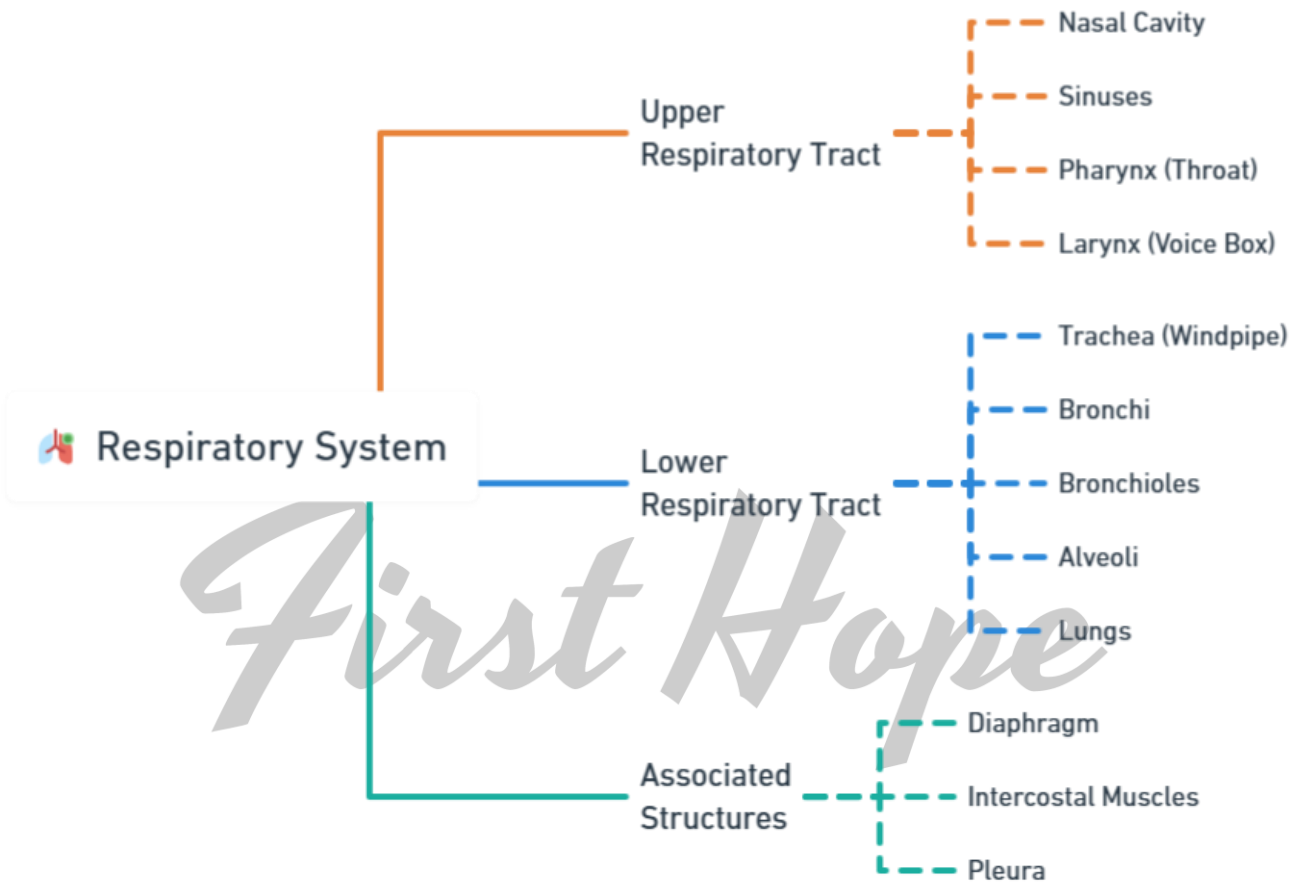
Respiratory System

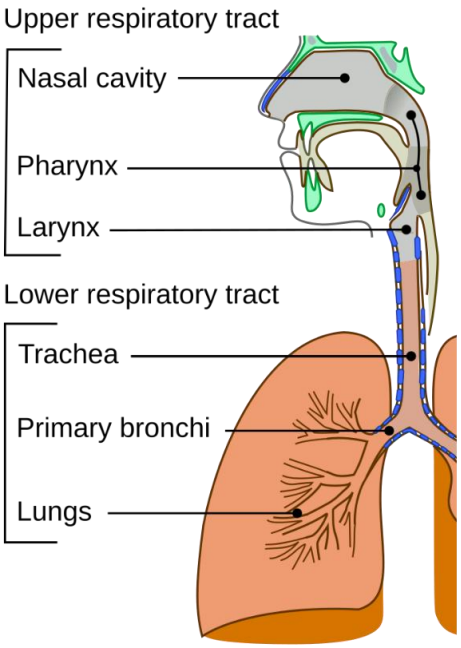
Anatomy of Respiratory System

- 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:



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Upper Respiratory Tract



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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.

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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.

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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.

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