

# The Respiratory system

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# THE RESPIRATORY SYSTEM

### Paranasal Sinuses

**Anterior View**

- Frontal sinus
- Ethmoid cells
- Sphenoid sinus
- Middle nasal concha
- Maxillary sinus
- Inferior nasal concha
- Superior nasal concha
- Sphenoidal sinus

**Lateral View**

- Frontal sinus
- Ethmoid cells
- Sphenoid sinus
- Middle nasal concha
- Maxillary sinus
- Inferior nasal concha
- Superior nasal concha
- Sphenoidal sinus

### Conducting System

The conducting system comprises all of the passages through which air travels to and from the lungs. These passages include the nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, and terminal bronchioles. The conducting system acts to warm, humidify, and filter the air before it reaches the gas exchange area of the lungs.

### Lungs and Pleurae

The general term for the membranes that cover the lungs and line the thoracic cavity is the pleura. The space between the two layers of the pleura is the pleural cavity, which contains a small amount of pleural fluid to reduce friction during the movement of the lungs in the chest.

### Larynx

**Anterior View**

- Epiglottis
- Hyoid bone
- Thyroid cartilage
- Cricoid cartilage
- Tracheal cartilage
- Trachea

**Cartilages**

- Thyroid cartilage
- Cricoid cartilage
- Tracheal cartilage
- Epiglottis

### Respiratory Mucosa

The respiratory mucosa is the lining of the respiratory tract. It consists of a layer of columnar epithelium, a layer of connective tissue, and a layer of mucus. The mucus is secreted by goblet cells and traps dust and bacteria. The mucosa is also responsible for the production of surfactant, which reduces surface tension in the alveoli.

### Bronchopulmonary Segments

**Anterior View**

- Right: Superior, Middle, Inferior
- Left: Superior, Middle, Inferior

**Posterior View**

- Right: Superior, Middle, Inferior
- Left: Superior, Middle, Inferior

### Structure of Intrapulmonary Airways

The intrapulmonary airways consist of the bronchi, bronchioles, and terminal bronchioles. The bronchi are the largest airways and are lined with cartilage. The bronchioles are smaller and lack cartilage. The terminal bronchioles are the smallest airways and lead to the alveoli.

### Cross Section of Alveolus

The alveolus is the site of gas exchange. It is a small, sac-like structure with a thin wall. The wall is composed of a single layer of cuboidal epithelial cells. The alveolus is surrounded by a network of capillaries. The capillaries are lined with a single layer of endothelial cells. The space between the alveolus and the capillaries is the blood-air barrier.

