

## **Chronic obstructive pulmonary disease**

Chronic obstructive pulmonary disease (COPD) is an umbrella term for a number of lung diseases that prevent proper breathing.

Three of the most common COPD conditions are emphysema, chronic bronchitis and chronic asthma that isn't fully reversible. These conditions can occur separately or together.

The main symptoms of COPD are breathlessness, chronic cough and sputum (mucus or phlegm) production. Cigarette smokers and ex-smokers are most at risk of COPD.

There is no cure for COPD, and the damaged airways don't regenerate. However, there are things you can do to slow progress of the disease, improve your symptoms, stay out of hospital and live longer.

### **Symptoms of chronic obstructive pulmonary disease**

Symptoms of COPD include:

- breathlessness after exertion
- in severe cases, breathlessness on minimal exertion or even at rest
- wheezing
- coughing
- coughing up sputum (mucus or phlegm)
- fatigue
- cyanosis – a blue tinge to the skin caused by insufficient oxygen
- increased susceptibility to chest infections.

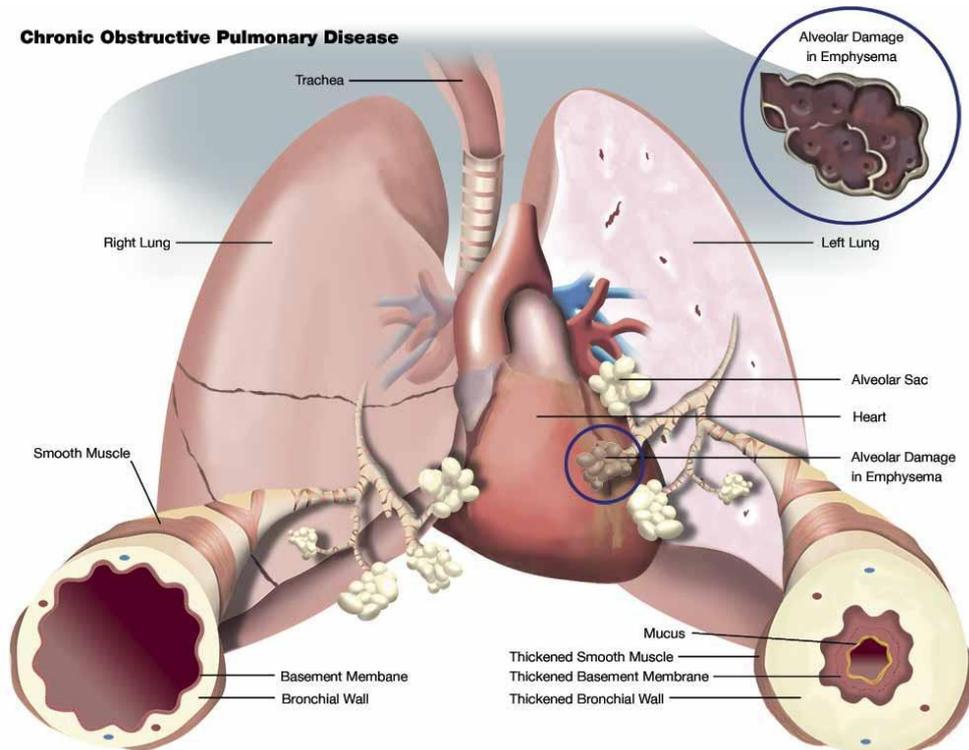
### **The structure of the lungs**

The lungs are spongy lobes inside the chest, protected by the ribcage. Inhaled air is directed down the trachea (windpipe) into two tubes (bronchi) that each service a lung. The bronchi divide into smaller tubes called bronchioles, and further still into tiny air sacs called alveoli.

Each alveolus has a fine mesh of capillaries where the exchange of oxygen and carbon dioxide takes place. Oxygen molecules dissolve and migrate across a thin film of moisture from the air sac to the bloodstream. Oxygenated blood is sent to the heart and 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 is then breathed out.

## Chronic Obstructive Pulmonary Disease



### How COPD affects lung function

People with emphysema have damaged alveoli and bronchi. The weakened and ruptured air sacs are unable to efficiently move oxygen from the air to the blood. As the disease progresses and damages more air sacs, you may eventually feel breathless even when you are resting.

Bronchitis means inflammation of the bronchi. The lungs normally produce a small amount of fluid to keep healthy, but chronic bronchitis causes an overproduction of fluid. This leads to frequent and productive coughing (producing mucus or phlegm).

