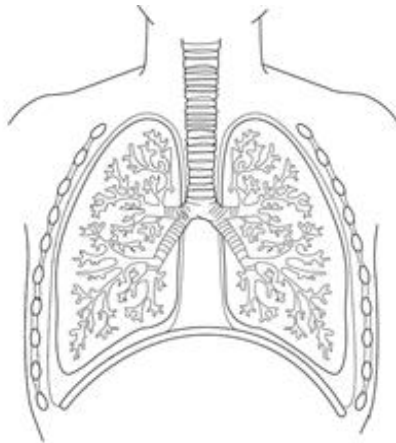


Patient information

Lung Anatomy



Breathing

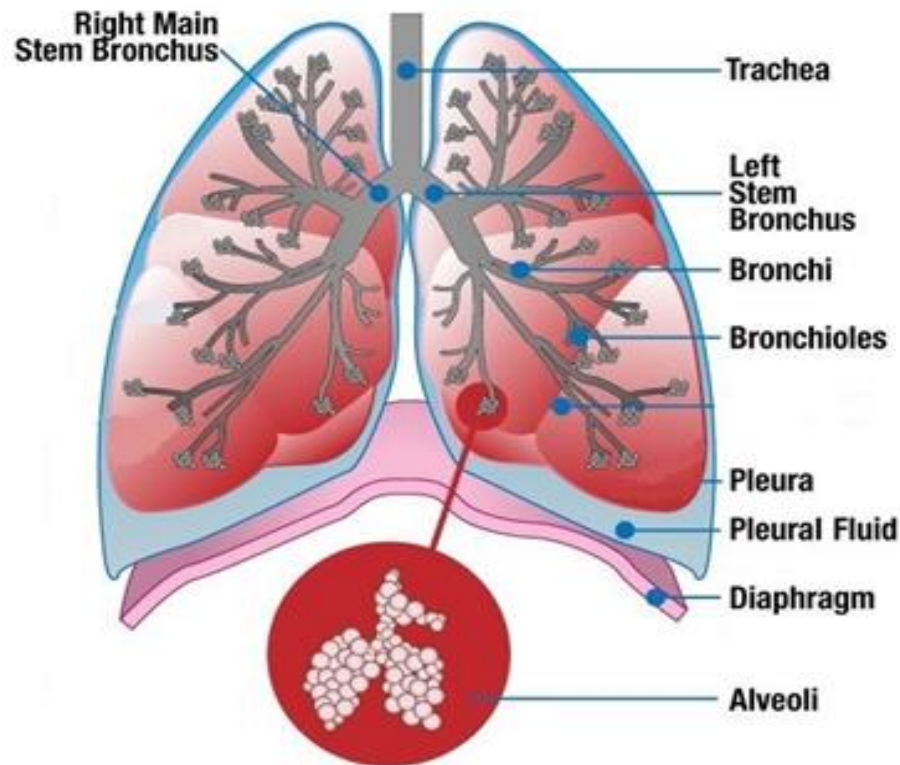
Breathing is an automatic and usually subconscious process which is controlled by the brain. The brain will determine how much oxygen we require and how fast we need to breathe in order to supply our vital organs (brain, heart, kidneys, liver, stomach and bowel), as well as our muscles and joints, with enough oxygen to carry out our normal daily activities.

In order for breathing to be effective we need to use our lungs, breathing muscles and blood system efficiently.

This leaflet should help you to better understand the process of breathing and how we get the much-needed oxygen into our bodies.

The lungs

You have two lungs, one in the right side and one in the left side of your chest. The right lung is bigger than the left due to the position of the heart (which is positioned in the left side of the chest).