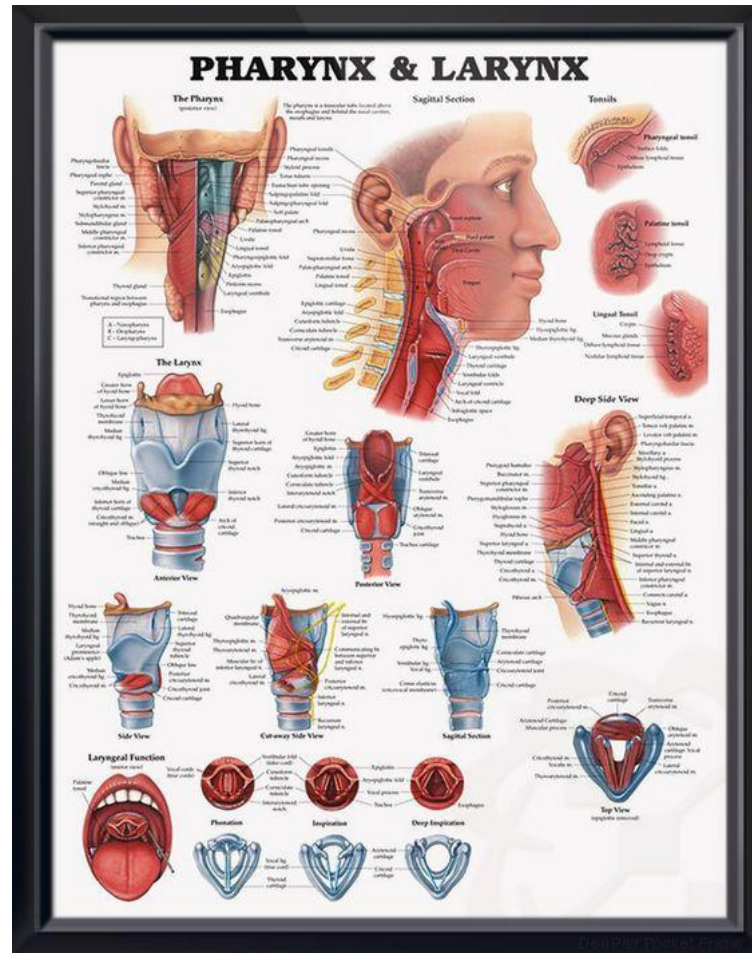
### Ventilation

Breathing, or ventilation, is the movement of air into and out of the respiratory system. During inspiration, the diaphragm contracts and moves down, increasing the volume of the thoracic cavity. This causes the air pressure to decrease, and air flows into the lungs. During expiration, the diaphragm relaxes and moves up, decreasing the volume of the thoracic cavity. This causes the air pressure to increase, and air flows out of the lungs.

### Gas Exchange

The respiratory system consists of the respiratory tract, which carries air to and from the lungs. The respiratory tract is divided into the upper respiratory tract (nose, mouth, and pharynx) and the lower respiratory tract (larynx, trachea, bronchi, and bronchioles). The alveoli are the site of gas exchange. The alveoli are surrounded by a network of capillaries. The capillaries are lined with a single layer of endothelial cells. The space between the alveolus and the capillaries is the blood-air barrier.

# PHARYNX, LARYNX



# ASTHMA

## UNDERSTANDING ASTHMA

### How Do the Lungs Work?

The lungs are made of two lobes. Each lobe is divided into smaller sections called lobules. The lobules are made of many small sacs called alveoli. The alveoli are where oxygen and carbon dioxide are exchanged. The air enters the lungs through the trachea, the bronchi, and the bronchioles. The air then goes to the alveoli. The blood in the alveoli picks up the oxygen and gives it to the rest of the body. The blood also picks up carbon dioxide from the rest of the body and gives it to the lungs. The air then leaves the lungs through the trachea.

1. Air enters the lungs through the trachea.
2. The air goes to the bronchi.
3. The air goes to the bronchioles.
4. The air goes to the alveoli.
5. The blood in the alveoli picks up the oxygen and gives it to the rest of the body.
6. The blood also picks up carbon dioxide from the rest of the body and gives it to the lungs.

### What Happens in an Asthma Attack?

During an asthma attack, the airways become inflamed and narrow. This makes it difficult to breathe. The airways also produce more mucus, which can block the airways. The inflammation and mucus production are caused by an allergic reaction to an allergen. The allergen triggers the immune system to release chemicals that cause the airways to react. The reaction causes the airways to become inflamed and narrow. This makes it difficult to breathe. The airways also produce more mucus, which can block the airways.

### What is Asthma?

Asthma is a chronic condition that affects the airways. It causes the airways to become inflamed and narrow. This makes it difficult to breathe. The airways also produce more mucus, which can block the airways. The inflammation and mucus production are caused by an allergic reaction to an allergen. The allergen triggers the immune system to release chemicals that cause the airways to react. The reaction causes the airways to become inflamed and narrow. This makes it difficult to breathe. The airways also produce more mucus, which can block the airways.

### What Causes Asthma?

Asthma is caused by a combination of genetic and environmental factors. Genetic factors include a family history of asthma and certain genes. Environmental factors include exposure to allergens, air pollution, and tobacco smoke. Asthma is also more common in people who are allergic to certain things.

### How is Asthma Diagnosed?

Asthma is diagnosed based on a person's symptoms and a physical exam. A doctor may also use a spirometry test to measure how much air a person can breathe out. A spirometry test involves blowing into a device that measures the amount of air that is exhaled. The test is done twice, once before and once after using an inhaler. If the amount of air that is exhaled is significantly higher after using the inhaler, it may be a sign of asthma.

### Monitoring Your Asthma by Zone

Green Zone	Yellow Zone	Red Zone
<p>The asthma symptoms are mild and do not affect daily activities. You are breathing easily and your peak flow is in the green zone.</p> <p><b>Asthma:</b> Keep everything the same. Continue to take your asthma medicine as prescribed by your healthcare provider. Check your peak flow at the beginning and end of each day.</p>	<p>There may be coughing, wheezing, and mild shortness of breath. Sleep and school activities may be affected. Your peak flow is in the yellow zone.</p> <p><b>Asthma:</b> Keep everything the same. Continue to take your asthma medicine as prescribed by your healthcare provider. Check your peak flow at the beginning and end of each day.</p>	<p>Symptoms may be both frequent and severe. Sleep and school activities may be affected. Your peak flow is in the red zone.</p> <p><b>Asthma:</b> Call your healthcare provider.</p>

### Symptoms of Asthma

The symptoms of asthma are coughing, wheezing, and shortness of breath. The symptoms may be mild or severe. The symptoms may be constant or they may come and go. The symptoms may be triggered by an allergen or they may be triggered by something else. The symptoms may be triggered by an allergen or they may be triggered by something else.

