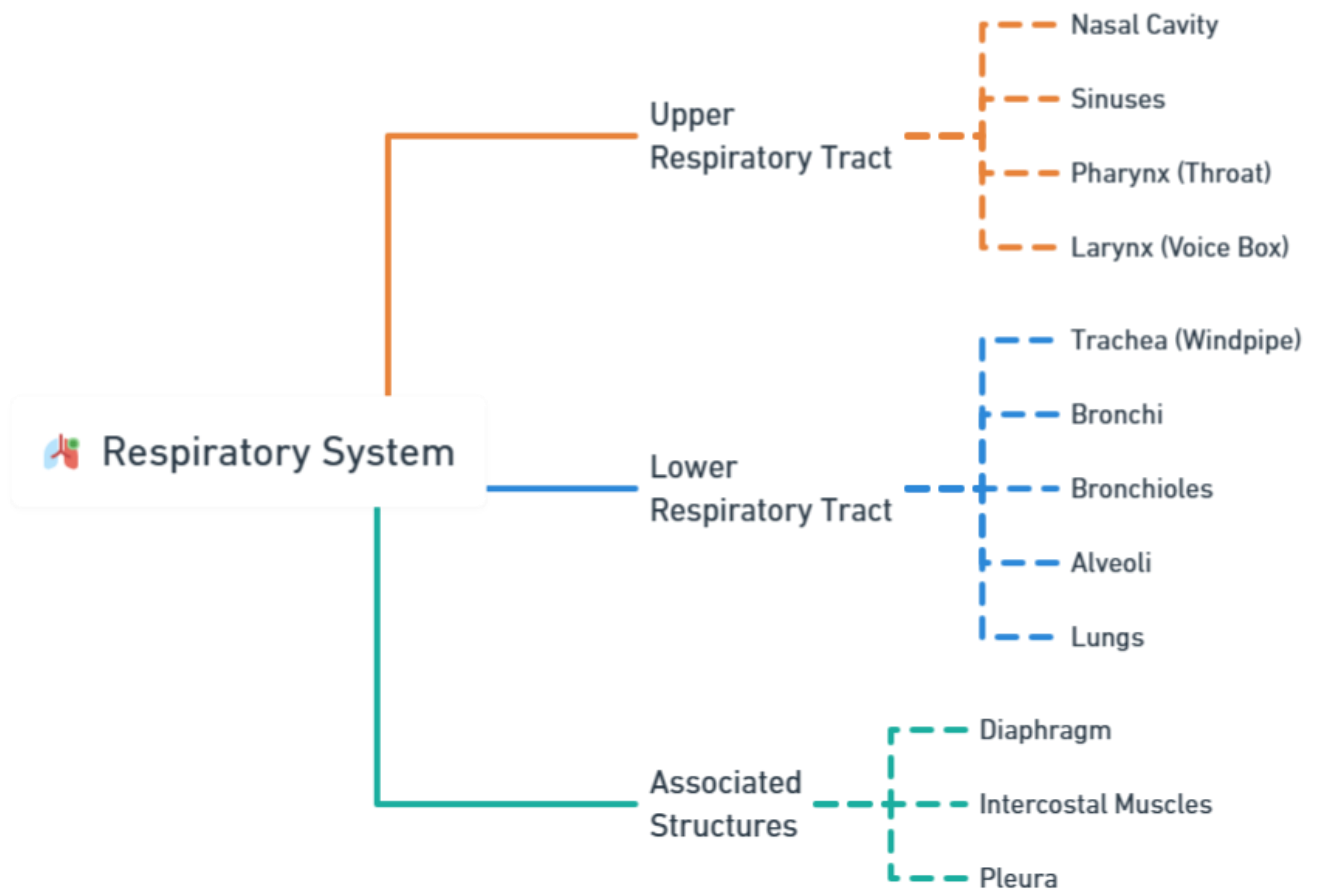


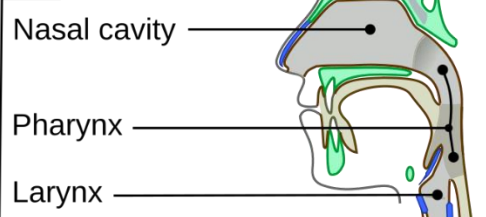
Respiratory System

Anatomy of respiratory organs and functions

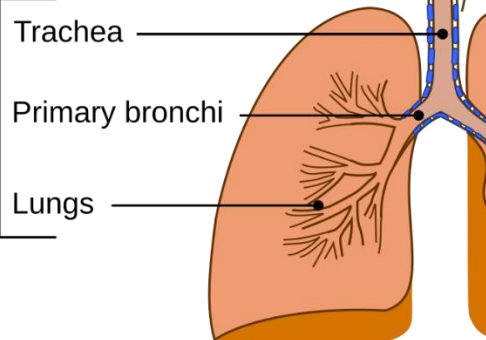
- The respiratory system is a vital organ system responsible for gas exchange, supplying oxygen to the body and removing carbon dioxide.
- Here's an overview of its anatomy, divided into the upper respiratory tract and the lower respiratory tract:



Upper respiratory tract



Lower respiratory tract



Upper Respiratory Tract

1. Nasal Cavity:

- **Structure:** Divided by the nasal septum; contains turbinates (conchae) to increase surface area.
- **Function:** Filters, warms, and moistens incoming air; houses olfactory receptors for smell.

2. Sinuses:

- **Structure:** Air-filled cavities in the skull (e.g., frontal, maxillary, sphenoid, and ethmoid sinuses).
- **Function:** Lighten the skull, enhance voice resonance, and aid in warming/moistening air.

3. Pharynx (Throat):

- **Sections:**
 - **Nasopharynx:** Connects to the nasal cavity; contains the adenoids and openings of the Eustachian tubes.
 - **Oropharynx:** Shared passageway for air and food.
 - **Laryngopharynx:** Leads to the larynx and esophagus.
- **Function:** Directs air to the larynx.

4. Larynx (Voice Box):

- **Structure:** Composed of cartilage (e.g., thyroid cartilage, cricoid cartilage, and epiglottis).
- **Function:** Protects the airway during swallowing (via the epiglottis) and facilitates sound production.

Lower Respiratory Tract

1. Trachea (Windpipe):

- **Structure:** A tube supported by C-shaped cartilage rings, lined with ciliated epithelium and mucus-producing goblet cells.
- **Function:** Provides a clear airway to the lungs and filters debris.

2. Bronchi:

- **Structure:** Two main bronchi (left and right), branching into smaller secondary and tertiary bronchi.
- **Function:** Distribute air to each lung.

3. Bronchioles:

- **Structure:** Smaller branches of bronchi without cartilage, ending in alveolar ducts.

- **Function:** Control airflow resistance and air distribution within the lungs.

4. Alveoli:

- **Structure:** Tiny air sacs surrounded by capillaries, with thin walls for efficient gas exchange.
- **Function:** Site of oxygen and carbon dioxide exchange.

5. Lungs:

- **Structure:** Paired organs divided into lobes (3 on the right, 2 on the left due to the heart's position).
- **Function:** Expand and contract during breathing to facilitate gas exchange.

Associated Structures

1. Diaphragm:

- **Structure:** A dome-shaped muscle located below the lungs.
- **Function:** Primary muscle for respiration; contracts to draw air into the lungs.

