

**Tikrit University**

**College of Nursing**

**Basic Nursing Sciences**



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**Physiology**

**Respiratory system**

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# Respiratory System

What is the respiratory system?

Your respiratory system is the organs and structures in your body that allow you to breathe. It includes your lungs, nose, mouth and the tubelike structures (airways) that connect them. You also have muscles and blood vessels that support your respiratory system, and ribs to protect it. These parts work together to bring oxygen into your body when you inhale and get rid of carbon dioxide when you exhale.

## Function

What is the main function of your respiratory system?

The main function of your respiratory system is to pull in oxygen for your body's cells and get rid of carbon dioxide, a waste product. You do this by breathing in and out and through gas exchange between the small air sacs of your lungs (alveoli) and the blood vessels running nearby. Your respiratory system also:

- **Warms and adds moisture to the air you breathe in.** Your respiratory system warms the air to match your body temperature. It moisturizes the air to bring it to the humidity level your body needs.
- **Protects your body from particles you breathe in.** Parts of your respiratory system can block harmful germs and irritants from getting in — or push them out if they do get in.
- **Allows you to talk.** Air vibrates your vocal cords, which makes sounds.

- **Helps you smell.** Breathing in air moves its molecules past your olfactory nerve, which sends messages to your brain about the way something smells.
- **Balances level of acidity in your body.** Too much carbon dioxide lowers your blood's pH, making it acidic. By removing carbon dioxide, your respiratory system helps maintain the acid-base balance in your body.

## **What are the parts of the respiratory system?**

The main organs of your respiratory system are your lungs. But your respiratory system has many different parts that work together to help you breathe. Parts of your respiratory system include your:

- Nose and nasal cavity.
- Mouth and oral cavity.
- Sinuses.
- Pharynx (throat).
- Larynx (voice box).
- Trachea (windpipe).
- Bronchi (large airways).
- Lungs.
- Diaphragm.

## **What's your upper respiratory tract?**

Your upper respiratory tract brings air into your body and helps move it toward your lungs. It adds moisture to the air you breathe in. Your respiratory tract starts with your nose and mouth, where you pull air into your body. Other parts of your upper respiratory tract include your nasal cavity, sinuses (hollow areas in your cheeks and forehead) and larynx.

## **What's your lower respiratory tract?**

Your lower respiratory tract consists of your trachea, bronchi and lungs. Your trachea, bronchi and bronchioles (small airways) make up your tracheobronchial (pronounced “tray-key-oh-BRON-key-uhl”) tree, a series of increasingly smaller tubes that transport air from your upper respiratory tract to small air sacs in your lungs (alveoli). (It looks a bit like an upside-down tree.)

## **How does your respiratory system work?**

Your cells need oxygen to create energy. Creating energy releases carbon dioxide as a waste product, which can harm your body if too much builds up. The main job of your respiratory system is to bring oxygen into your lungs and move carbon dioxide out of them (gas exchange). It works closely with your circulatory system — your heart, blood and blood vessels — to do this.

Think of the oxygen in the air as passengers on millions of planes flying into your lungs every time you breathe in. Your diaphragm pulls down, creating more space in your chest, which pulls air (and its tiny oxygen cargo) into your lungs. The air travels through your mouth or nose and down your trachea, bronchi and bronchioles, like airport runways. Then the passengers arrive at the airport gates, your alveoli.

There, the oxygen moves through the membranes surrounding your lungs into small blood vessels (capillaries). You can imagine it like the oxygen passengers getting picked up by a taxi at the airport. Finally, the taxi travels out to your tissues, dropping off oxygen to give your cells energy.

## **How your respiratory system gets rid of carbon dioxide**

When cells use energy, they produce carbon dioxide. When the oxygen gets out of the taxi in your tissues, carbon dioxide molecules hop in. From there, they travel through your bloodstream and to the airport gates in your lungs. They fly out of your lungs when your diaphragm moves back upwards, making your chest cavity smaller and causing you to push the air out the way it came.

### **Other functions**

While you're breathing in and out, your respiratory system also protects your body from dry air and potentially harmful particles. When you inhale, your sinuses help regulate the temperature and humidity of the air.

As air moves through your nostrils and down your airways, tiny hairs (cilia) filter out dust, germs and other irritants to keep them from getting into your airways and lungs. When irritants or germs do find their way in, your respiratory system traps them in mucus. Then cilia in your airways move in a wavelike motion to push the mucus out of your body when you cough or sneeze.