

Vocabulary / Topics / & Study Questions for Respiratory System (lecture)

Trachea	Use Boyle's Law to explain how pressure changes occur and how this results in pulmonary ventilation.
Bronchial tree	
Bronchioles	
Alveoli	What would happen to pressures if you were to receive a stab wound between the ribs and it pierced all the way into one of your lungs?
Upper Respiratory Tract	
Lower Respiratory Tract	
Atmospheric pressure (aka ambient air pressure, aka barometric pressure)	
Intrapulmonary pressure (aka alveolar)	Explain why inhalation is an active process and exhalation
Intrapleural pressure	
Intrapleural cavity	Explain why intrapleural pressure is always negative, regardless of whether you are inhaling or exhaling.
Lung recoil	
Surface Tension	
Surfactant	What are the two major forces tending to cause lungs to collapse?
Respiratory membrane	
Boyle's Law	
Inspiration (aka inhalation)	What is the single major force preventing lungs from collapsing?
Expiration (aka exhalation)	
Pleural effusion	
Pleurisy	Why are breathing difficulties more common in premature newborns than those who go full term? What is the treatment for these babies?
Atelectasis	
Pneumothorax	
Tension pneumothorax	
Hemothorax	What is the standard treatment for pneumothorax?
Hemopneumothorax	
RDS, IRDS, HMD	Is breathing easier or more difficult when lung compliance is high?
Pulmonary edema	
Diaphragm	
Intercostal muscles	Explain how each of the four key factors influences lung compliance and therefore the ease of ventilation.
Conducting Zone structures	
Respiratory Zone structures	
Alveolar macrophages	
Lung Compliance	

Dalton's Law of Partial Pressures

partial pressure

Henry's Law

partial pressure gradient

external respiration

internal respiration

ventilation perfusion coupling

diffusion

hemoglobin, Hb

oxyhemoglobin, HbO₂

deoxyhemoglobin, Hb

carbaminohemoglobin, HbCO₂

carbonic acid, H₂CO₃

carbon monoxide, CO

carboxyhemoglobin

bicarbonate ion, HCO₃⁻

cyanosis, cyanotic

affinity

eupnea

apnea

hypoventilation vs. hyperventilation

compensatory vs. noncompensatory

hypocapnia vs. hypercapnia

ischemia

hypoxia

acidosis

alkalosis

chemoreceptors, central vs. peripheral

hypoxic drive

asthma

lung cancer

COPD

obstructive emphysema

chronic bronchitis

tuberculosis, TB

Calculate the partial pressures (PP) of O₂ and CO₂ in ambient air at sea level where ambient air pressure is 760 mm Hg. Do the same at ambient air pressures of 700 mm Hg and 600 mm Hg.

Note that the partial pressures of O₂ and CO₂ in atmospheric air are substantially different from those in alveolar air even before any exchange of gases occurs. Why?

Would diseases such as lung cancer, TB, pneumonia, emphysema, etc most directly affect external respiration or internal respiration?

Explain the principle of ventilation-perfusion coupling.

Write all three chemical reactions involved in the transport of CO₂. Note that the reactions proceed one direction at the lungs and the opposite direction at the tissues.

Write the two chemical reactions involved in the transport of O₂. Note that the reactions proceed one direction at the lungs and the opposite direction at the tissues.

Give an example of when hypoventilation is compensatory and when it is not.

Give an example of when hyperventilation is compensatory and when it is not.

Explain the progression of carbon monoxide poisoning and its treatment.

Explain all the various factors that can influence your respiratory control centers to adjust RR and/or depth.

Describe the effects of narcotics and alcohol on the respiratory control centers.

If blood levels of CO₂ rise, RR should _____

If blood levels of O₂ rise, RR should _____

If blood pH increases, RR should _____

If blood levels of CO₂ rise, pH should _____