

# RESPIRATORY SYSTEM



# PRIMARY FUNCTIONS

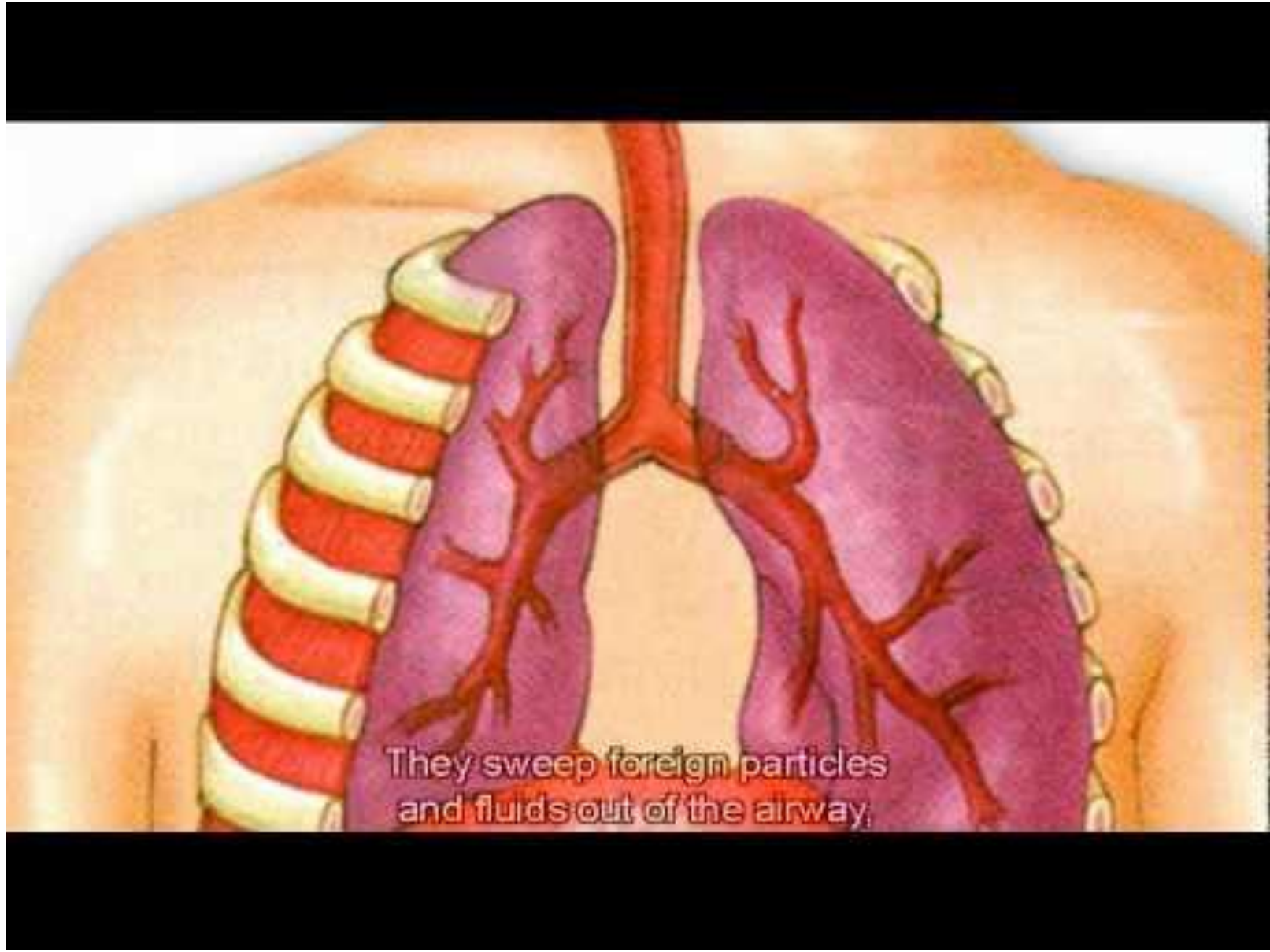
- Exchange gases (oxygen and CO<sub>2</sub>)
- Produce vocal sounds
- Sense of smell
- Regulation of blood PH



# Respiration - process of gas exchange

1. Movement of air into lungs
2. Gas exchange between blood and air  
(external respiration)
3. Gas transport in blood
4. Gas exchange between blood and body cells  
(internal respiration)

\*Cellular Respiration - oxygen use and CO<sub>2</sub> production at a cellular level



