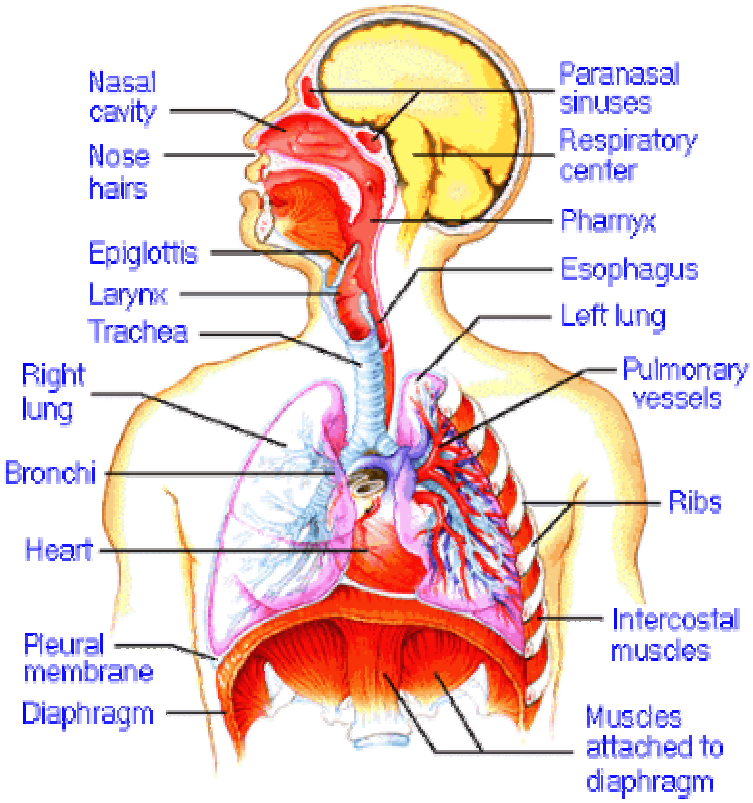
COPD (Chronic Obstructive Pulmonary Disease)

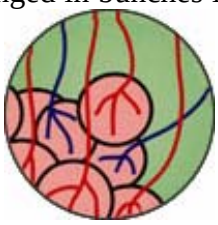
A difficult problem explained in simple language.



INTRODUCTION

So you want to find out more about the illness that we call COPD. It may be that your doctor has raised some concerns that you might have this condition but has not had a chance to explain what it is. You may have seen something in the press about COPD which describes symptoms that you have been getting such as cough, phlegm and breathlessness or you may have a loved one who is developing these symptoms and you are concerned to find out what the cause is. Make sure you read all the way through to the end of this description and we hope that you will have a much better understanding.

The normal lung.

As we travel through the voice box (larynx) into the main windpipe (trachea) we find the airways that we pass through get smaller and smaller with increasing numbers of branches until the tiniest tubes open into bubbles whose walls consist of a very fine membrane. These bubbles are arranged in bunches like grapes around which is a lace work of very fine blood vessels.  In the healthy lung, when air reaches these bubbles (alveoli), oxygen passes readily through the bubble membrane into the blood stream. These fine tubes and tiny bubbles are protected from injury by minute hairs on the lining of the airways which, along with mucous, trap irritant particles moving them up to the back of the throat to be coughed or swallowed.

Lung Facts

1 There are 300 million bubbles (alveoli) in the lungs.

2 If each one could be opened up, stitched to the one next to it and laid across the floor like patchwork it would cover the size of a tennis court.

3 There is a large thick muscle across the base of your lungs which is dome-shaped and called the diaphragm. When it contracts it flattens out and as the chest muscles pull the ribs outwards the combined effect acts like a bellows sucking air into the chest (see picture above).

What is COPD?

This is a **C**hronic **P**ulmonary (lung) **D**isease. The **O**bstructive element is due to the fact that the fine branching small airways of the lungs tend to close off while breathing out making it hard to expel the air which tends to be trapped in the lungs. There are two types of disease that may be present in anyone who has COPD.

