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Class : 11th Biology
Chapter- 17 : Breathing and Exchange of Gases

Breathing and Exchange of Gases

Respiratory organs in animals

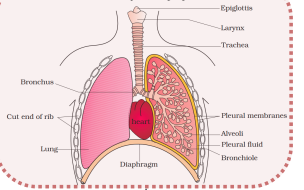
Body surface
Examples - sponges, coelenterate, flatworm

Tracheal tube
Examples - Insects, centipede, millipede etc.

Gills
Example - Fishes, tadpoles, prawn etc.

Lungs
Example - Terrestrial animals like human being

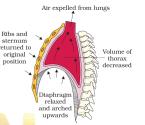
Human respiratory System



Respiratory disorders
- Occupational Respiratory Disorders
- Emphysema
- Asthma
- Bronchitis
- Pneumonia
- Lung cancer

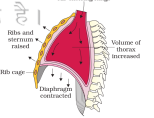
Regulation of Respiration
- Neural regulation- Involves respiratory centers, afferent and efferent nerves.
- Chemical regulation- Through chemoreceptors.

Mechanism of Breathing

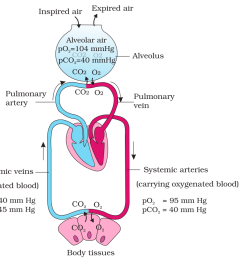


Expiration (Breathing out)

Inspiration (Breathing in)



Exchange of Gases
- Between blood and tissues
- Between Alveoli and blood



Transport of Gases

Transport of O_2
- As blood plasma (About 3 %)
- As oxyhaemoglobin (About 97%)

Transport of CO_2
- As Carbonic acid (About 7 %)
- As carbamino- haemoglobin (About 20-25 %)
- As bicarbonates (About 70%)

$$CO_2 + H_2O \xrightleftharpoons{\text{Carbonic anhydrase}} H_2CO_3 \xrightleftharpoons{\text{Carbonic anhydrase}} HCO_3^- + H^+$$

Respiratory volumes and capacities
- Tidal volume → 500 ml
- IRV → 2500 ml to 3000 ml
- ERV → 1000 ml to 1100 ml
- RV → 1100 ml to 1200 ml
- IC → TV + IRV
- EC → TV + ERV
- FRC → ERV + RV
- VC → ERV + TV + IRV
- Total lung capacity
→ RV + ERV + TV + IRV or V.C + TRV

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