2. Intercostal Muscles:

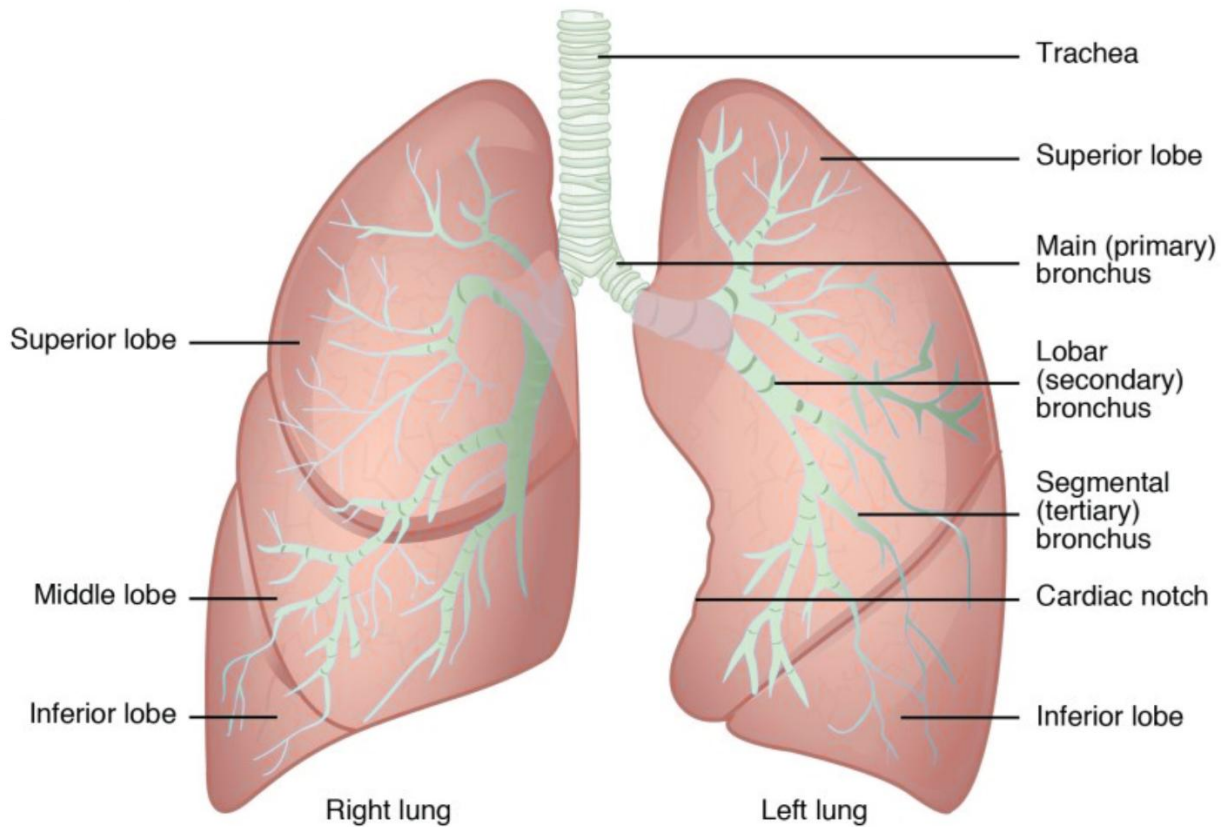
- **Structure:** Located between ribs.
- **Function:** Assist in expanding and compressing the thoracic cavity during breathing.

3. Pleura:

- **Structure:** Double-layered membrane surrounding each lung.
 - **Visceral pleura:** Covers the lungs.
 - **Parietal pleura:** Lines the chest wall.
- **Function:** Reduces friction during breathing and creates a pressure gradient for lung expansion.

Anatomy of lungs

- The lungs are essential respiratory organs located in the thoracic cavity, flanking the heart and mediastinum.
- They are primarily responsible for the exchange of oxygen and carbon dioxide between the air and the bloodstream.
- The anatomy of the lungs is both complex and designed to maximize efficiency in gas exchange.



External Anatomy

1. Number and Position:

- Humans have two lungs: a right lung and a left lung, housed within the ribcage.
- The right lung is larger with three lobes, while the left lung has two lobes to accommodate the heart's position.

