

Human Physiology

Lect. No. 8

Physiology of the Respiration

Prof. Nader Abo-Tubikh (PhD-Dundee)

Mazaya University College

Department Medical Lab Technology

Main Function & Requirements

Main Function of Respiratory System is:

- To rid the body of CO₂ and to provide O₂.

Requirements to do this:

1. A moist and thin exchange surface.
2. Huge gas exchange surface (75 m²).
3. Muscular pumps to pull air over the exchange surface.

Functions of the Respiratory System

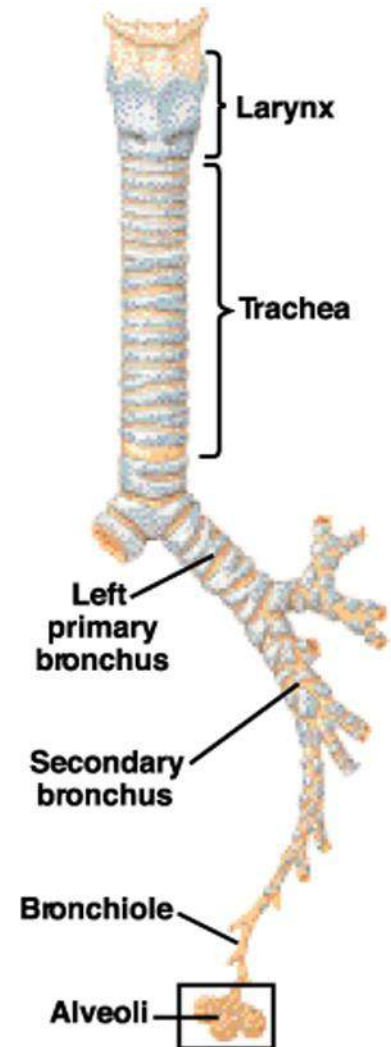
1. Exchange of gases between the atmosphere and the blood.
2. Regulation of body pH.
3. Protection from inhaled pathogens & irritants.
4. Motor functions (Vomiting & Coughing)

Structure of the Respiratory System

1. The Conduction System

Air passageways: Air enters the upper respiratory tract and passes into:

1. The **pharynx**, a common passageway for both ingested materials and air.
2. The **larynx** and the **trachea**, or (windpipe).
3. The trachea subdivides into a pair of primary **bronchi**, one for each lung.
4. Within the lung, the bronchi branch to become **bronchioles**.
5. The bronchioles continue to branch until they end at the **exchange surface (Alveoli)**.



	Name	Division	Diameter (mm)	How many?	Cross-sectional area (cm)
Conducting system	Trachea	0	15-22	1	2.5
	Primary bronchi	1	10-15	2	↓
	Smaller bronchi	2	1-10	4	
		3			
		4			
		5			
		6-11		1×10^4	
Bronchioles	12-23	0.5-1	2×10^4	100	
Exchange surface			8×10^7	5×10^3	
	Alveoli	24	0.3	$3-6 \times 10^8$	$>1 \times 10^6$

The diameter of the airways becomes progressively smaller as they branch, but cross sectional area becomes larger.