# Organs of the Respiratory System

## Conducting Passages

Main organs  
of the upper  
and lower  
respiratory  
system

Upper respiratory tract

Nasal cavity

Pharynx

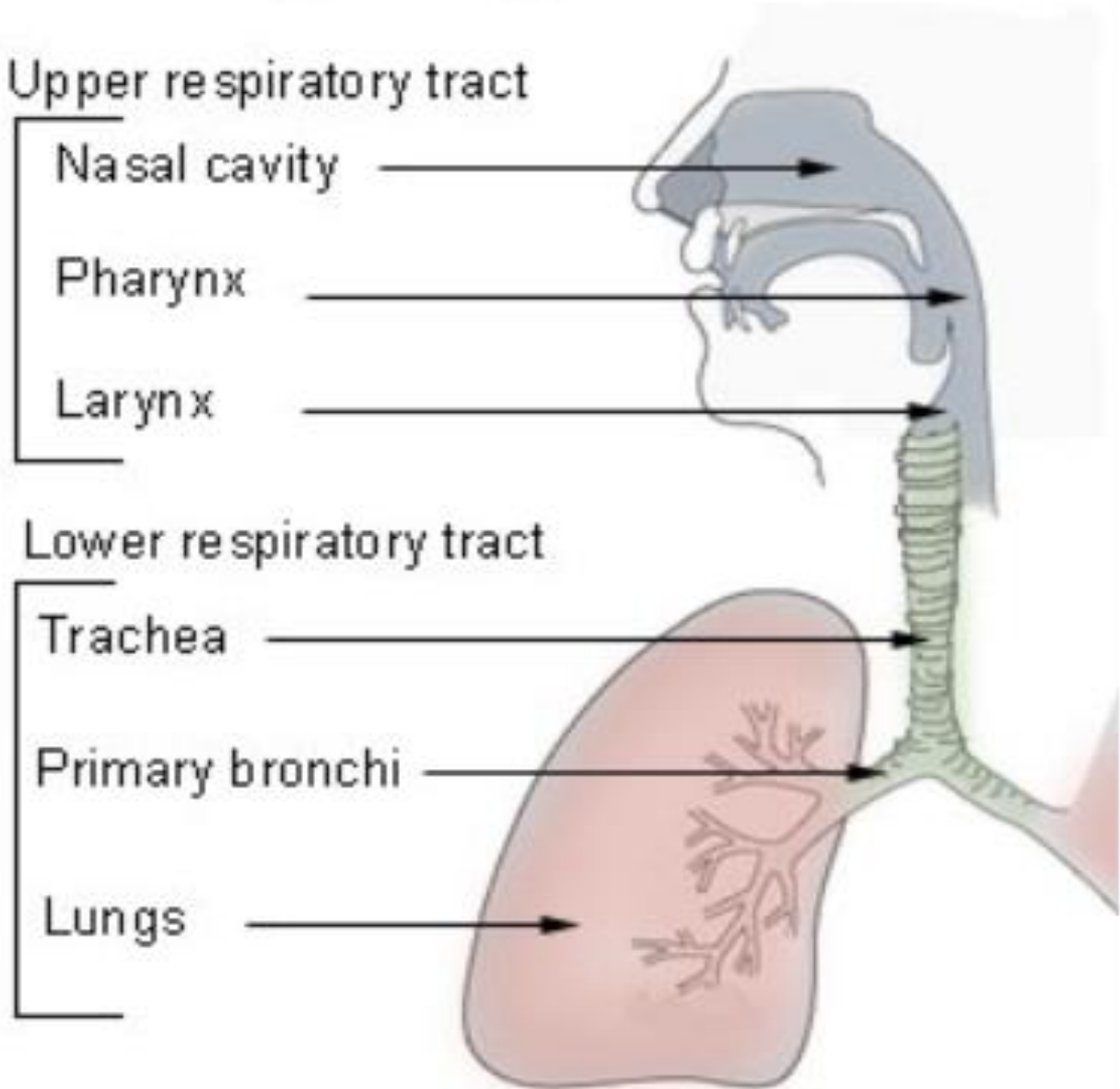
Larynx

Lower respiratory tract

Trachea

Primary bronchi

Lungs

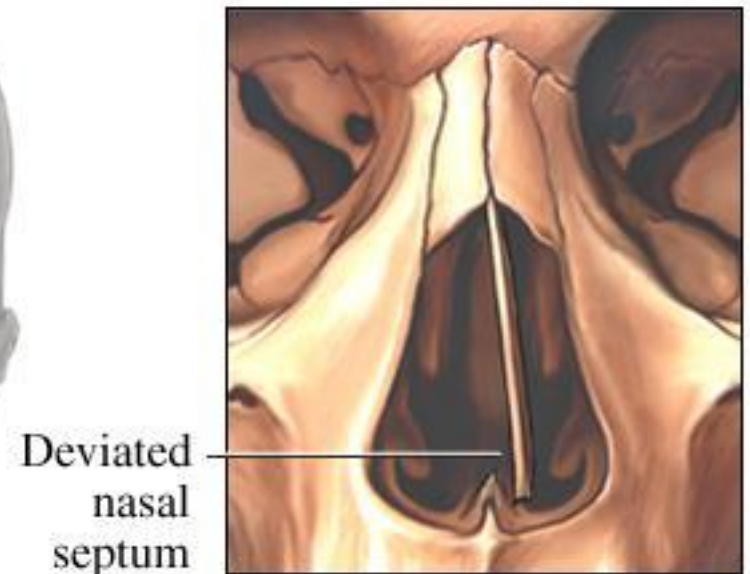
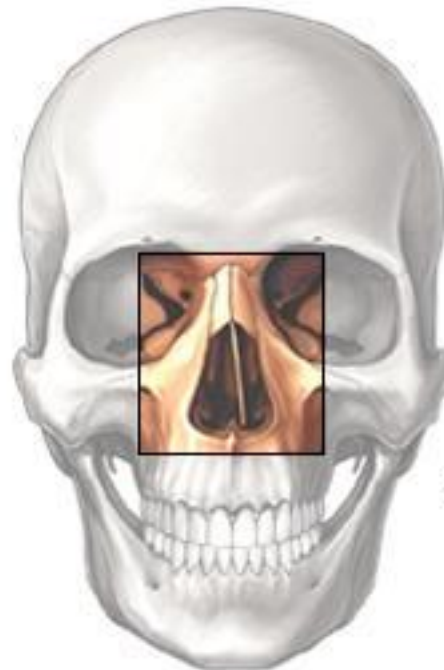




The NOSE bones and cartilage support nose, two openings (nostrils), hair filters large particles

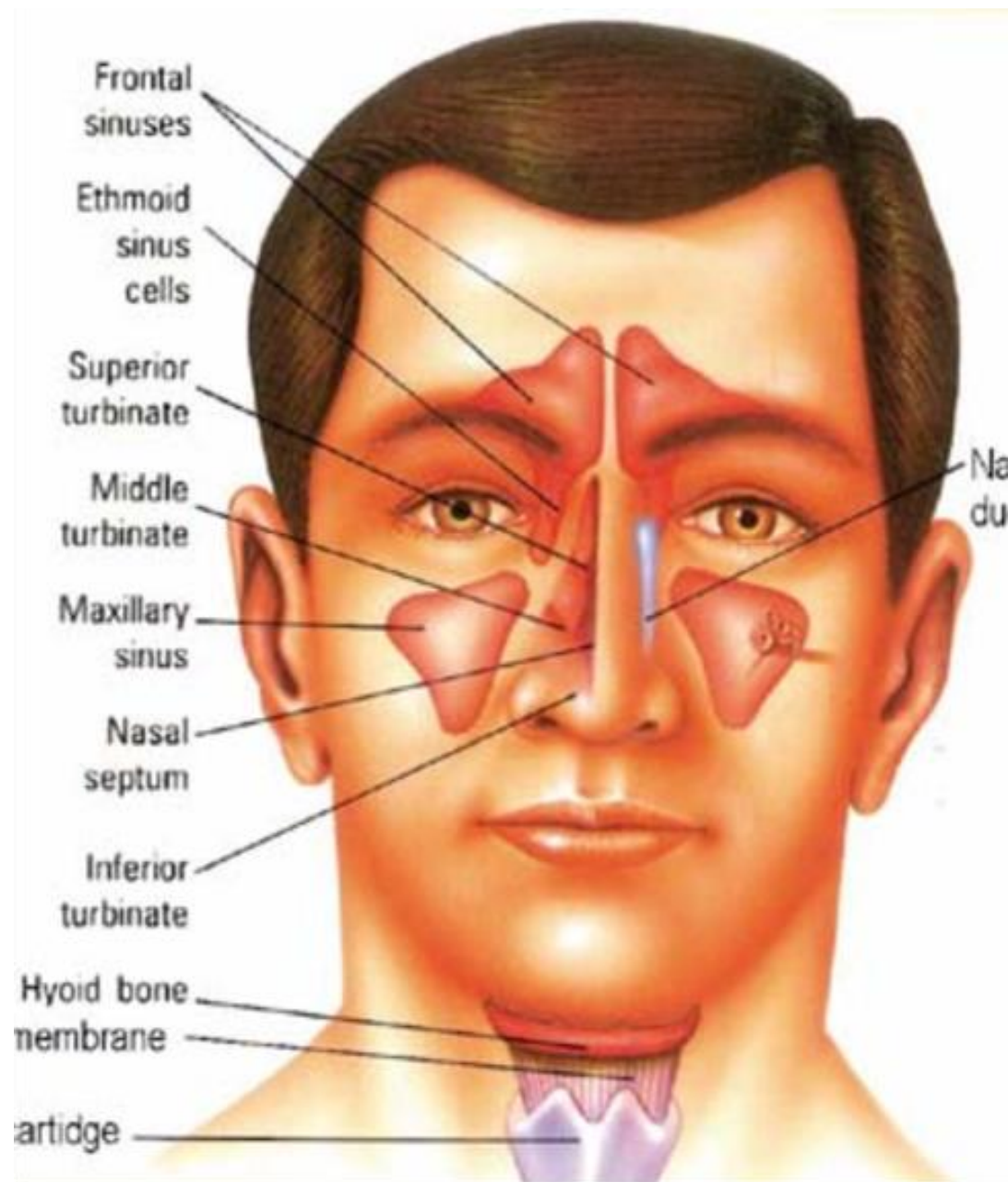
Nasal Cavity – hollow space behind the nose

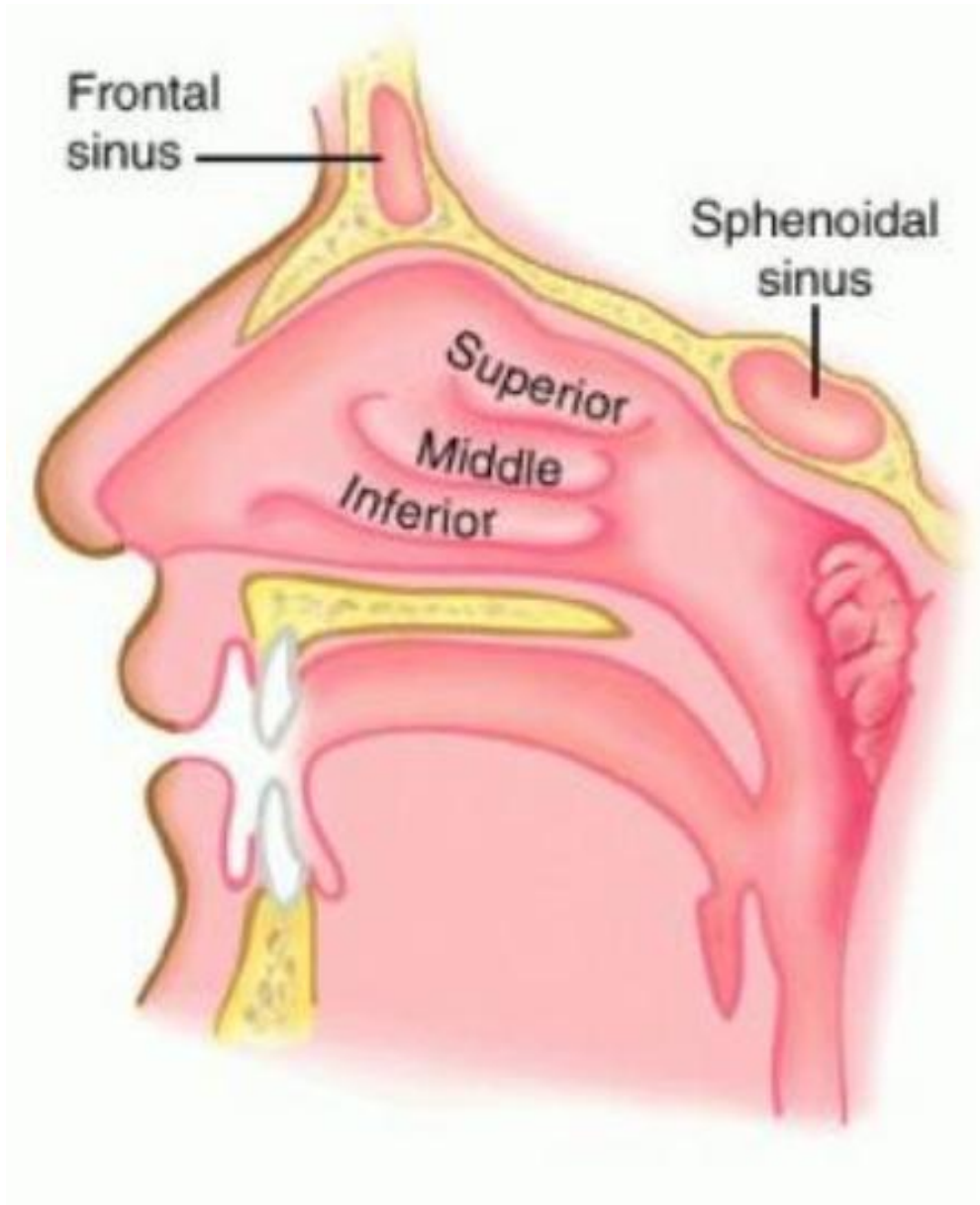
Nasal septum – divides the nose (bone)



# Paranasal Sinuses - spaces within the bones

JOB: to reduce the weight of skull and are resonant chambers for voice.