2. Lobes:

- **Right Lung:** Divided into three lobes – superior, middle, and inferior – separated by the horizontal and oblique fissures.
- **Left Lung:** Divided into two lobes – superior and inferior – separated by the oblique fissure.

3. Pleura:

- The lungs are encased in a double-layered membrane called the **pleura**:
 - **Visceral Pleura:** Directly covers the lung surface.
 - **Parietal Pleura:** Lines the inner chest wall and diaphragm.
- The **pleural cavity** (space between the layers) contains lubricating fluid for smooth lung movement during respiration.

4. Hilum:

- The medial surface of each lung features the **hilum**, an opening through which the bronchi, blood vessels, lymphatic vessels, and nerves enter and exit the lung.

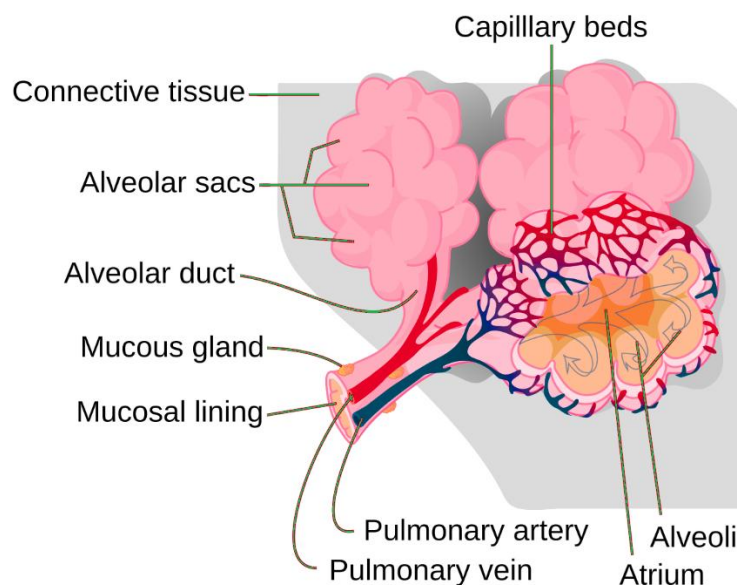
Internal Anatomy

1. Bronchial Tree:

- The **trachea** divides into:
 - Right and left main bronchi → branch into lobar bronchi → segmental bronchi → smaller bronchioles → terminal bronchioles.

2. Alveoli:

- Terminal bronchioles connect to **alveolar ducts**, leading to **alveolar sacs** containing **alveoli**.
- **Gas Exchange:** Occurs in the alveoli, where oxygen diffuses into the blood and carbon dioxide diffuses out via a thin capillary network.



3. Blood Supply:

- **Bronchial Arteries:** Provide oxygenated blood to lung tissues.
- **Pulmonary Arteries:** Deliver deoxygenated blood for oxygenation.
- **Pulmonary Veins:** Return oxygenated blood to the heart.

4. Lymphatics and Nerves:

- Lungs have a lymphatic system for fluid removal and immune defense.
- The **pulmonary plexus** supplies nerves for bronchial regulation.

Function in Respiration

1. Ventilation:

- The mechanical process of moving air into and out of the lungs, facilitated by the **diaphragm** and **intercostal muscles**.

2. Gas Exchange:

- Takes place in the alveoli:
 - **Oxygen** diffuses into the blood.



FREE PREVIEW

[Click here to visit our website](#)

PHARMACY PREMIUM NOTES

Complete subject
and semesters are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHopeNotes

Instagram

@firsthope.official

[Click here to follow >](#)

YouTube channel

FirstHope-Pharmacy / Live streams

[Click here to watch >](#)

WhatsApp channel

Follow FirstHope on WhatsApp

[Click here to join >](#)

FirstHope website

firsthopenotes.com

[Click here to visit >](#)

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.