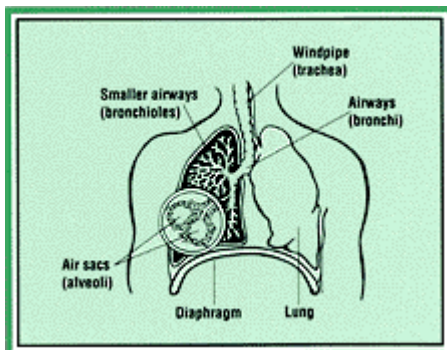


The Lungs – An overview of how they work

Every part of your body needs oxygen from the air you breathe in order to survive. The lungs are designed to absorb oxygen from the air and transfer it into the bloodstream.

The lungs are found inside the chest and are protected by the rib cage. Between the ribs are muscles that are essential for breathing. The most important muscle of breathing is called the diaphragm. It is dome shaped and lies below the lungs separating them from the abdomen. Two thin layers of tissue called the pleura cover each lung and the inside of the rib cage. These layers or membranes, slide back and forth over each other as we breathe.

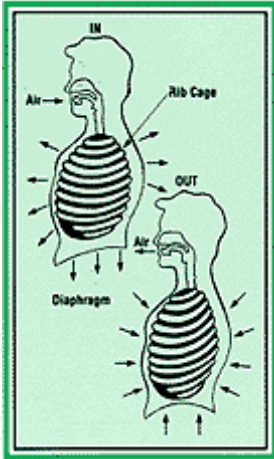
The lungs are made up of several sections called lobes - three on the right and two on the left. The inside of your lungs looks like a giant sponge. It is a mass of fine tubes, the smallest of which end in tiny air sacs called alveoli. These air sacs have very thin walls which are criss-crossed with hundreds of tiny blood vessels called capillaries. There are 200 million or so of these air sacs, and if they were to spread out they would cover a piece of ground roughly the size of a tennis court.



What makes you breathe?

The breathing centre in the brain is constantly receiving signals from the body about the amount of oxygen which is needed. This will depend on how active you are. When you are asleep you will need far less oxygen than when you are running to catch a bus. When you are asleep you will breathe more slowly and when you are running you will breathe more quickly.

Once the brain knows how much oxygen is needed it sends messages along nerves to the breathing muscles so that the right amount of air is breathed into the lungs.



How do you breathe?

Your lungs have no muscles themselves. Breathing occurs when the breathing centre in the brain sends a message along the nerves to your breathing muscles. The muscles contract and you breathe in. Your diaphragm is pulled flat and, at the same time, the muscles between your ribs shorten and pull your ribcage upwards and outwards. This ensures that the lungs have the largest possible amount of space to expand into.

Each time you breathe, air is drawn into your nose or mouth down through your throat and into your windpipe, or trachea.

The windpipe is a tube about 10-12cm long in adults, and splits into two smaller air tubes called the bronchi, one of which goes to the left lung and the other to the right lung.

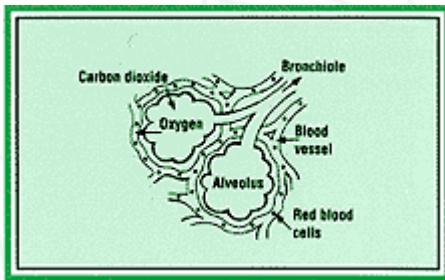
The air passes down the bronchi which divide another 15 to 25 times into thousands of smaller and smaller airways, called bronchioles, until the air reaches the alveoli.

Breathing out is usually just a matter of relaxing the diaphragm and the muscles between the ribs so that the air is pushed out and the lungs return to their resting size.

How does oxygen get into the bloodstream?

Inside the alveoli, oxygen moves across the paper thin walls of tiny blood vessels, called capillaries, and into the blood, where it is picked up by chemicals in the red blood cells ready to be carried around the body. At the same time, a waste product from the body called carbon dioxide, comes out of the capillaries back into the alveoli, ready to be breathed out.

Freshly oxygenated blood is carried from the lungs to the heart which pumps blood around the body through the arteries. Once the oxygen has been used up in the tissues of the body, the blood returns, through the veins, to the heart. It is then pumped to the lungs so that the carbon dioxide can be removed and more oxygen taken up.



What else do lungs do?

With about 10,000 litres of air moving in and out of the lungs every day, germs and other foreign bodies can also find their way into the airways. The lungs are provided with a number of complex defence systems to prevent unwanted material from getting into the body.

Mucus produced in the walls of the airways helps to trap any particles. Proteins called antibodies are produced which protect against foreign and unwanted inhaled material and germs. Tiny hairs line the bronchi and help move unwanted materials up to the mouth where they can be coughed out or blown into a handkerchief or tissue.

The delicate structure of the lungs is beautifully adapted to carry out the complex business of breathing and, at the same time, helps protect the body from outside attack. Most of the time we are not even aware that our lungs are working, but they can be damaged in many ways and become less efficient at taking oxygen from the air and getting rid of waste carbon dioxide.

TD0811V2Lungs

Last Updated (23 July 2013)

This brochure is one in a series produced by Lung Foundation Australia to provide information on lung disease, its treatment and related issues. The information published by Lung Foundation Australia is designed to be used as a guide only, is not intended or implied to be a substitute for professional medical treatment and is presented for the sole purpose of disseminating information to reduce lung disease.

Any information relating to medication brand names is correct at the time of printing. Lung Foundation Australia has no control or responsibility for the availability of medications, which may occasionally be discontinued or withdrawn.

Please consult your family doctor or specialist respiratory physician if you have further questions relating to the information contained in this leaflet. For details of patient support groups in Australia please call 1800 654 301.