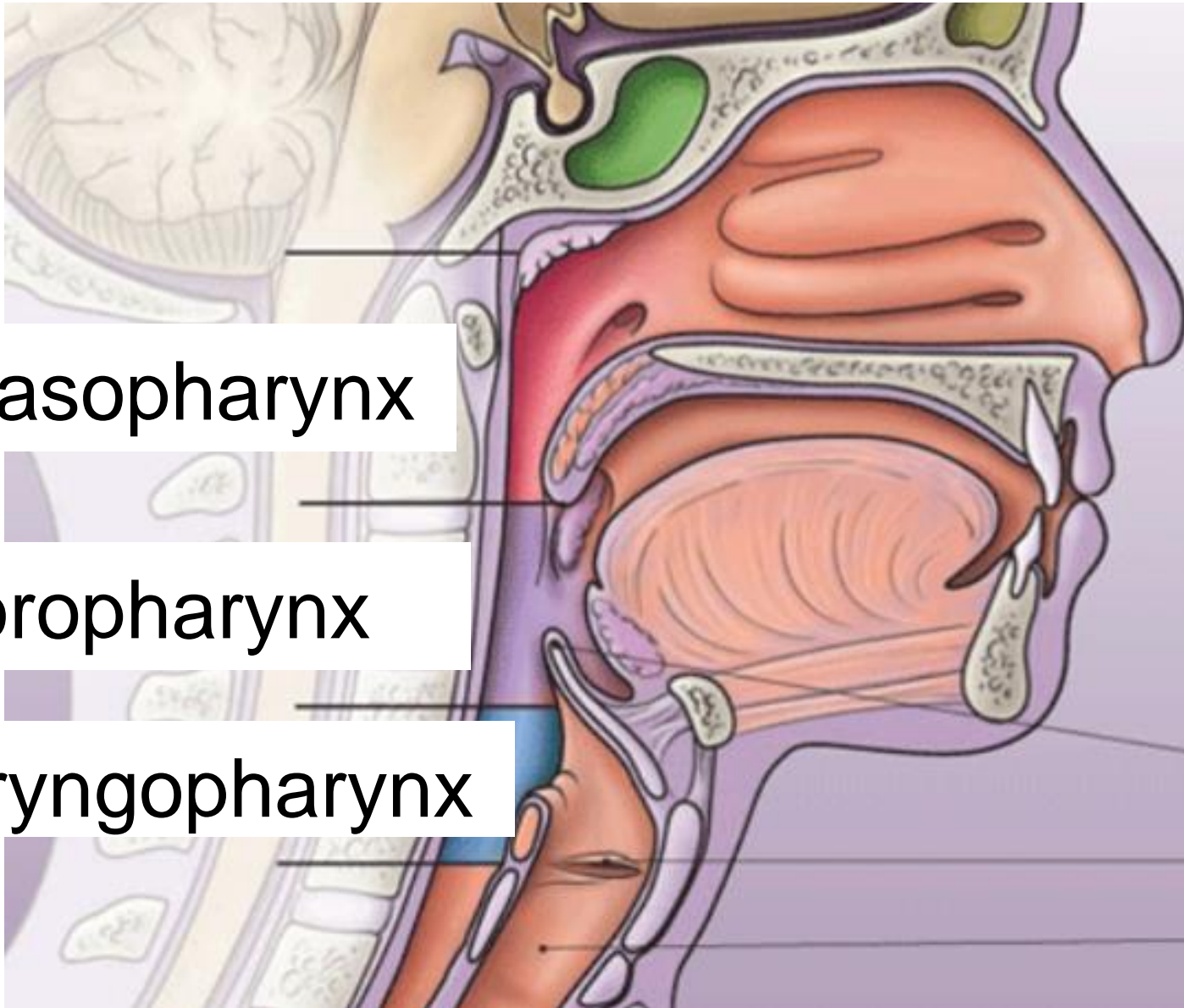


Warming of air and inclusion of Mucus Membrane - warms and moistens air, also traps particles (dust)

\*particles go to stomach



Pharynx – behind the oral cavity, between the nasal cavity and larynx (space, not a structure)



nasopharynx

oropharynx

laryngopharynx

Epiglottis

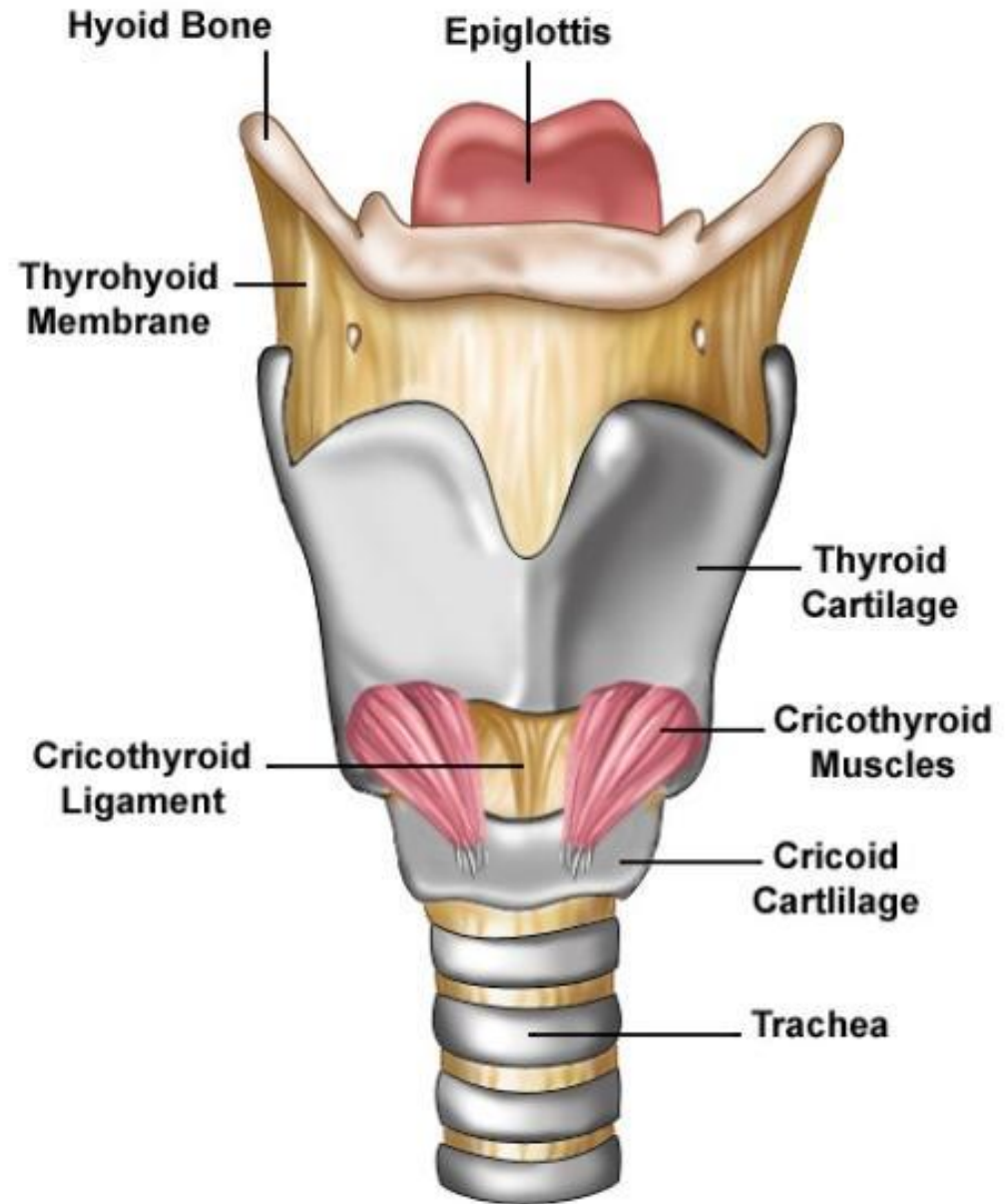
Vocal folds

Trachea

# Larynx –

enlargement at the top of the trachea and below pharynx, conducts air in and out of trachea, houses vocal cords

composed of muscles and cartilages



- false vocal folds (do not produce sound) – help close airway during swallowing
- true vocal folds (produce sound) – changing shape of the pharynx, and oral cavity changes sounds into words
- Contracting and relaxing muscles changes pitch (increased tension = higher pitch)

