

Chronic obstructive pulmonary disease (COPD)

Chronic obstructive pulmonary disease (COPD) is the name for a group of lung diseases including chronic *bronchitis*, *emphysema* and *chronic obstructive airways disease*. The main symptom of COPD is an inability to breathe in and out properly. After pneumonia, COPD is the leading cause of respiratory death in Ireland.

According to the Irish Thoracic Society, 440,000 people in Ireland suffer from COPD. It usually affects people who are over 40 years of age. It is more common in men than women. Smoking is the cause of 90% of COPD cases in developed countries. The World Health Organisation predicts that by 2020, COPD will be the third commonest cause of death worldwide, causing more deaths than lung cancer, heart disease and stroke. This is due to two reasons; firstly there is an increase in tobacco consumption in underdeveloped countries. Secondly, even though tobacco consumption is falling in developed countries, the ageing population is leading to more cases of COPD.

Types

Chronic bronchitis: bronchitis means 'inflammation of the bronchi'. These are the tubes or airways which carry oxygen from the air through the lungs. This inflammation increases mucus production in the airways, producing phlegm which causes a cough.

Emphysema: this is where the alveoli (air sacs) in the lungs lose their elasticity. This reduces the support of the airways, causing them to narrow. It also means the lungs are not as good at getting oxygen into the body, so the patient has to breathe harder. This can result in shortness of breath.

The effects of COPD

The condition builds up over a number of years, causing the airways of the lungs (bronchioles) to narrow, permanently damaging the air sacs (alveoli). COPD is the result of a chronic inflammatory response in the large airways (chronic bronchitis), the small airways (bronchiolitis) and the lung (emphysema).

The patient finds it hard to do normal activities, such as walking up the stairs. If not enough oxygen is getting through the narrowed airways to the heart, the patient may also be at risk of heart failure. The symptoms of COPD can seem similar to those of asthma. Asthma can be controlled with treatment but COPD causes permanent damage to the lungs. Treatment for COPD usually involves relieving the symptoms; for example, by using an inhaler to make breathing easier.



Symptoms

COPD does not usually become noticeable until after the age of 40. Symptoms include early morning smokers cough, persistent coughing, mucus and phlegm, wheezing, tight chest, difficulty breathing, shortness of breath, and repeated lung and chest infections. The symptoms are often worse in winter. It is common for sufferers of COPD to have two or more chest infections a years when the symptoms are worse than normal.

Because the amount of oxygen reaching the heart and muscles is diminished, COPD can make patients feel tired. This can affect the ability to work and exercise and with severe COPD even simple tasks can become difficult.

Many COPD suffers experience weight loss as having difficulty breathing can lead to the patient using up a lot more energy and reduce appetite. Not everyone with COPD experiences weight loss and in fact obesity makes COPD worse.

First signs of COPD

A patient should be referred to their GP when they experience the following symptoms which are the first signs of COPD. **1.** An increasing breathlessness when exercising, or moving around. **2.** A persistent cough with phlegm that never seems to go away. **3.** Frequent chest infections, particularly in winter.

Causes

Smoking is the main cause. The risk of COPD increases the more the patient smokes and the longer they smoke. Less common causes of COPD include passive smoking, pollution, fumes and dust, and being born more susceptible to the condition (genetic link).

Diagnosis

The diagnosis of COPD is made from the presence of symptoms including shortness of breath (persistent and progressive), cough, sputum, wheeze (particularly early morning) and exercise intolerance.

Common signs are increase in chest size, quiet breath sounds or rhonchi (rattling sound when breathing) and build up of fluid. Tests must be done to eliminate other conditions such as asthma. Tests include spirometry which involves blowing into and out of a tube called a spirometer; this determines if the airways have narrowed. Chest x-rays determine if there is an expansion of the lungs which can point to COPD. A CT scan can give a more definitive diagnosis of different lung diseases than a chest x-ray. Blood tests can determine how much oxygen is in the blood which can help make a diagnosis.

Treatment

Short-acting bronchodilator inhalers

Short-acting bronchodilator inhalers deliver a small dose of medicine directly to the lungs, causing the muscles in your airways to relax and open up.

There are two types. The first type are beta-2 agonist inhalers, such as salbutamol (Ventolin[®], Salamol[®]) and terbutaline (Bricanyl[®]), and the second type are anti-cholinergic inhalers, such as ipratropium (Atrovent[®]). For people with mild COPD symptoms, one bronchodilator inhaler used as needed when breathless may be sufficient to relieve the symptoms. It can be necessary to use one of each type of bronchodilator, a beta-2 agonist and an anti-cholinergic inhaler, four times a day.

Long-acting bronchodilator inhalers

If a short-acting bronchodilator inhaler does not help to relieve symptoms, a long-acting bronchodilator inhaler may also be used. These work in a similar way to the short-acting bronchodilators, but each dose lasts for at least 12 hours. There are two types of long-acting bronchodilator inhalers. The first type is beta-2 agonist inhalers, such as salmeterol (Serevent[®]) and the second type is anti-cholinergic inhalers, such as tiotropium (Spiriva[®]).