1 **Chronic bronchitis** – repeated irritation of the lining of the airways causes them to go red and raw (e.g. with smoking) and shrivels up the small hairs which normally act as a protection. The lining of the airways produce mucous which often gets infected particularly in the winter months, changing the colour from grey to yellow or green. Although smoking is far and away the most common cause, these symptoms can happen as a result of any irritation e.g. in the work environment or after severe infections.

Typically the smoker notices a cough which is often worse first thing in the morning after the first cigarette and then starts to produce phlegm on a daily basis.

2 **Emphysema** - Smoking is once again the most common cause for this component of COPD. It usually starts with more noticeable shortness of breath on exertion gradually getting worse through the years such that eventually, in more severe cases, the sufferer may not be able to walk more than a few yards without having to stop to catch their breath. Due to constant inflammation and damage to the spongy substance of the lung, the millions of tiny bubbles (alveoli) tend to dissolve, breaking down into larger bubbles with less area to pass oxygen through. This also takes away support to the tiny tubes which they surround and the tubes collapse more readily trapping air in the lungs and making breathing much harder. The damage also destroys the fine network of blood vessels further reducing the ability to pass oxygen into the blood stream. Because of the inefficiency of the damaged lungs and the obstruction to air coming back out of the lungs the patient with emphysema has to work much harder for every breath, becoming very distressed on little exertion.

Both chronic bronchitis and emphysema are quite often found in the same patient.

How does COPD damage your health?

The chronic inflammation leads to thickening of the lining of the airways with constant excess phlegm which gets repeatedly infected resulting in more damage and scarring. The associated damage to the spongy substance of the lungs (emphysema) may seriously reduce the surface area of the lung and this inefficiency results in very distressing breathlessness, cough and phlegm with subsequent chronic low oxygen levels in the blood. This causes damage to many systems in the body and eventually puts the pressure up in the arteries in the lungs which may subsequently result in the heart failing to cope. This may be apparent when the legs start to swell up with fluid.

People with COPD may have sudden worsening of their condition due to infections and need to be admitted to hospital for more intensive treatment. This may be much more common in the time around Christmas when flu is more common and this is why all patients with COPD are advised to have the flu jab in October and to contact their doctor if they have more distressing symptoms with increase in cough, yellow/green phlegm and breathlessness.

How can I tell if I am developing COPD?

If you have a smoker's cough and start to produce phlegm most mornings, particularly after your first cigarette, then you are developing chronic bronchitis. If you are starting to get easily puffed out, on exertion that you could have managed more easily the previous year, then you may be developing emphysema as well.

Whether this condition runs in your family or not it is very important to seek help from your GP if you are developing any of these symptoms.

How can we tell if you are developing COPD?

The story that you tell us is very important but we can also do some measurements and a simple blowing test called "spirometry". This involves you blowing hard into a tube joined to a measuring machine which tells us the total amount and the speed of the air that you can force out of your lungs after a deep breath in. If you are developing COPD you will not be able to force out as much air in one second as someone with healthy lungs of the same age and height. The smaller the measurement the more severe your condition is. Other tests, such as a chest X-ray and a blood test which measures the level of oxygen in your blood, will help to assess the severity.

What can you do to help yourself?

Quitting smoking is the most important thing you can do and although it will not bring your lungs back to normal it will reduce the speed with which your lungs are declining over the years and, therefore, hopefully reduce the risk of dying earlier than would be expected. Your GP or specialist would be able to give you advice about nicotine replacement therapy or special tablets to support you while trying to give up smoking.

What can we do to help you?

You may have only just started to develop symptoms of this condition and apart from advice and support in quitting smoking your GP or specialist can make sure that there are no other irritants in the atmosphere that you breathe, either at home or at work, that might be causing your problem.

Even if you have developed well established COPD there are a number of treatments that may be recommended to help you and it is important that you raise these with your doctor.