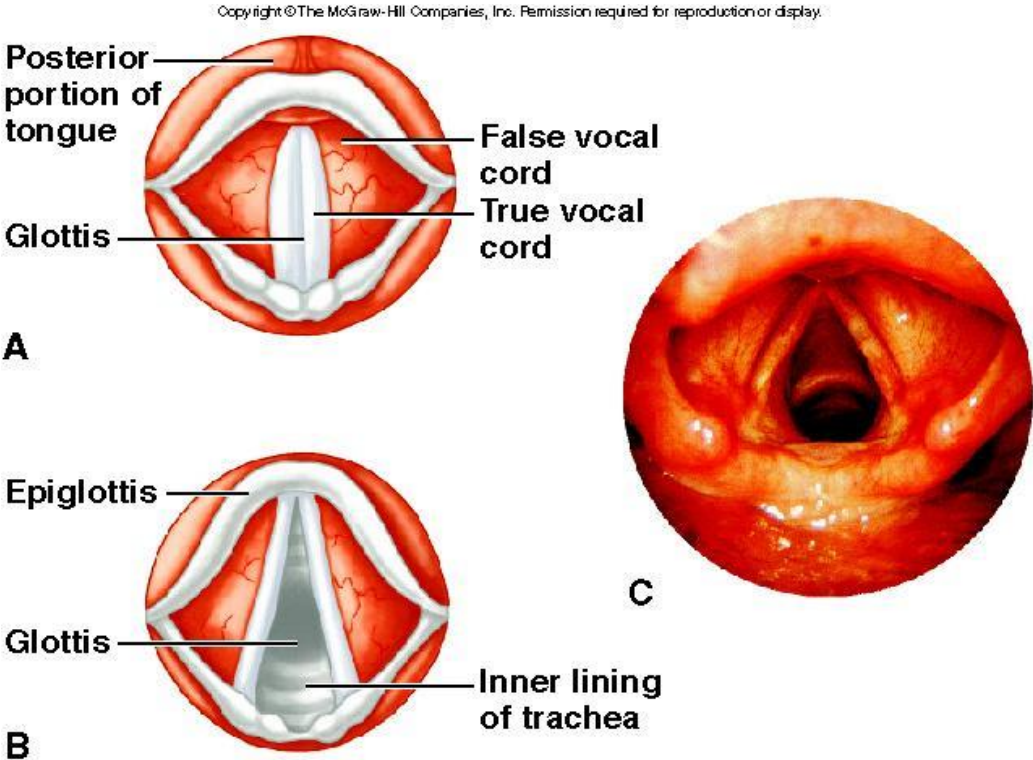
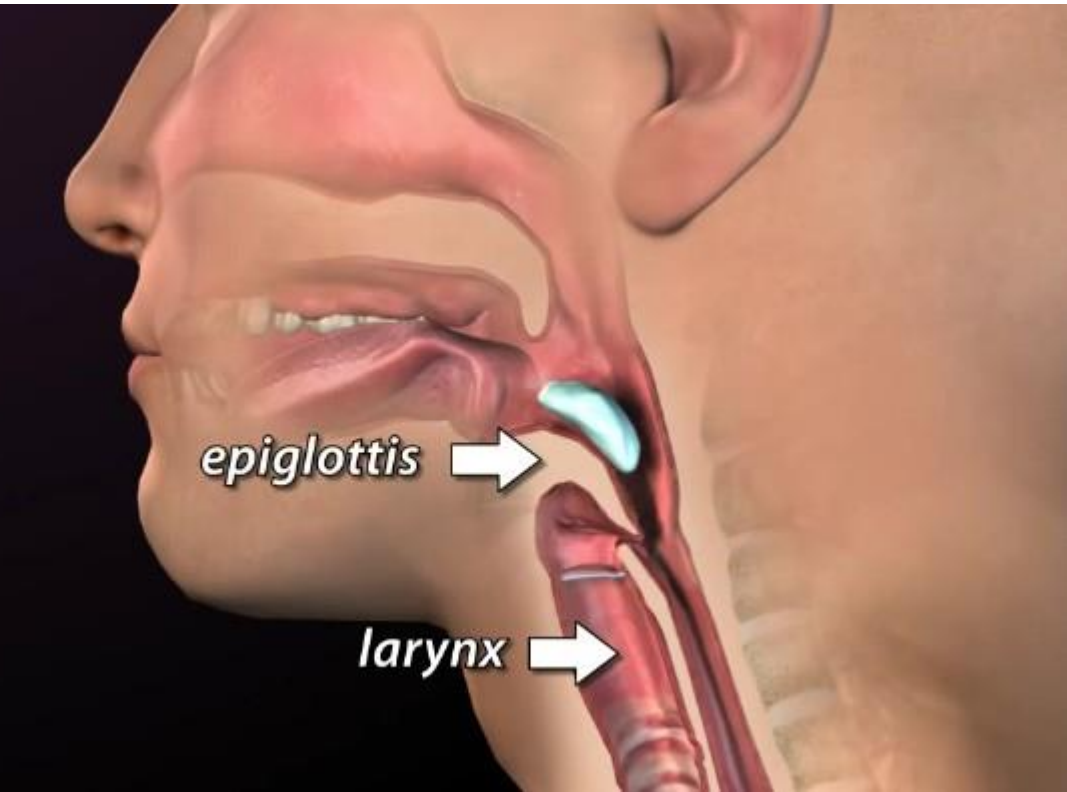
Glottis





Glottis – triangular slit that opens during breathing/talking, and closes during swallowing

Epiglottis – flaplike structure that stands upright, allows air to enter larynx, during swallowing it presses downward and prevents food from entering air passages