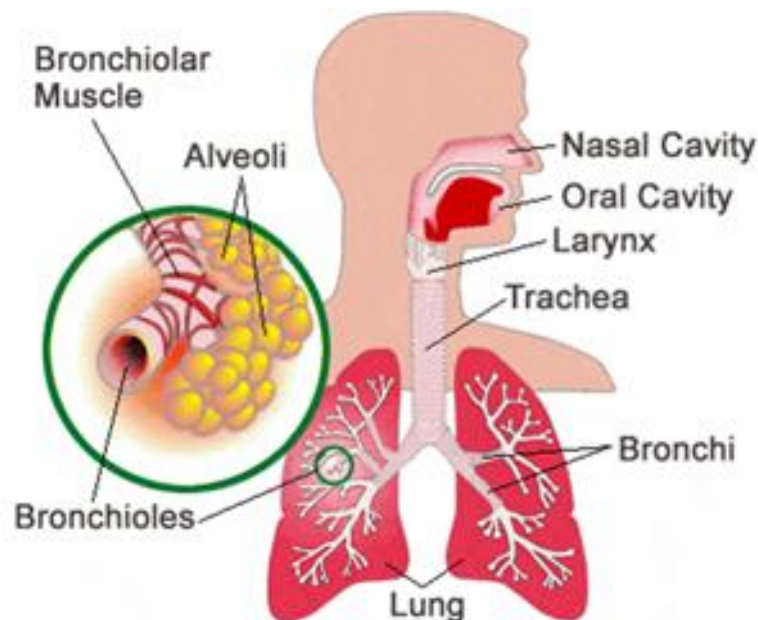


Both lungs are covered by two thin layers of tissue called the pleura. The pleura stop the surface of the lungs rubbing together as we breathe in and out. The lungs are protected by the ribcage.

The airways

Within the lungs there is a vast network of airways (tubes) which help to transport the oxygen into the lungs and the carbon dioxide out.

These tubes branch into smaller and smaller tubes the further they go into the lungs.



Trachea (windpipe): This tube connects your nose and mouth to your lungs. The trachea is supported by rings of cartilage which help to keep the airway open. At the base of the trachea the airway divides into two bronchi.

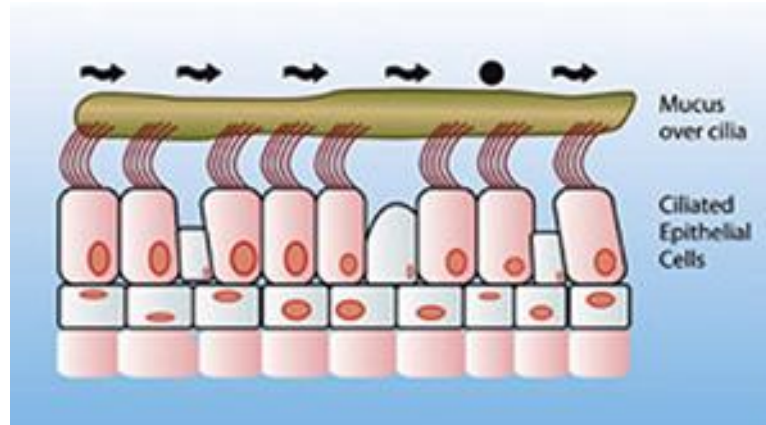
Bronchi: There are two bronchi (right and left), each one supplying its respective lung. These airways are also supported by rings of cartilage.

Bronchioles: These airways connect the bronchi to the alveoli. They are the first airways not to be supported by cartilage and this can put them at greater risk of collapse.

Alveoli: These are the tiny air sacs found at the end of the bronchioles (often described as looking like bunches of grapes!). It is here that the oxygen and carbon dioxide move between the lungs and the blood system.

The cilia

Within the larger airways are hair-like projections called cilia. These produce a sticky mucous which helps to trap dust and other particles. This mechanism helps to prevent unwanted dirt from entering the lungs and irritating them. The cilia move in a wave-like motion to help move the mucous and the dirt particles out of the lungs.



These cilia can be damaged and become ineffective in a person who smokes, or if someone is exposed to very dusty environments. This then allows the particles of smoke and dust to enter the lungs and cause permanent damage. This in turn will negatively affect the breathing process.

