(XVII.) PNEUMOGRAPHY

Anatomy of respiratory system

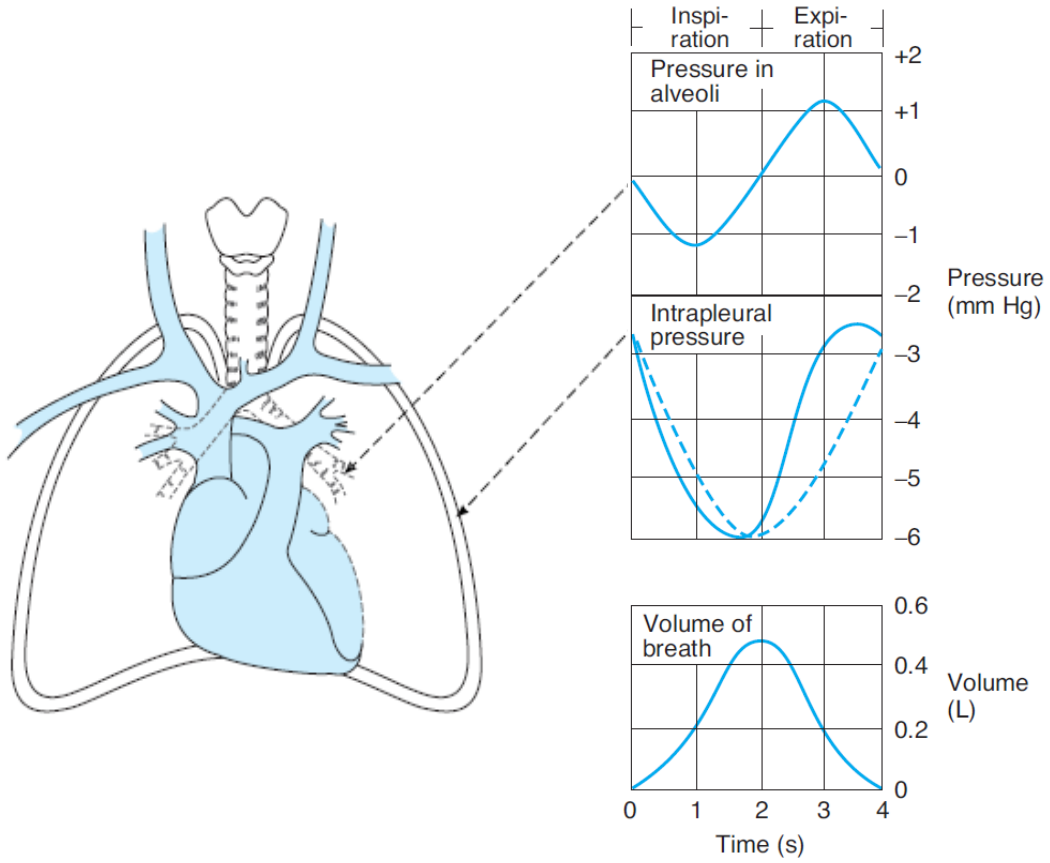
Respiratory system

- ***Airways***
  - Upper airways
  - Lower airways
- ***Lungs***

Respiratory muscles

- ***Inspiratory muscles***
  - Diaphragm
  - External intercostal muscles
- ***Accessory inspiratory muscles***
  - Scalene and sternocleidomastoid muscles
- ***Expiratory muscles***
  - Internal intercostal muscles; abdominal muscles

Changes of intrapleural and intraalveolar pressure (related to atmospheric pressure) during inspiration and expiration