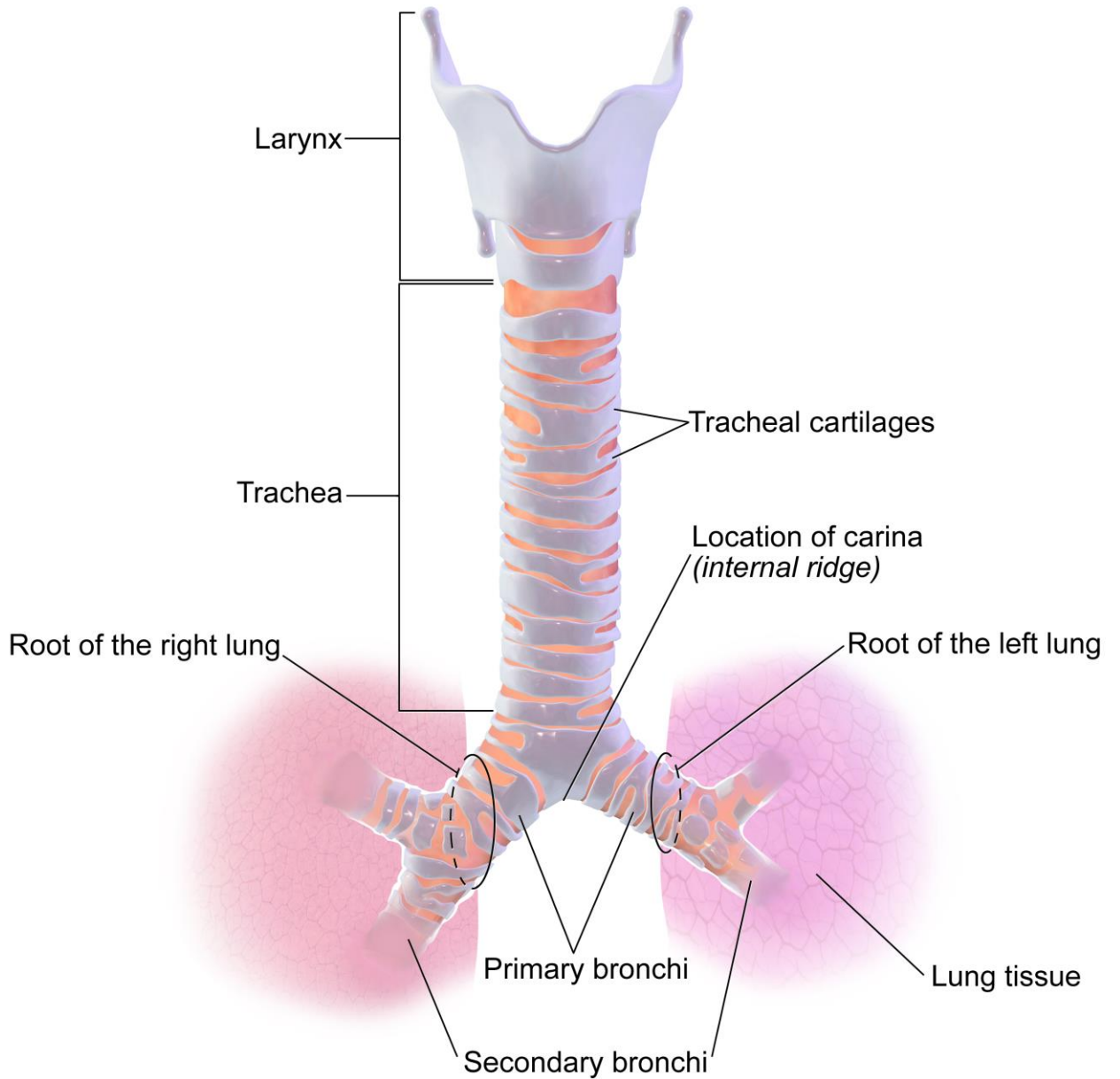




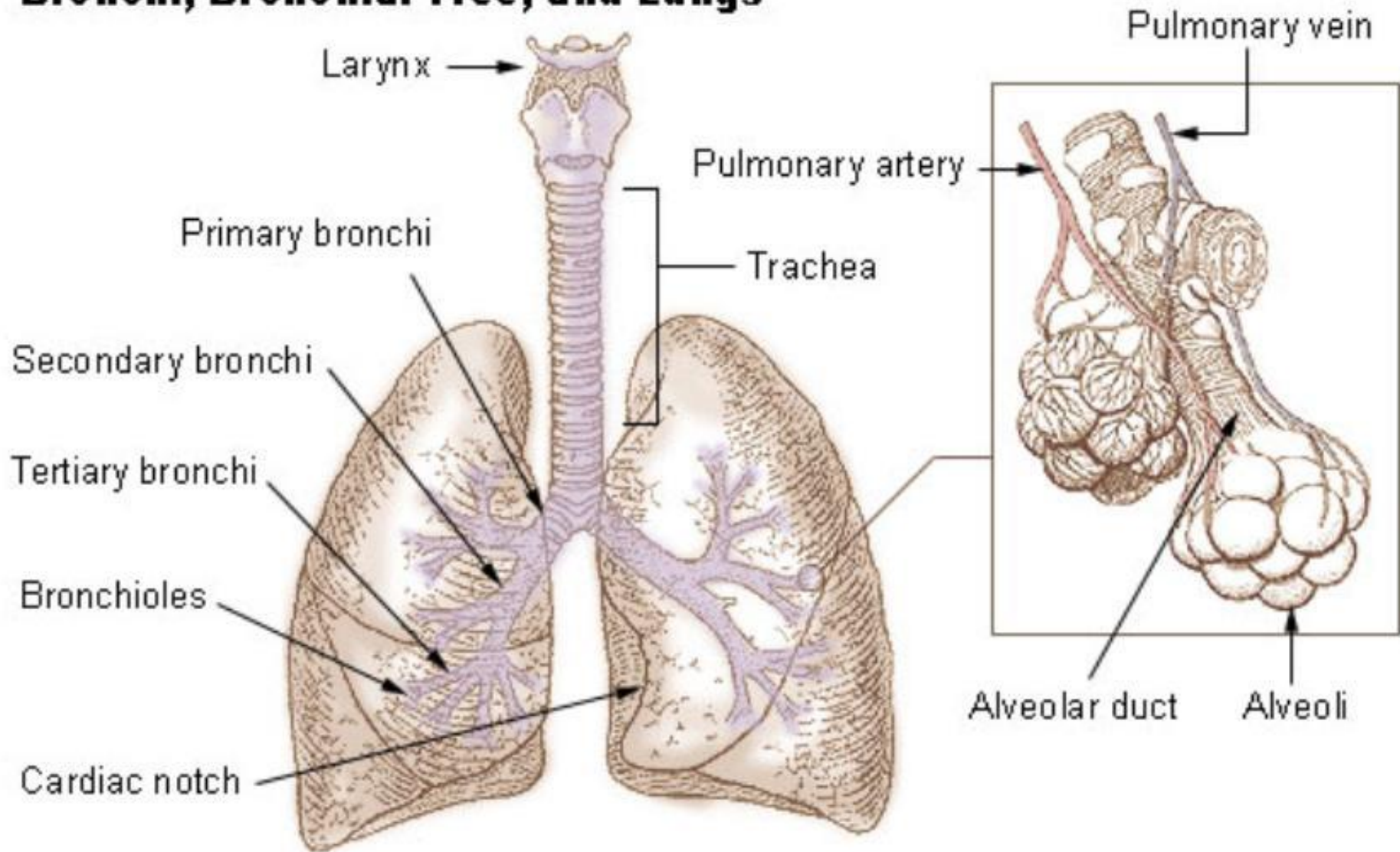
# Trachea

Connects larynx to lungs

## Anatomy of the Trachea

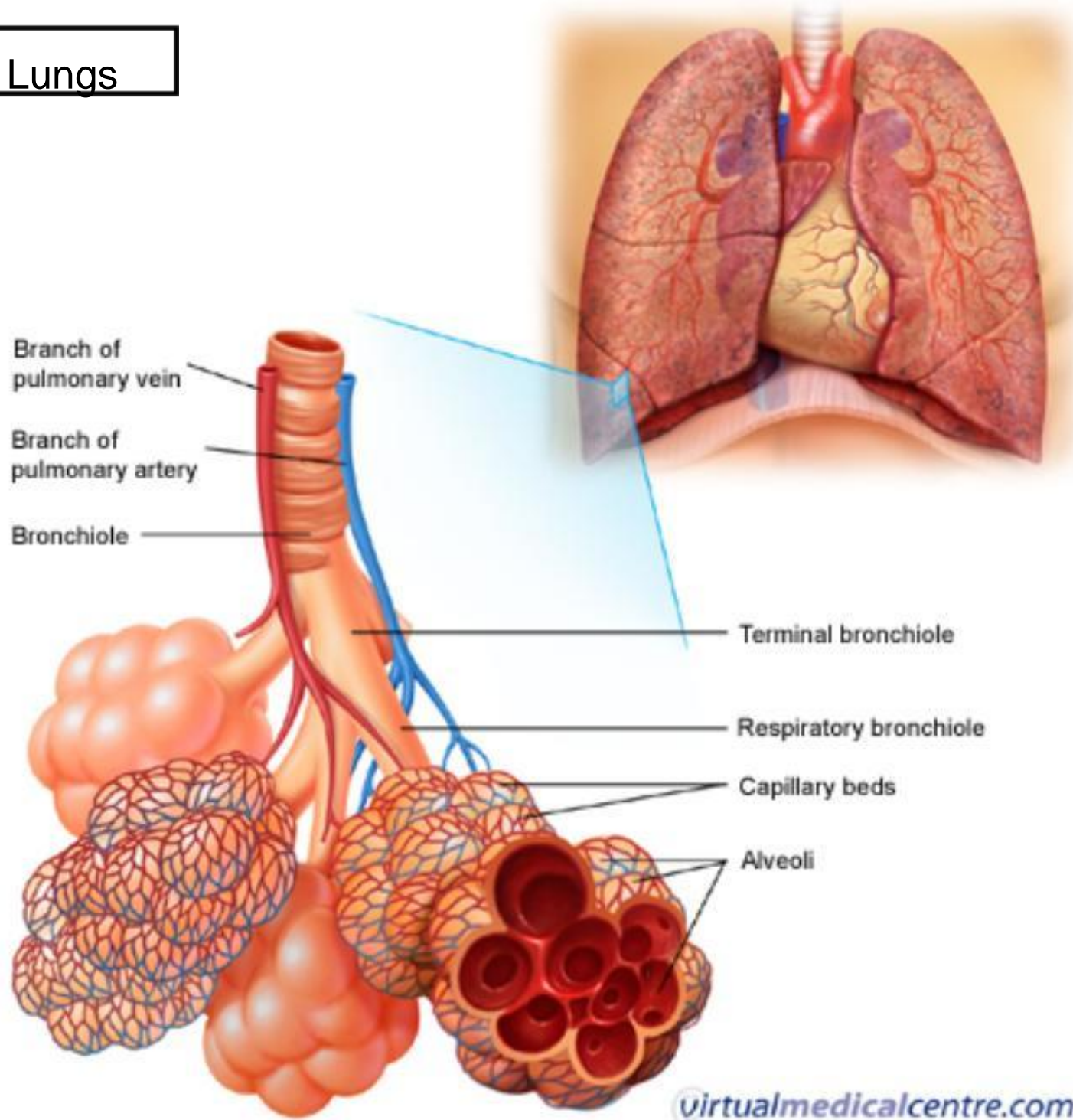


# Bronchi, Bronchial Tree, and Lungs

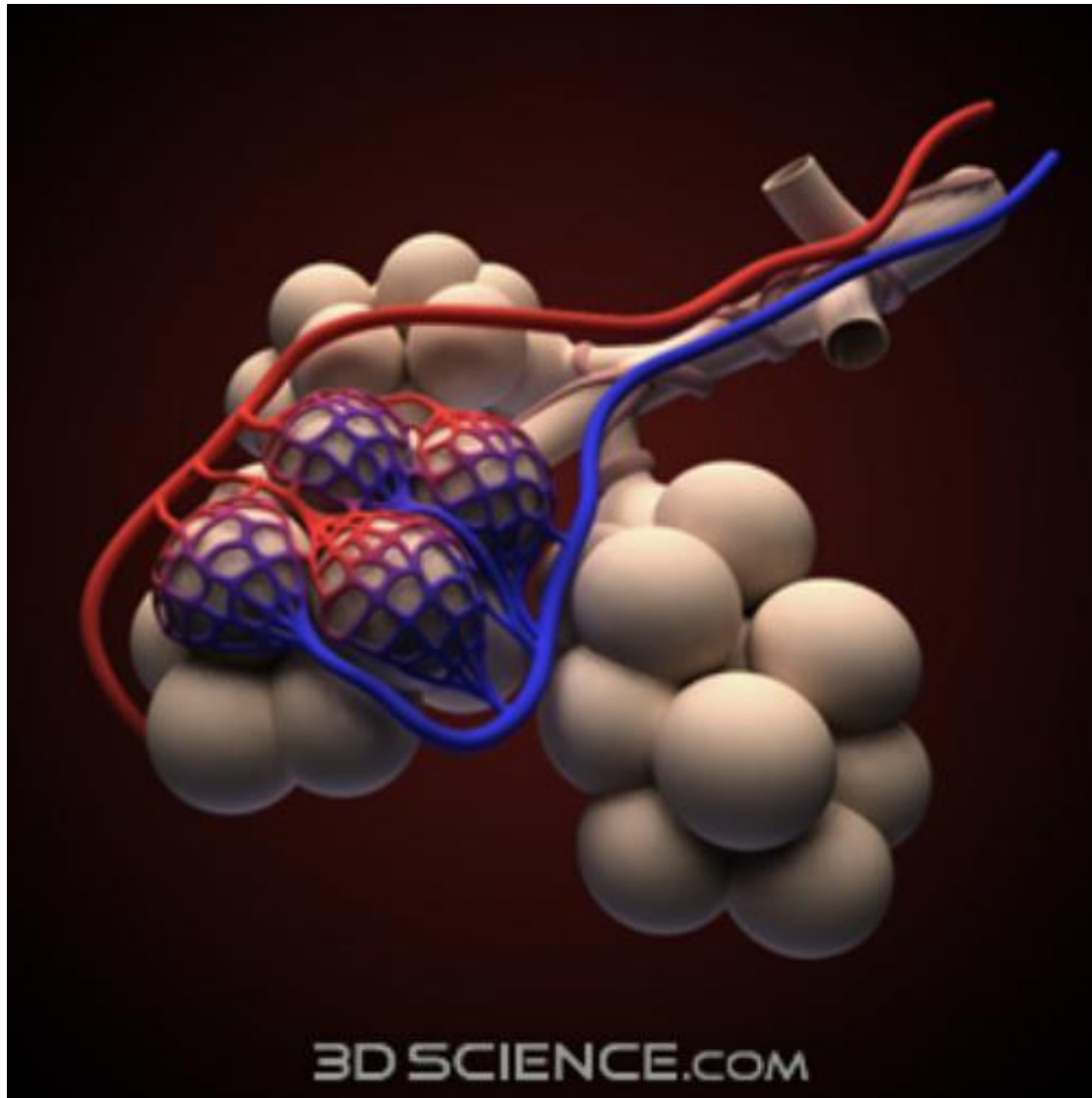