### Common Asthma Triggers

The most common asthma triggers are allergens. Allergens are substances that cause an allergic reaction. Allergens can be found in the air, on surfaces, and in food. Allergens can also be found in animals and plants. Allergens can also be found in pollen and mold. Allergens can also be found in dust and pet dander. Allergens can also be found in food and medicine. Allergens can also be found in smoke and perfume. Allergens can also be found in latex and certain metals.

### Management of Asthma

Asthma is a chronic condition that requires ongoing management. The goal of asthma management is to prevent asthma symptoms and to keep asthma under control. Asthma management involves taking asthma medicine as prescribed by your healthcare provider. Asthma management also involves avoiding asthma triggers. Asthma management also involves monitoring your asthma symptoms and your peak flow. Asthma management also involves using a peak flow meter to monitor your peak flow. Asthma management also involves using a spacer device to help you breathe in your asthma medicine. Asthma management also involves using a nebulizer to deliver your asthma medicine to your lungs. Asthma management also involves using an inhaler to deliver your asthma medicine to your lungs. Asthma management also involves using a dry powder inhaler to deliver your asthma medicine to your lungs. Asthma management also involves using a soft-mist inhaler to deliver your asthma medicine to your lungs. Asthma management also involves using a combination inhaler to deliver your asthma medicine to your lungs. Asthma management also involves using a long-acting beta-agonist (LABA) to help you breathe. Asthma management also involves using a corticosteroid to help you breathe. Asthma management also involves using a combination of a LABA and a corticosteroid to help you breathe. Asthma management also involves using a combination of a LABA, a corticosteroid, and a long-acting muscarinic antagonist (LAMA) to help you breathe. Asthma management also involves using a combination of a LABA, a corticosteroid, and a LAMA to help you breathe. Asthma management also involves using a combination of a LABA, a corticosteroid, and a LAMA to help you breathe.

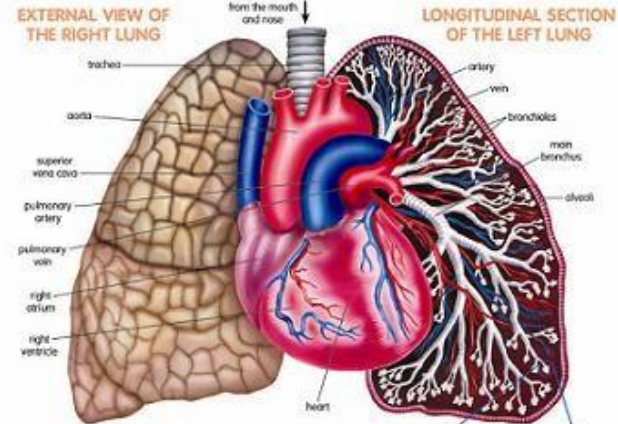
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# Respiration



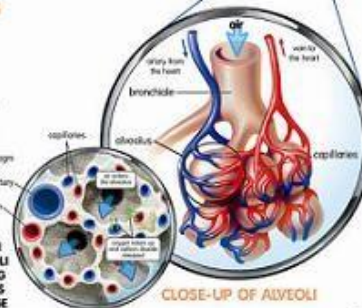
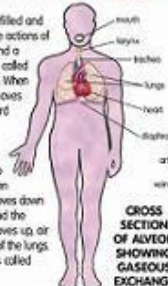
## Respiration

Respiration is the intake of oxygen from the air into the body through specialised organs called the lungs. The air is taken in through the mouth and nose into both lungs via the trachea and bronchi into small sacs called alveoli. From the alveoli oxygen diffuses into the bloodstream. Carbon dioxide passes from the blood into the alveoli and is exhaled out of the body.

