

What Are the Lungs?

Your lungs are organs in your chest that allow your body to take in oxygen from the air. They also help remove carbon dioxide (a waste gas that can be toxic) from your body.

The lungs' intake of oxygen and removal of carbon dioxide is called gas exchange. Gas exchange is part of breathing. Breathing is a vital function of life; it helps your body work properly.

Other organs and tissues also help make breathing possible. (For more information, go to ["The Respiratory System"](#) section of this article.)

The Respiratory System

The respiratory system is made up of organs and tissues that help you breathe. The main parts of this system are the airways, the lungs and linked blood vessels, and the muscles that enable breathing.

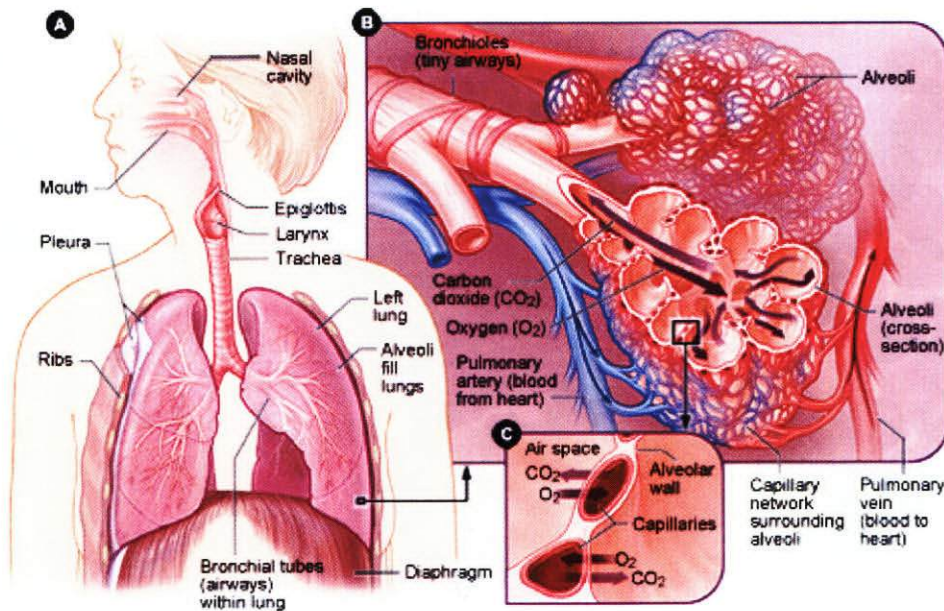


Figure A shows the location of the respiratory structures in the body. Figure B is an enlarged view of the airways, alveoli (air sacs), and capillaries (tiny blood vessels). Figure C is a closeup view of gas exchange between the capillaries and alveoli. CO₂ is carbon dioxide, and O₂ is oxygen.

Airways

The airways are pipes that carry oxygen-rich air to your lungs. They also carry carbon dioxide, a waste gas, out of your lungs. The airways include your:

- Nose and linked air passages (called nasal cavities)
- Mouth
- Larynx (LAR-ingks), or voice box
- Trachea (TRA-ke-ah), or windpipe
- Tubes called bronchial tubes or bronchi, and their branches

Air first enters your body through your nose or mouth, which wets and warms the air. (Cold, dry air can irritate your lungs.) The air then travels through your voice box and down your windpipe. The windpipe splits into two bronchial tubes that enter your lungs.

A thin flap of tissue called the epiglottis (ep-ih-GLOT-is) covers your windpipe when you swallow. This prevents food and drink from entering the air passages that lead to your lungs.

Except for the mouth and some parts of the nose, all of the airways have special hairs called cilia (SIL-e-ah) that are coated with sticky mucus. The cilia trap germs and other foreign particles that enter your airways when you breathe in air.

These fine hairs then sweep the particles up to the nose or mouth. From there, they're swallowed, coughed, or sneezed out of the body. Nose hairs and mouth saliva also trap particles and germs.

Lungs and Blood Vessels

Your lungs and linked blood vessels deliver oxygen to your body and remove carbon dioxide from your body. Your lungs lie on either side of your breastbone and fill the inside of your chest cavity. Your left lung is slightly smaller than your right lung to allow room for your heart.

Within the lungs, your bronchi branch into thousands of smaller, thinner tubes called bronchioles. These tubes end in bunches of tiny round air sacs called alveoli (al-VEE-uhl-eye).

Each of these air sacs is covered in a mesh of tiny blood vessels called capillaries. The capillaries connect to a network of arteries and veins that move blood through your body.

The pulmonary (PULL-mun-ary) artery and its branches deliver blood rich in carbon dioxide (and lacking in oxygen) to the capillaries that surround the air sacs. Inside the air sacs, carbon dioxide moves from the blood into the air. At the same time, oxygen moves from the air into the blood in the capillaries.

The oxygen-rich blood then travels to the heart through the pulmonary vein and its branches. The heart pumps the oxygen-rich blood out to the body. (For more information about blood flow, go to the Health Topics [How the Heart Works](#) article.)

The lungs are divided into five main sections called lobes. Some people need to have a diseased lung lobe removed. However, they can still breathe well using the rest of their lung lobes.

Muscles Used for Breathing

Muscles near the lungs help expand and contract (tighten) the lungs to allow breathing. These muscles include the:

- Diaphragm (DI-ah-fram)
- Intercostal muscles
- Abdominal muscles
- Muscles in the neck and collarbone area

The diaphragm is a dome-shaped muscle located below your lungs. It separates the chest cavity from the abdominal cavity. The diaphragm is the main muscle used for breathing.

The intercostal muscles are located between your ribs. They also play a major role in helping you breathe.

Beneath your diaphragm are abdominal muscles. They help you breathe out when you're breathing fast (for example, during physical activity).

Muscles in your neck and collarbone area help you breathe in when other muscles involved in breathing don't work well, or when lung disease impairs your breathing.