**Primary bronchii > bronchioles > alveoli**

# Alveoli & Lungs

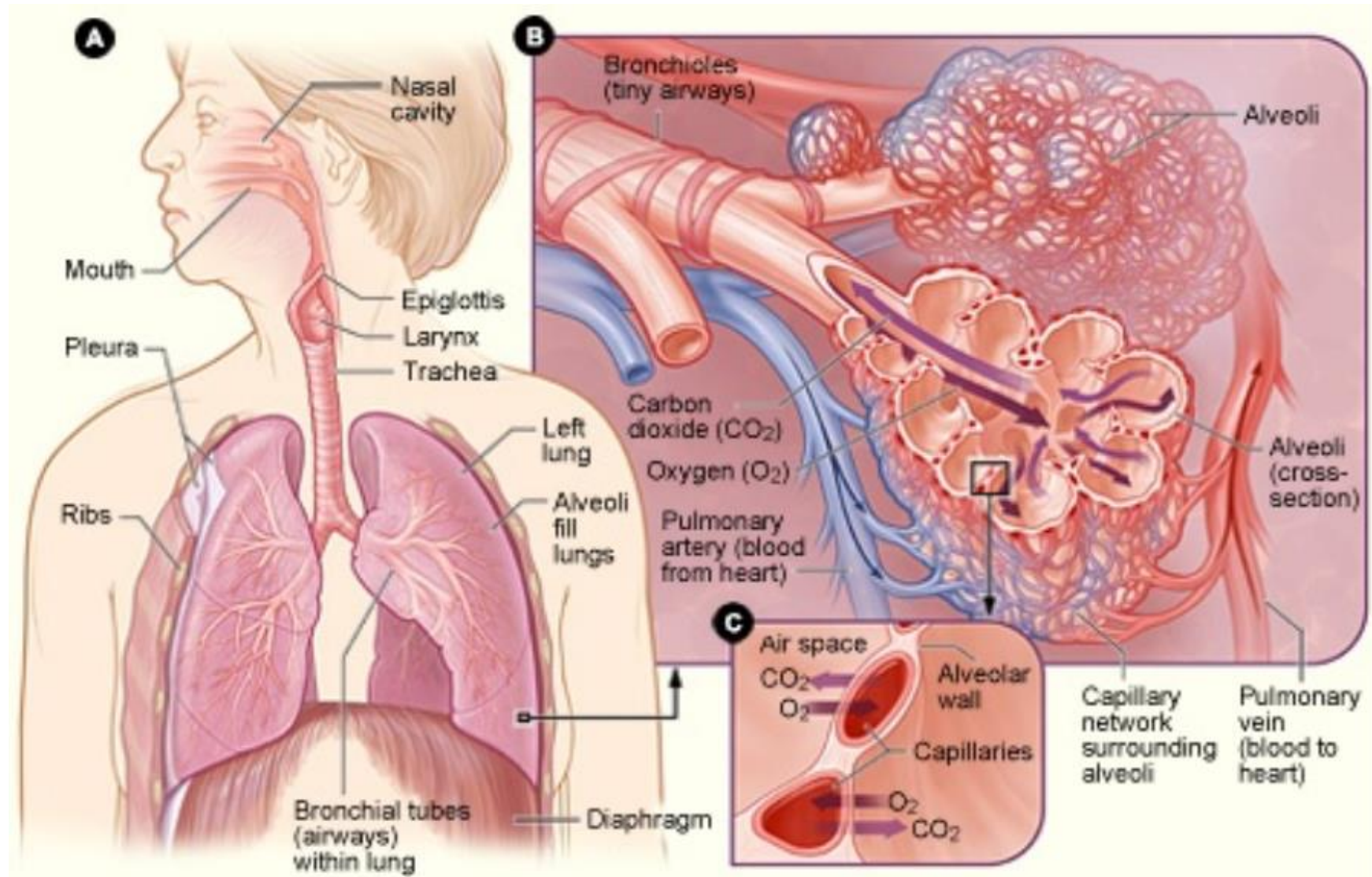


# ALVEOLI





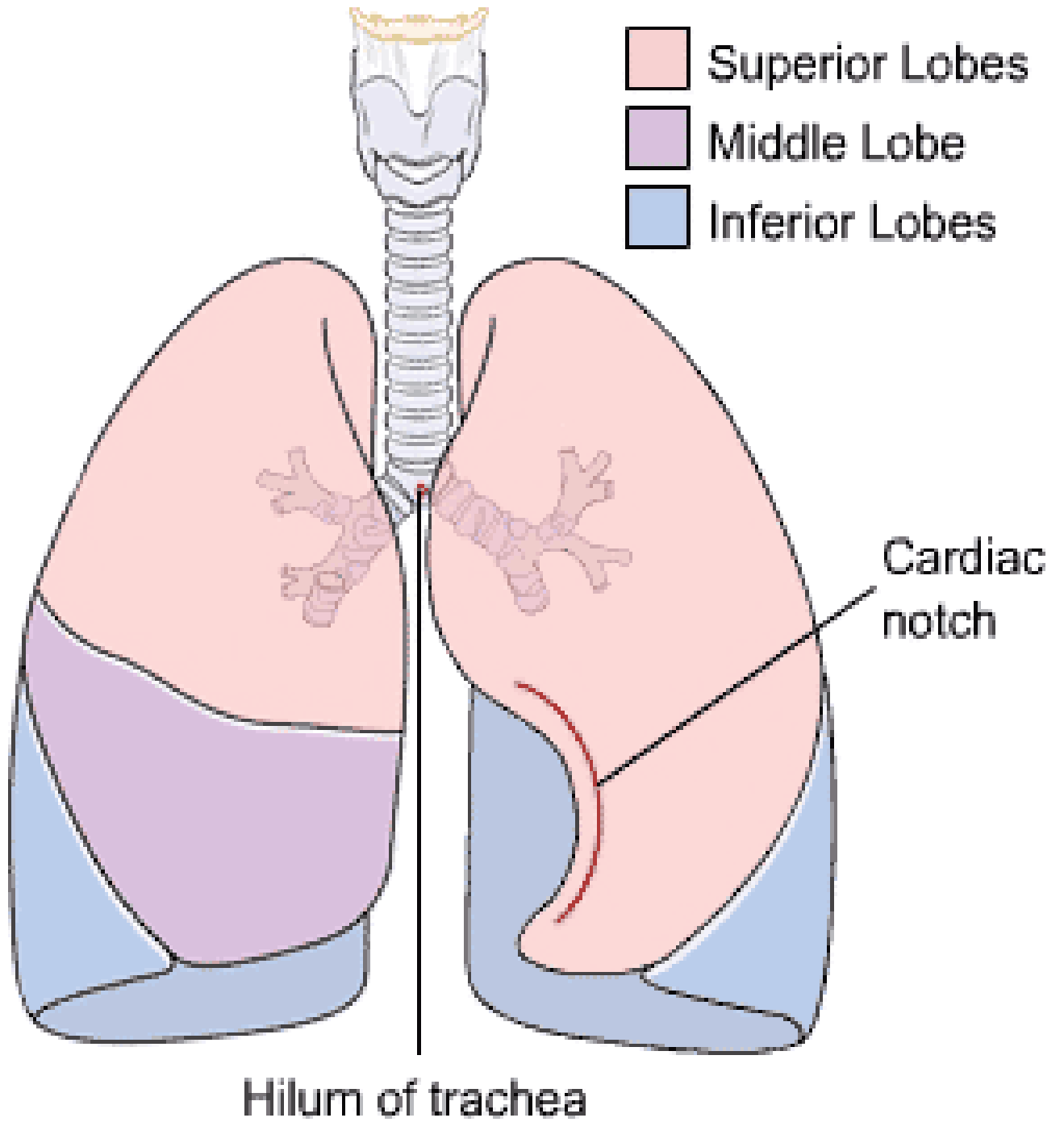
# LUNGS - spongy tissue that sit within the pleural cavity