Typically, COPD develops so slowly that you don't realise your ability to breathe is gradually becoming impaired. The damage done to the lungs can be considerable before the symptoms are severe enough to notice.

### Complications of COPD

If you have COPD you are at increased risk of a number of complications, including:

- chest infections – a common cold can easily lead to a severe infection
- **pneumonia** – a lung infection that targets the alveoli and bronchioles

- collapsed lung – the lung may develop an air pocket. If the air pocket bursts during a coughing fit, the lung will deflate
- heart problems – the heart has to work extremely hard to pump blood through the damaged lungs
- **osteoporosis** – where bones become thin and break more easily. Steroid use in people with COPD is thought to contribute to osteoporosis
- anxiety and depression – breathlessness or the fear of breathlessness can often lead to feelings of anxiety and depression
- oedema (**fluid retention**) – problems with blood circulation can cause fluid to pool, particularly in the feet and ankles
- hypoxaemia – caused by lack of oxygen to the brain. Symptoms include cognitive difficulties such as confusion, memory lapses and depression
- risks of sedentary lifestyle – as symptoms of COPD progress, many people adjust their lifestyle to avoid symptoms. For example, they reduce their physical activity to avoid breathlessness. As they reduce their physical activity, they become less fit and even more breathless on exertion. This downward spiral of inactivity means they are prone to a range of potentially serious health problems, such as obesity and cardiovascular disease.

### **Causes and risk factors of COPD**

Some of the causes and risk factors of COPD include:

- cigarette **smoking** – the most significant risk factor. Around 20 to 25 per cent of smokers will develop COPD. Ex-smokers remain at risk and should be aware of symptoms of breathlessness
- long-term exposure to lung irritants – such as chemical vapours or dust from grain or wood. Severe air pollution can make COPD worse in smokers
- genes – a genetic disorder known as alpha-1-antitrypsin deficiency can trigger emphysema, even if no other risk factors are present.

### **Diagnosis of COPD**

The diagnosis of COPD is based on a breathing test called spirometry. This can be done in a general practice surgery, specialised laboratory or by a specialist. Other tests that may also be carried out include:

- physical examination
- medical history
- gas transfer and lung volume tests
- blood tests

- sputum analysis
- chest x-ray
- computed tomography (CT) scan.

## **Treatment for COPD**

There is no cure for COPD, and the damaged lung tissue doesn't repair itself. However, there are things you can do to slow the progression of the disease, improve your symptoms, stay out of hospital and live longer.

Treatment may include:

- bronchodilator medication – to open the airways. This medication is best administered by a puffer
- corticosteroids – medication to reduce inflammation and swelling of lung tissue. This is usually given by a puffer to minimise the risk of side effects
- expectorants – medication to loosen the phlegm and make it easier to cough up
- oxygen therapy – is prescribed for many people with chronic lung disease who have low blood oxygen levels. The body can tolerate low levels of oxygen for short periods of time, but low levels of oxygen for long periods of time can cause problems in your vital organs. Home oxygen therapy helps return your blood oxygen levels to normal, reducing the damage to your vital organs. Oxygen therapy is usually prescribed to prolong life and it may also improve quality of life. While the use of oxygen may relieve shortness of breath, in many cases, it does not
- treatment for chest infections – such as antibiotics to treat existing infections, and pneumonia and flu vaccinations to reduce the risk of infections in the future
- pulmonary rehabilitation – these programs consist of an individual assessment followed by supervised exercise training and education. Programs usually run for about eight weeks and at the end of the program, there is normally re-assessment and referral to an ongoing maintenance exercise program such as **Lungs in Action** (where available)
- surgery – a technique called lung volume reduction surgery is a possible option for a small number of people with COPD. Affected portions of diseased lung tissue are surgically removed, which allows the healthier tissue to better expand and contract. Another possible technique involves insertion of endobronchial valves to achieve lung volume reduction
- ongoing monitoring – a person with COPD needs regular medical check-ups.

## **Lifestyle factors for COPD**

If you have COPD it can help to make a number of important lifestyle changes, including:

- **quitting smoking** – techniques can include ‘cold turkey’, counselling, nicotine replacement therapy and medications that work on brain receptors. Evidence shows that counselling, together with medical therapy, is most effective
- being as physically active as possible. If possible, attend pulmonary rehabilitation
- following a **COPD action plan**
- eating a **healthy diet**
- making adjustments to your lifestyle and home environment to ensure plenty of rest
- keeping adequately **hydrated** to help keep the mucus in your lungs runny and easier to cough up
- avoiding smoky or dusty environments