

Respiratory system

Our cells need oxygen to survive. One of the waste products produced by cells is another gas called carbon dioxide. The respiratory system takes up oxygen from the air we breathe and expels the unwanted carbon dioxide. The main organ of the respiratory system is the lungs.

The nose and trachea

Breathing in through the nose humidifies the air. Nose hairs help to trap any particles of dust. The warmed air enters the lungs through the windpipe, or trachea. The trachea is a hollow tube bolstered by rings of cartilage to prevent it from collapsing.

The lungs

The lungs are inside the chest, protected by the ribcage and wrapped in a membrane called the pleura. The lungs look like giant sponges, since they are filled with thousands of tubes, branching smaller and smaller. The smallest components of all are the air sacs, called 'alveoli'. Each one has a fine mesh of capillaries. This is where the exchange of oxygen and carbon dioxide takes place.

The breathing muscles

To stay inflated, the lungs rely on a vacuum inside the chest. The diaphragm is a sheet of muscle slung underneath the lungs. When we breathe, the diaphragm contracts and relaxes. This change in air pressure means that air is 'sucked' into the lungs on inhalation and 'pushed' out of the lungs on exhalation. The intercostal muscles between the ribs help to change the internal pressure by lifting and relaxing the ribcage in rhythm with the diaphragm.

The exchange of gas

The blood containing carbon dioxide enters the capillaries lining the alveoli. The gas moves from the blood across a thin film of moisture and into the air sac. The carbon dioxide is then breathed out. On inhalation, oxygen is drawn down into the alveoli where it passes into the blood using the same film of moisture.

Speech

The respiratory system also allows us to talk. Exhaled air runs over the vocal cords inside the throat. The sound of the voice depends on:

- The tension and length of the vocal cords
- The shape of the chest
- How much air is being exhaled.

Common problems

Some common problems of the respiratory system include:

- **Asthma** - wheezing and breathlessness caused by a narrowing of the airways.
- **Bronchitis** - inflammation of the lung's mucous lining.
- **Emphysema** - disease of the alveoli.
- **Hayfever** - an allergic reaction to pollen, dust or other irritants.
- **Influenza** - caused by viruses.
- **Laryngitis** - inflammation of the vocal cords (larynx).

- **Pneumonia** - inflammation of the lung.

Where to get help

- The Australian Lung Foundation toll free on 1800 654 301
- Your doctor

Things to remember

- Respiration is the uptake of oxygen and the removal of carbon dioxide.
- This job is performed by the lungs.
- Breathing is achieved by contraction and relaxation of the diaphragm and rib muscles.

This page has been produced in consultation with, and approved by:

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