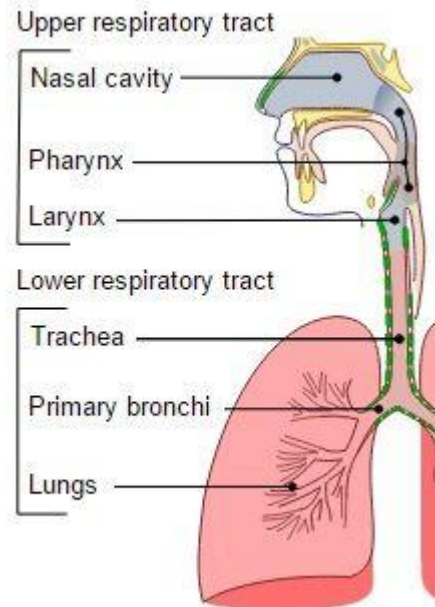


### THE POSITION OF THE LUNGS

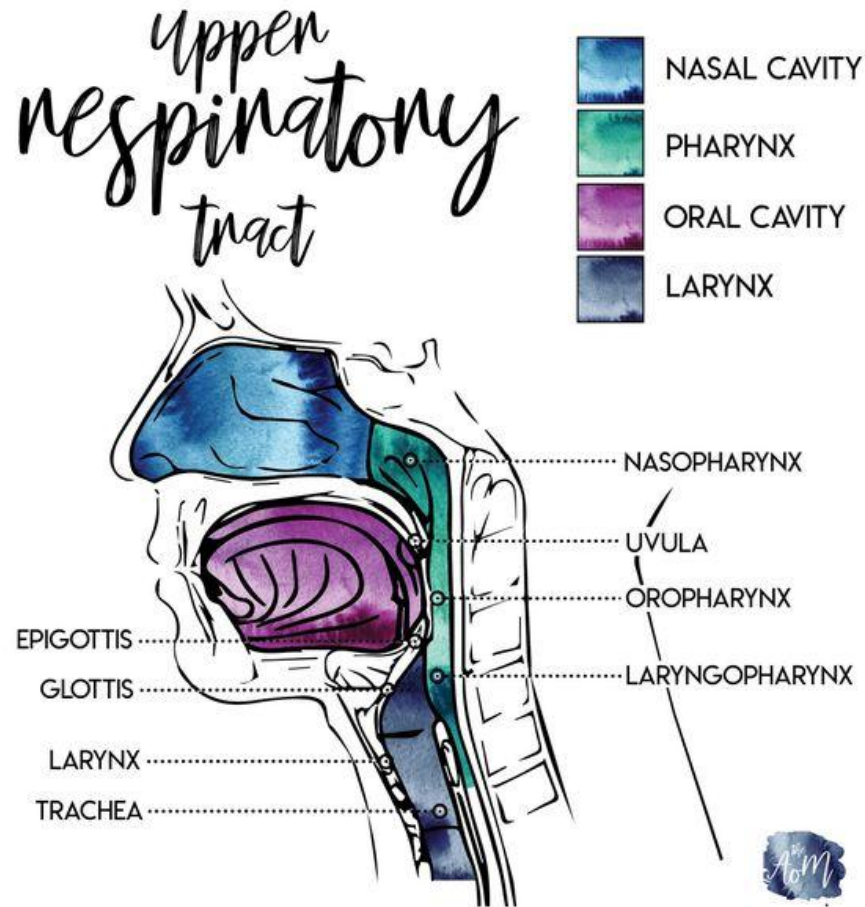
The lungs are filled and emptied by the actions of the rib cage and a special muscle called the diaphragm. When the rib cage moves up and outward and the diaphragm moves down, air is pulled into the lungs. When the rib cage moves down and inward and the diaphragm moves up, air is pushed out of the lungs. This process is called breathing.



# Histology of the Airways



# Upper respiratory system



# First Aid





# Problems of the Respiratory System

Lesson

**2**

## *Problems of the Respiratory System (cont'd.)*

<b>Disease or Disorder</b>	<b>Description</b>	<b>Treatment</b>
<b>Cold/Flu</b>	<b>Diseases caused by viruses; symptoms include runny nose, cough, fever, aches</b>	<b>Bed rest and fluids; vaccines can prevent some types of flu</b>
<b>Pneumonia</b>	<b>Bacterial or viral disease that affects the lungs; symptoms include fever, chest pain, breathing difficulty</b>	<b>Antibiotics for bacterial type; bed rest for viral type</b>
<b>Asthma</b>	<b>Disease in which airways narrow; symptoms include wheezing, shortness of breath, coughing</b>	<b>Medication to relieve symptoms; avoiding activities or substances that trigger attacks</b>