Muscles used for breathing

There are three main groups of muscles used to help make the process of breathing efficient and effective:

Intercostal muscles: These muscles can be found attached to, and between, the ribs. They help the ribcage to expand and shrink as we breathe so that the lungs can expand and deflate.

Accessory muscles: These muscles also help with breathing and include the muscles in the neck, back and tummy area.

The diaphragm: This is the thin, dome-shaped muscle found underneath the ribs. It separates the chest cavity from the tummy cavity. It helps with about 85% of the work of breathing and so is a very important muscle.

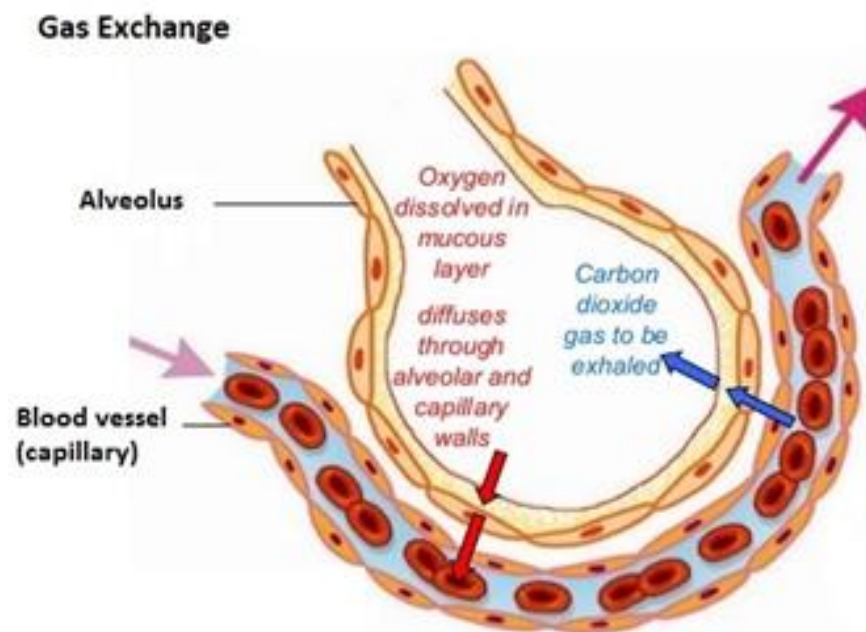
In 'normal' breathing you can see that the diaphragm is working when your tummy rises and falls with each breath.

It is important that the diaphragm is kept strong so that the breathing process can be efficient and allow the air to get down into the bottom of the lungs to keep them clear.

In people with lung conditions the diaphragm often becomes weak and ineffective. This is because short, shallow, quick breaths lead to overuse of the muscles in the upper part of the chest and so the diaphragm almost becomes redundant.

How does oxygen get into your blood?

This occurs through a process called 'gas exchange' and takes place in the alveoli.



- Air we breathe in enters the network of tubes leading from our mouth / nose.
- It travels down through these tubes to the alveoli.
- The oxygen dissolves in the mucous that lines the alveoli.
- It then passes through the very thin membrane of the alveoli and is picked up by the red blood cells (in the vast network of capillaries which surround the alveoli) and is carried to where it is needed in the body.

Damage to the alveoli which can occur in long-term lung conditions can make this process less effective and it is often more difficult for the oxygen to enter and carbon dioxide to leave the lungs.

Useful contacts

For Pulmonary Rehabilitation enquiries:

Suffolk Community Healthcare Care Co-ordination Centre (CCC)

Tel: 0300 123 2425

E-mail: pulmonaryrehabilitation@wsh.nhs.uk

Clinical research

West Suffolk NHS Foundation Trust is actively involved in clinical research. Your doctor, clinical team or the research and development department may contact you regarding specific clinical research studies that you might be interested in participating in. If you do not wish to be contacted for these purposes, please email info.gov@wsh.nsh.uk. This will in no way affect the care or treatment you receive.

Accessibility

If you require this leaflet in a different format, please contact the patient advice and liaison service on 01284 712555 or email PALS@wsh.nhs.uk

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