Medicines

Bronchodilators (Relievers) These are treatments which help to reduce some of the trapping of air in your lungs and make breathing feel more easy. They most often come in the form of "a puffer" (an inhaler) but may also be provided through a nebuliser, particularly in hospital, as a fine mist which you breathe through a mask for around ten minutes. These treatments are usually taken when you are struggling with your breathing and perhaps feeling more wheezy. Some bronchodilators are better taken at fixed times during the day, whereas others are best taken at the time symptoms get worse. Your doctor will advise you on this. There are also long acting bronchodilators which have some effect over 12 hours as opposed to around 4 hours for the shorter acting preparations.

Steroids Some patients who suffer with quite severe COPD and frequent attacks of distressing symptoms may benefit from inhaled steroids on a regular basis. These are, in general, safe and well tolerated unlike steroid tablets which in the long term are not preferable as they result in a number of side effects that your doctor should inform you about.

Decongestants Decongestants or mucolytics as they are sometimes called, help to thin out your phlegm reducing it's stickyness and tendency to clog up your airways. They are sometimes worth considering if you have frequent attacks of COPD with chest tightness, breathlessness and difficulty coughing up sticky phlegm.

Vaccinations Anyone who suffers with COPD should have vaccination against flu around October time each year. There is also a pneumonia jab which is available which increases immunity to a particular bug which causes pneumonia. This boosts immunity for a number of years.

Oxygen Patients with COPD may suffer with lower oxygen levels than normal and your doctor may feel it is appropriate for you to be assessed for oxygen treatment. Some patients may have such low levels of oxygen for the majority of the time that they may need to have a special oxygen machine "concentrator" supplied at home. This sucks in air and sieves out everything else except oxygen providing a pure supply all day round if required. Your doctor needs to refer you to a specialist to see whether you fulfil the criteria for having such a machine in your home and also to make sure that you tolerate the oxygen over longer periods of time. In such a treatment the oxygen needs to be breathed in for at least 15 hours a day. It has been shown that in such people this treatment can significantly prolong life. However, if you are prescribed this treatment it will be important to stop smoking as oxygen is a significant fire hazard if there are any naked flames in the vicinity.

Pulmonary rehabilitation If you become disabled because of chronic breathlessness and inability to take any form of exercise this may result in loss of muscle strength and fitness and particularly loss of confidence and independence. The process of rehabilitation may help to reduce symptoms, improve exercise ability and resultant confidence. Such programmes of rehabilitation may be found in your local hospital and your doctor may refer you to a specialist if this is felt appropriate. The programme is delivered by a specialist team who will supervise your exercise training, give you general advice with both psychological and social support. This will take the form of walking or cycling. There may also be strength building exercises for the upper limbs. Three sessions per week are usually recommended and the programme will last from 6 to 12 weeks.
Previous experience has shown that such courses of rehabilitation can improve exercise capability, general health and fitness with reduction in breathlessness on exercise.

Lung transplantation Unfortunately because of the limited number of specialist surgical centres and donors there have to be suggested age limits for consideration of lung transplantation and it is currently unlikely that anyone over the age of 65 with COPD would be considered for transplantation. However, in certain selected individuals whose pattern of emphysema includes a number of larger "bubbles" (bullae) or especially a single large bubble (bulla), there may be an option to consider surgery which bursts these bubbles and allows the remaining lung to expand and work more efficiently. This requires specialist lung function assessment and CT scanning of the chest.

General Support It is very important that you get advice from doctors and specialist nurses about maintaining an adequate diet made up of those foods that will help you most to combat infections. You may need advice about travel (particularly by air) or your entitlement to certain financial benefits. There may be times, quite naturally, that you feel down/anxious or depressed about your condition and it is important that you share this with nurses or doctors so that we can help get you through these spells.

CONCLUSION

We hope that this description of COPD and its treatment has helped you to understand your condition, the ways in which you can help yourself and the ways in which we can help you. If any of the points that have been highlighted seem to be relevant to your case then **do not hesitate to contact your doctor to get further advice and support**.

This leaflet has been produced by the Department of Respiratory Medicine, New Cross Hospital, Wolverhampton. 2003