



HOW THE LUNGS WORK

Unusual facts about the Lungs

- Our lungs are about the size of a pair of footballs¹
- The surface area of the lungs is roughly the same size as a tennis court²
- Male lungs weigh on average 1060 grams, while female lungs average 930 grams³
- Each day an average person breathes about 25,000 times, and by the time a person reaches 70 years old, they will have taken at least 600 million breaths⁴
- The lungs are the only organ in the body that can float on water⁵
- In the course of a single day, 8,000 to 9,000 litres of breathed-in air meets 8,000 to 10,000 litres of blood pumped in by the heart through the pulmonary artery⁶
- The lungs are the largest organ in the body and the only internal organ exposed to the external environment^{7,8}
- With each breath, a host of alien substances enter our bodies - including pollens, dust, viruses, bacteria and the constituents of the air in our homes and offices and factories, ranging from animal dander and tobacco smoke to radon and airborne lead⁹
- New babies at rest breathe between 40 and 50 times per minute. By age five it decreases to around 25 times per minute¹⁰
- At rest, an adult breathes about 14 to 16 times per minute. After exercise this can increase to over 60 times per minute¹¹

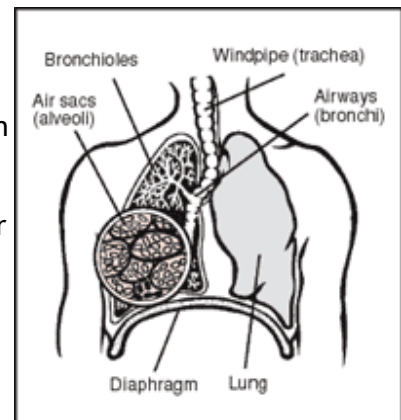
What do our lungs look like?

- The lungs lie on either side of the heart and fill the inside of the chest. In an adult, each lung weighs about a 1lb. However, the right lung is a little larger than the left because there is more room for it. The left lung has to share its space with the heart
- Two thin layers of tissue, called the pleura, cover each lung. These layers - or membranes - slide back and forth over each other as a person breathes so that the lungs can expand and contract
- Both lungs are made up of lobes - three on the right and two on the left. The inside of the lungs looks like a giant sponge. It is a mass of fine tubes, the smallest of which end in tiny air sacs called alveoli

- The alveoli have very thin walls. They are criss-crossed with the finest of blood vessels called capillaries
- The lungs are protected by the rib cage. Between the ribs are muscles that are essential for breathing. Below the lungs is a dome-shaped muscle called the diaphragm. The diaphragm separates the chest from the abdomen and is also involved in breathing

Why do we breathe?

- Every part of the body needs oxygen from the air to survive. It is carried around the body by red blood cells in the bloodstream. Since oxygen cannot get into the blood directly, through the skin, a complicated system is present in the lungs to absorb it from the air and transfer it to the bloodstream



What makes us breathe?

- Before birth a baby relies on its mother's blood for oxygen and its lungs are filled with liquid. But from the moment of birth it must draw air into its lungs and breathe in its own oxygen
- The breathing centre in the brain is constantly receiving signals from the body about the amount of oxygen that is needed. This depends on how active a person is. For example while a person is asleep less oxygen is needed so they breathe more slowly, when they are active, more oxygen is needed and they breathe more quickly
- Once it knows how much oxygen is needed, the brain sends messages along nerves to the breathing muscles, so that the right amount of air is breathed into the lungs
- When the nerves to the breathing muscles tell the lungs to breathe in, the diaphragm is pulled flat
- At the same time, the muscles between the ribs shorten and pull in the rib cage upwards and outwards which ensures that the lungs have the largest possible amount of space to expand into. This process means that the optimum amount of oxygen can be breathed in to the lungs

How do we breathe?

- Each time someone takes a breath, air is drawn into the nose or mouth, down through the throat and into the windpipe (trachea). This windpipe is a tube about four or five inches 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 12 to 25 times into thousands of 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. This pushes the air out and the lungs return to their resting size

How does oxygen get into the bloodstream?

- Inside the alveoli, oxygen moves across paper thin walls to the capillaries (tiny blood vessels) and into the blood. It is then picked up by chemicals (haemoglobin) in the red blood cells that carry it around the body. At the same time waste products from the body, in the form of carbon dioxide, come out of the capillaries back into the alveoli, ready to be breathed out
- Freshly oxygenated blood is carried from the lungs to the left side of the heart which pumps the blood around the body through the arteries. Once the oxygen has been used up, the blood returns, through the veins, to the right side of the heart. From there it is pumped to the lungs so that the carbon dioxide can be removed and more oxygen taken on board

For further information, please contact:
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References:

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