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 most of the time in advanced disease
- susceptibility to chest infections
- cough with 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 largest of these is the windpipe (trachea), which divides into the two bronchi, which divide into the smaller bronchioles.

Bronchioles end in minute air sacs (alveoli), where inhaled oxygen is transferred to the blood stream and carbon dioxide is transferred from the blood into the exhaled breath. This exchange of oxygen and carbon dioxide takes place via a fine mesh of capillaries.

### 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, but in lungs that are repeatedly exposed to irritants, the airways lose their elasticity and become thickened and swollen. This swelling means that the passageway for air becomes narrower.

If the same person also has chronic bronchitis (ongoing inflammation of the lining of the bronchial tubes), the mucus present can further contribute to narrowing of the air passages and clogging of 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 blockage of the passages carrying inhaled and exhaled breath
- reduced capacity for the lungs to extract the oxygen from inhaled air.

This means that the person has to breathe harder to get enough oxygen.

**Complications of emphysema**

Complications of emphysema can include:

- **pneumonia** – this is an infection of the alveoli and bronchioles. People with emphysema are 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 blood stream may mean that the heart has to pump harder to move blood through the lungs. Over time, this can place considerable strain on the heart.

**Diagnosis of emphysema**

Chronic obstructive pulmonary disease, including emphysema, is diagnosed mainly using a lung function test called spirometry. Other tests that may help in diagnosis of emphysema include:

- 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 can reduce symptoms, improve your quality of life and help you stay out of hospital.

Management includes:

- stopping smoking immediately and completely – this is the most effective treatment for COPD and emphysema
- avoiding other air pollutants
- respiratory (pulmonary) rehabilitation programs
- oxygen treatment, in advanced cases
- medications such as
  - anti-inflammatory medications
  - medicine to widen the airways (bronchodilators) and loosen the phlegm
  - 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 a supervised exercise program proven to improve emphysema symptoms
- improve lung function through specific breathing exercises
- teach stress management techniques

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• offer advice on adapting to life with emphysema
• provide emotional support through shared experiences.

To find out about a program near you, call 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 **GP (doctor)**
- **Lung Foundation Australia** Tel. **1800 654 301**
- **QUITline** Tel. **13 78 48**