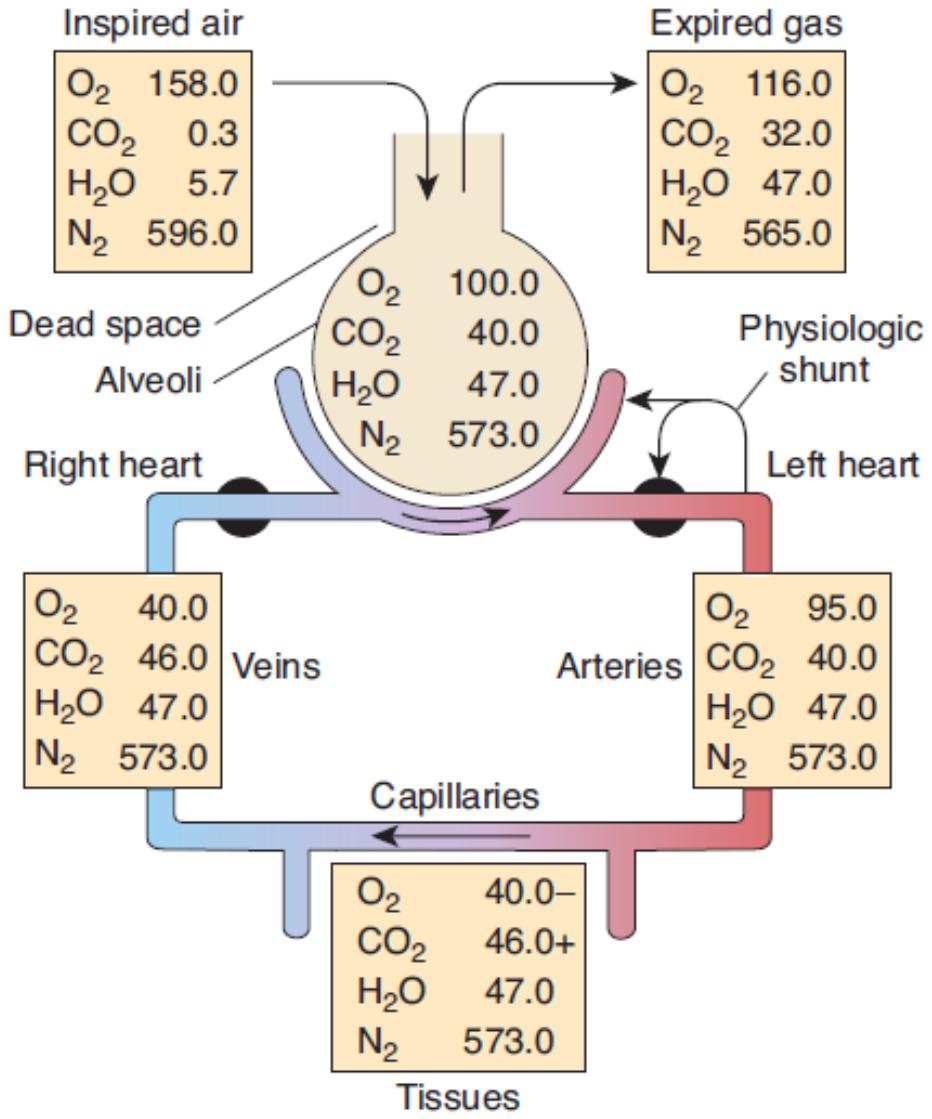
Inspiration

- Active process – contraction of respiratory muscles
- Decrease of intrapleural pressure
- Decrease of intraalveolar pressure
- Due to pressure gradient, air flows into lungs

Expiration

- Passive process (quiet expiration) – elasticity of thoracic wall and lungs
- Increase of intrapleural and intraalveolar pressure
- Air flows out of lungs

Partial pressures of gases (mm Hg) in various parts of the respiratory system and in the circulatory system