Right Lung  
= 3 lobes

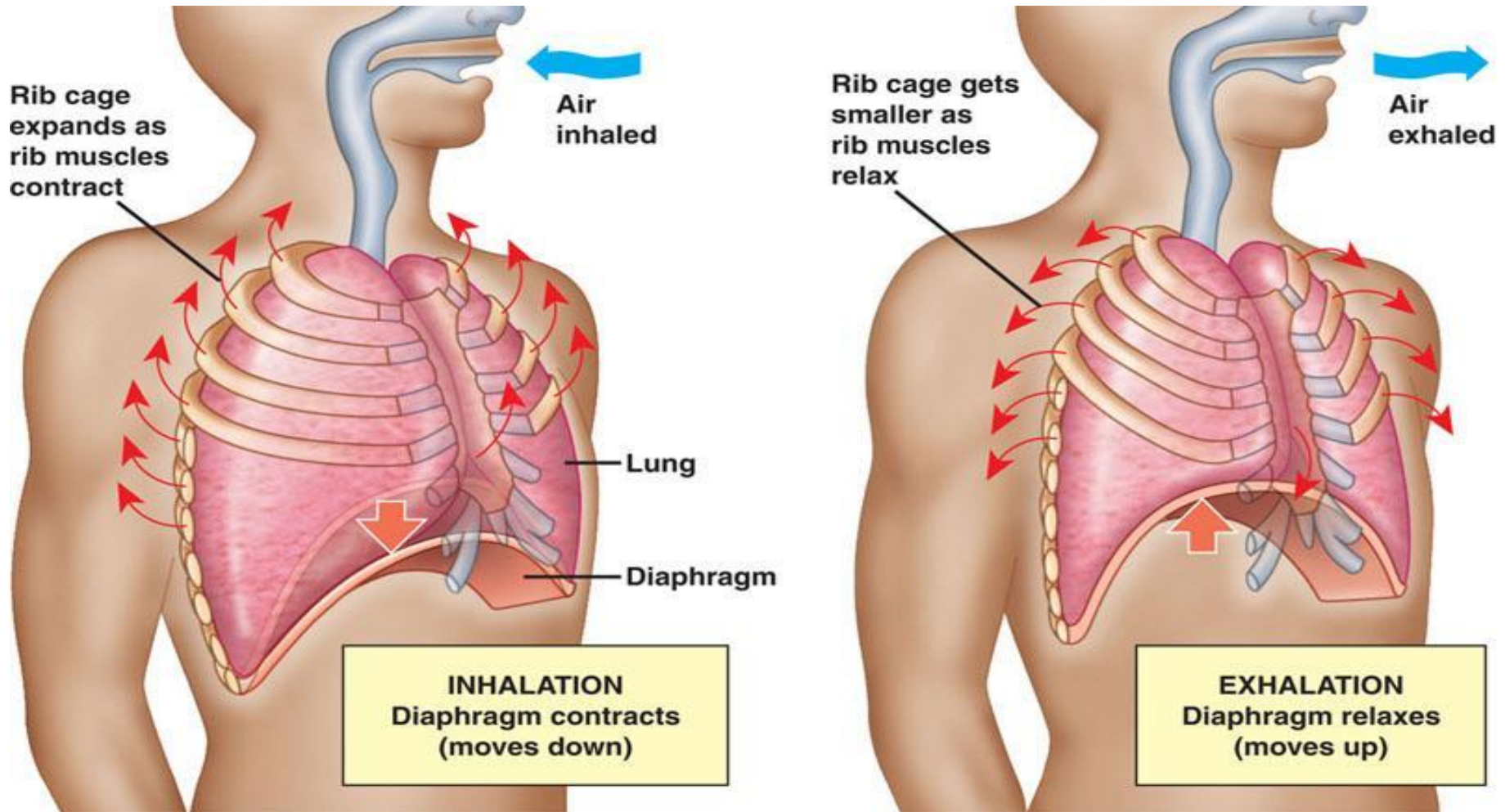
Left Lung  
= 2 lobes

Serous fluid  
lubricates lungs  
during breathing



# Breathing

Diaphragm contracts than releases





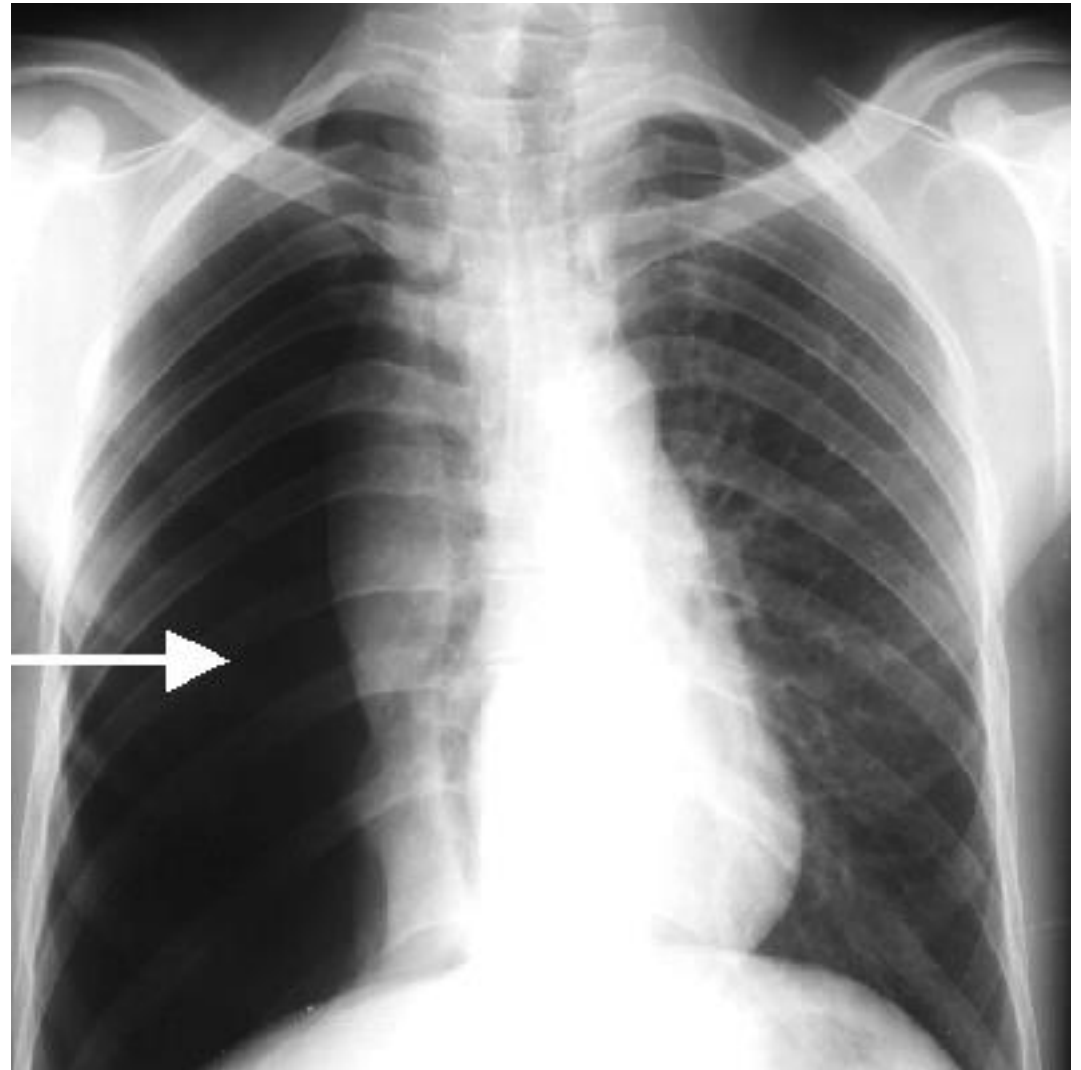


# ATMOSPHERIC PRESSURE = 760 Hg

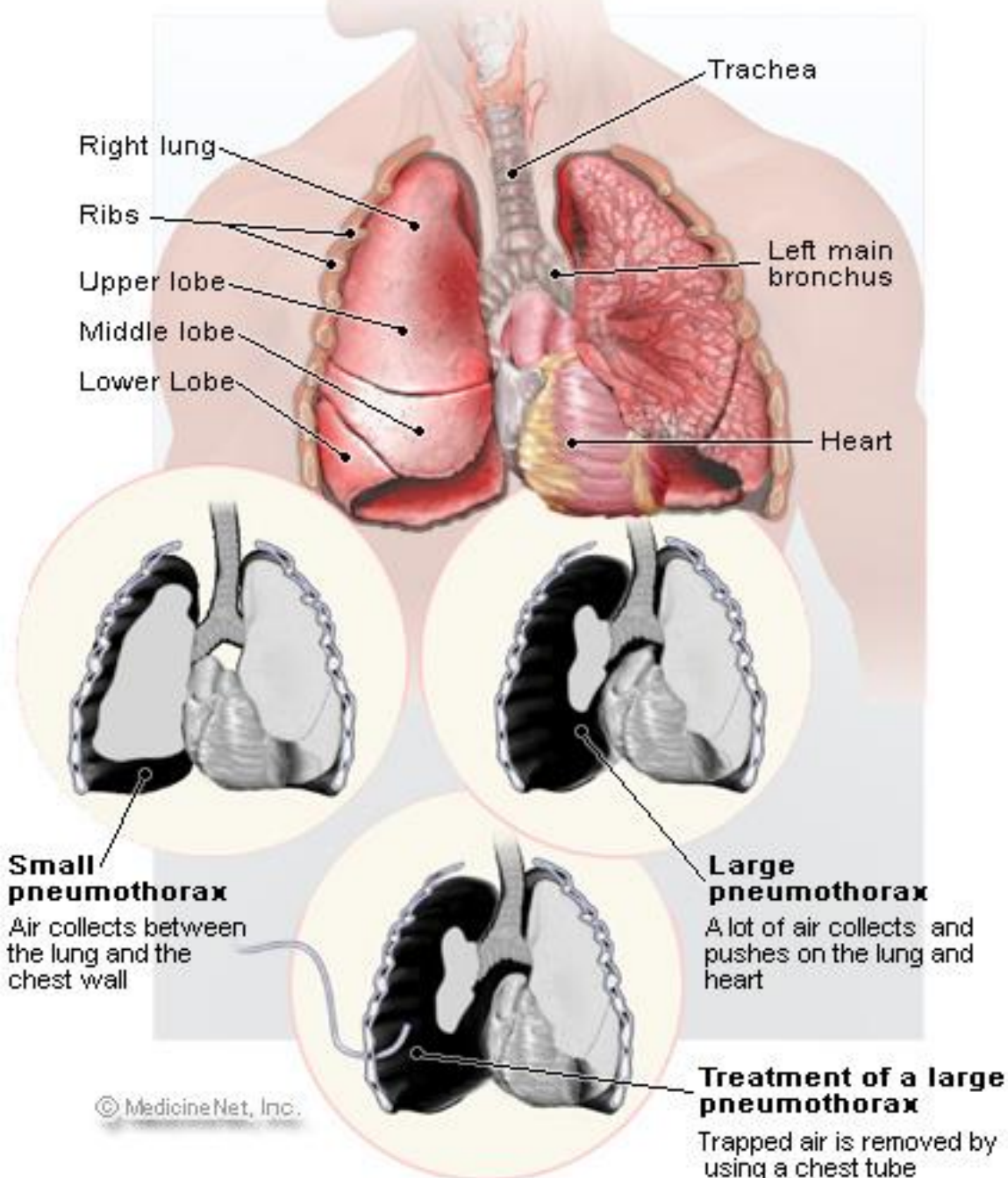
**Pressure** is necessary for breathing, which is why it is difficult to breathe in high altitudes and also why a punctured lung can be dangerous.

A hole in the pleural cavity can cause the lung to collapse or deflate

Pneumothorax  
= collapsed lung



