumonia – this is an infection of the alveoli and bronchioles. A person with emphysema is more prone to pneumonia.
- Collapsed lung – some lungs develop large air pockets (bullae), which may burst, resulting in lung deflation (also called pneumothorax).
- Heart problems – damaged alveoli, reduced number of capillaries and lower oxygen levels in the bloodstream may mean that the heart has to pump strongly to move blood through the lungs. Over time, this can place considerable strain on the heart.

**Diagnosis of emphysema**

COPD, including emphysema, is diagnosed mainly using a lung function test called spirometry. Other tests may help in diagnosis of emphysema including:

- other lung function (or breathing) tests
- chest x-rays
- CT scans.

**Treatment for emphysema**

There is no cure for emphysema, although it is treatable. Appropriate management has been shown to reduce symptoms, improve quality of life and help people stay out of hospital.

Management includes:

- smoking cessation (immediate and complete smoking cessation is the most effective treatment for COPD and emphysema) and avoidance of other air pollutants
- respiratory (pulmonary) rehabilitation programs
- oxygen treatment, in advanced cases
- anti-inflammatory medications, medicine to widen the airways (bronchodilators) and loosen the phlegm, and antibiotics
- stress management techniques
- gentle, regular exercise to improve overall fitness
- influenza vaccination (yearly) and pneumococcal vaccination to protect against certain types of respiratory infection.

**Respiratory rehabilitation programs**

A person with emphysema can take part in a respiratory rehabilitation program, commonly known as ‘pulmonary rehab’. These programs:

- provide information and education on emphysema
- introduce people to an exercise program proven to improve emphysema symptoms
- improve lung function through specific breathing exercises
- teach stress management techniques
- offer advice on adapting to life with emphysema
- provide emotional support through shared experiences.

To find out about a program near you, call the Lung Foundation Australia on 1800 654 301.

**Oxygen treatment for emphysema**
If a person with emphysema is found to have exceptionally low levels of oxygen in their blood, they will be given oxygen to use at home. The oxygen is usually breathed through the nose via nasal prongs (cannulae). The person will need to use the oxygen treatment for at least 16 hours every day.

Where to get help
- Your doctor
- Lung Foundation Australia Tel. 1800 654 301

Things to remember
- Emphysema is a type of lung disease that causes breathlessness.
- Emphysema is usually caused by cigarette smoking.
- There is no cure, but the condition can be managed using medications and adjustments to lifestyle.
- If you or someone near to you has shortness of breath or a long-term productive cough, see your doctor for a lung function test.

This page has been produced in consultation with and approved by:
Lung Foundation Australia