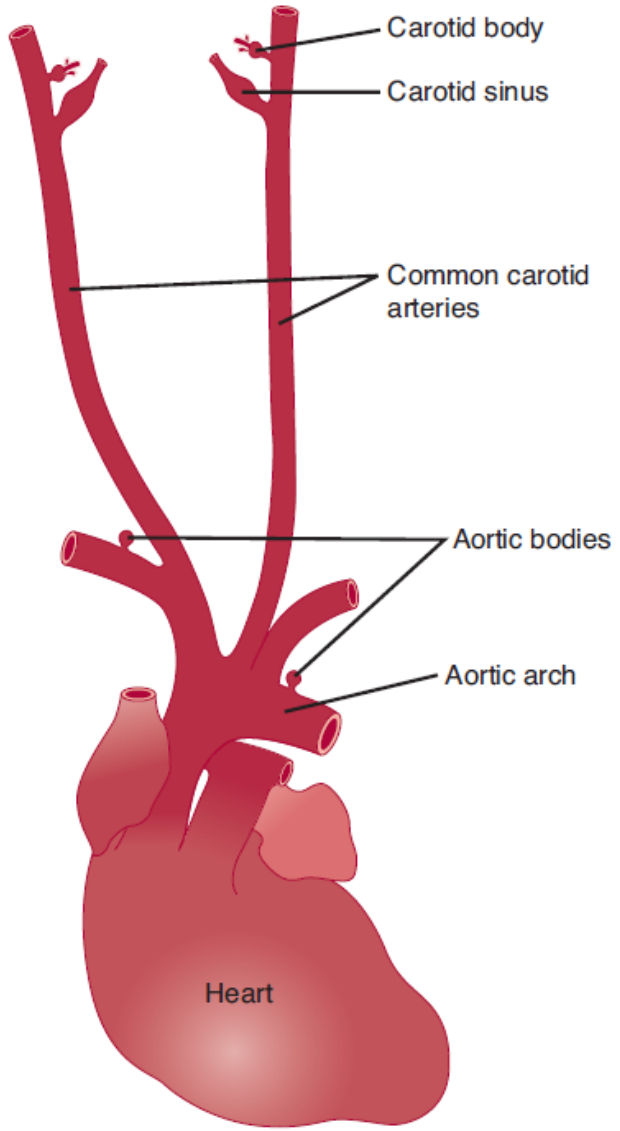


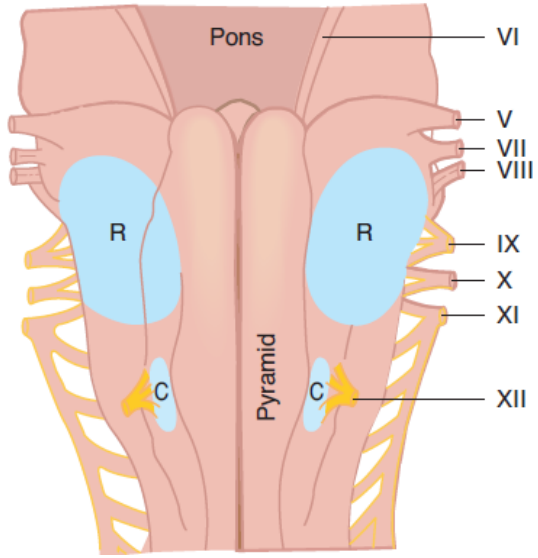
Chemical control of breathing

Chemoreceptors

- Peripheral
- Central

- Changes of **pCO_2 (pH)** or **pO_2**
- Changes of activity of respiratory neurons





Equipment

- one/two respiratory belts for registration of respiratory movements
- PowerLab system

Procedure

Record:

- Resting respiration (1 min)
- Respiration after a mild exertion (5 squats – 10 breathing cycles)
- Respiration after an intensive exertion (30 squats – 10 BC)

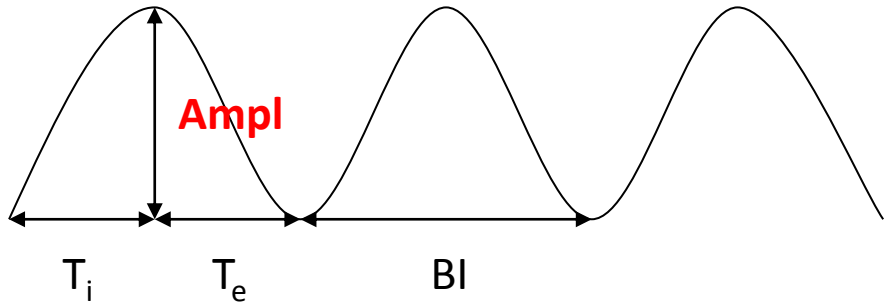
Evaluation

Following parameters in 6 chosen breathing cycles in each recorded situation

T_i - duration of inspiration (s)
T_e - duration of expiration (s)
BI - duration of whole breathing cycle (breathing interval = Ti+Te) (s)
Ampl - amplitude of breathing movements (V=volt)

- Create a table, calculate arithmetic means and standard deviations

- **Examples of tables and help with calculation - click on the icone PractLesCalc on the computer monitor**



Statistical analysis of obtained data

Choose two sets of data which will be analyzed

Follow the procedure in textbook