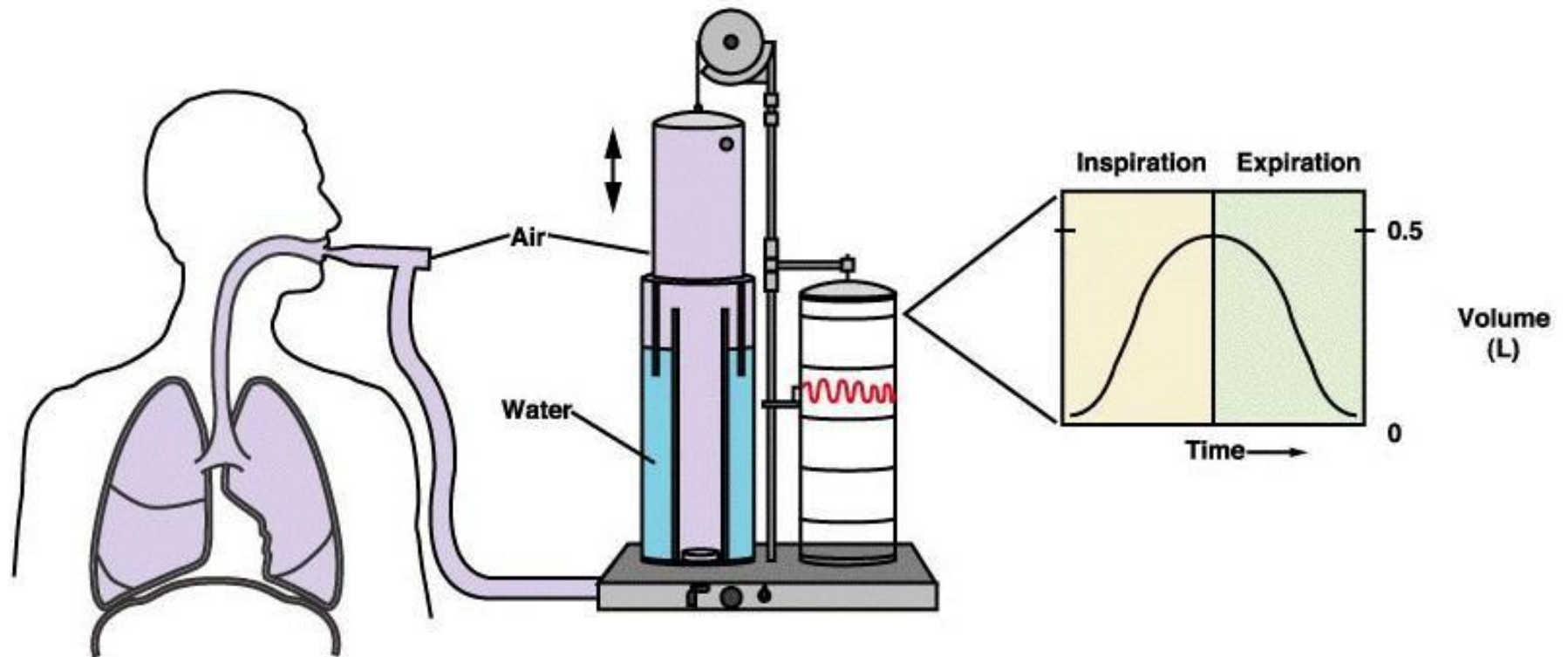
# Pneumothorax



# Respiratory Air Volumes

**Spirometry** - measures the amount (volume) of air moving in and out of the lungs

Respiratory Cycle - 1 inspiration and 1 expiration



# Factors Affecting Breathing

\*Chemosensitive areas – detect concentrations of chemicals like carbon dioxide and hydrogen

1. Rise in CO<sub>2</sub>
2. Low blood oxygen (peripheral chemoreceptors, carotid and aortic bodies, sense changes)
3. Inflation reflex – regulates the depth of breathing, prevents overinflation of the lungs
4. Emotional upset, fear and pain