Corticosteroid inhalers

Corticosteroid inhalers reduce the inflammation in the airways. If a patient with moderate or severe COPD is not getting adequate relief from bronchodilator inhalers, a GP may prescribe a corticosteroid inhaler. If a patient with moderate or severe COPD is not getting adequate relief from bronchodilator inhalers, a GP may do a four-week trial using a long-acting bronchodilator and a corticosteroid inhaler. The trial will only be continued if it helps to control the symptoms. However, they do not slow down the progression of the disease. With severe COPD, the GP may recommend that a corticosteroid inhaler without having a four-week trial. This is because there is some evidence to suggest that corticosteroids prevent flare-ups in those with very severe COPD. There are several types of corticosteroid inhalers including beclometasone (eg. Beclazone[®], Becotide[®]), budesonide (eg. Pulmicort[®]) and fluticasone (eg. Flixotide[®]). Combination inhalers containing both bronchodilators and corticosteroids are often prescribed (eg.) Seretide[®] Diskhaler, Symbicort[®] Turbohaler.

Other medication

Theophylline tablets

Theophylline causes the muscles of the airways to relax and open up. Theophylline increases the strength of the diaphragm (the large muscle at the base of the chest that is used when breathing) and speeds up the clearance of mucus and phlegm from the lungs. This helps the patient to breathe more easily. Before taking theophylline tablets, a blood sample must be taken. This is due to the risk of potential side effects, including increased heart rate and palpitations, headaches, nausea and other gastrointestinal problems and insomnia.



Theophylline is used less regularly nowadays because of the risk of side effects.

Mucolytic tablets or capsules

Mucolytics, such as carbocisteine, make the mucus and phlegm in the throat thinner and easier to cough up. They are particularly beneficial for people with moderate and severe COPD, who have frequent flare-ups. (Eg) Viscolex[®], Exputex[®], Erdotin[®] caps.

Antibiotics and steroid tablets

Patients with COPD often suffer from chest infections so doctors may prescribe a course of broad spectrum antibiotics (eg) amoxicillin, tetracycline, erythromycin.

Steroid tablets may also be prescribed as a short course for one or two weeks when there is a bad flare-up. They work best if they're taken as the flare-up starts. Long term use of steroids cause side effects including weight gain, osteoporosis, stomach ulcers and fluid retention. Side effects are minimal for short term courses. They should be taken as a single dose in the morning and after food. Enteric coated versions such as Deltacortil[®] reduce stomach irritation.

Nebulisers

A nebuliser can be used for severe cases of COPD. A nebuliser is a machine that administers medicine through a mouthpiece or a face mask.

Other types of treatment

Long-term oxygen therapy

In extreme cases of COPD, when the oxygen in the blood is low, the patient may need to take oxygen from an electronically operated oxygen concentrator through nasal tubes or through a mask.

Hospitalisation

In rare cases, hospitalisation may be necessary during a particularly severe attack. In hospital, patients usually receive oxygen, antibiotics (if necessary) and a nebuliser to help ease symptoms.

Lung transplantation

Lung transplantation is rare in cases of COPD and it is usually only suggested if life expectancy is less than two years.

Lung volume reduction surgery (LVRS)

Lung volume reduction surgery (LVRS) is when the damaged parts of the lung are removed during surgery. This can improve symptoms, but may put the patient at increased risk of catching pneumonia or developing an air leak where the lung is re-sealed.



Preventing COPD

Give up smoking

Not smoking is the best way to prevent COPD. Quitting can slow down the progress of the condition. If symptoms of COPD are mild, stopping smoking may be all that is needed to significantly improve them. It is important to avoid other people's smoke (passive smoking).

Get regular exercise

Regular exercise will help to strengthen the heart and lungs, and improve breathing. Build up gradually if not used to exercising. The aim is to do a minimum of 30 minutes of exercise a day, at least five times a week. Losing weight can also be beneficial as extra weight can make breathlessness worse.

Eat a balanced diet

Eating a healthy, balanced diet is very important for keeping the immune system strong and healthy. Eat plenty of fruit and vegetables (at least five portions a day) and reduce the amount of fat, sugar and salt, in the diet.

Drink plenty of fluids

Drink plenty of fluids, particularly water, to help to reduce the amount of mucus and phlegm in the throat and lungs.

Use a steam inhalator or humidifier

A steam inhalator or humidifier can be used at home to reduce excess phlegm.

Physiotherapy

Physiotherapy can help to clear excess mucus and phlegm. A physiotherapist will be able to teach exercises to do at home, such as arm exercises.

Get vaccinated

Patients with COPD are at greater risk of catching other illnesses, such as influenza (flu). They should therefore have an annual flu jab every autumn (September to November). A vaccination against pneumococcus (a bacterium that can cause serious chest infections) is also recommended, as a one-off injection. Protection from the pneumococcus vaccine lasts for 5 years or longer.

COPD and flying

Before flying, the patient should check with their GP to ensure they feel they are fit to fly. Before travelling, remember to pack all medication, such as inhalers, in hand luggage. A letter from a doctor or pharmacist explaining why the medication is needed is advised. Patients using oxygen therapy should inform the travel operator and airline before booking a holiday, as a medical form may be needed from their GP. If using long-term oxygen therapy, ensure adequate oxygen supply for the trip.