Respiratory System

Primary and secondary tasks of the lung

Structure of the respiratory system

Anatomy of the lung: macroscopic and microscopic:

* Se figur 12.1
* Näshålan, farynx, larynx, trakea, diafragma, pleura
* Partietalt blad, visceralt blad, huvudbronker, lobulära och segmentella bronker, respiratoriska bronkioli, terminala bronkioli, alveolargångar och alveoler.

Anatomy of the surrounding structures including thoracic cavity, ribs, sternum, diaphragm, pleura space, respiratory muscles

Anatomy of the innervations of the respiratory system:

* Muskulaturen innerveras av parasympaticus och sympatikus.
* Aktivering av parasympaticus med frisättning av acetylkolin ger en sammandragning av luftvägarna.
* Vid sympaticusaktivering frisätts noradrenalin som binds till beta2 receptorer och ger en vidgning av luftvägarna.
* Diafragma aktiveras av frenikusnerven (C3-C5).

Anatomy of the pulmonary circulation (adult\*\* and foetus\*)

Respiration:

Properties of gases including partial pressures:

Mechanism of respiration:

Methods to quantify respiratory phenomena:

Ventilation: static and dynamic spirometry, inspiration and expiration, lung volumes

Compliance, resistance, air flow

Alveolar surface tension including the role of surfactant

Work of breathing, respiratory muscles

Pulmonary circulation:

Pressure, volume, flow

Ventilation/perfusion ratio

Regulation of pulmonary blood flow

Gas exchange:

O2, CO2 diffusion: alveoli-blood, blood-tissues

CO2 binding, transport and distribution in the blood

CO2 in CSF\*

O2 binding, transport and distribution in the blood

Control of breathing:

Neural and chemical regulation

Respiratory adjustments in health and disease:

Exercise\*

Hypoxia

Oxygen treatment\*

Hypercapnia and hypocapnia

Increased barometric pressure\*

Artificial breathing

Non-respiratory functions of the lung:

Metabolic and endocrine function

Lung defense mechanism\*

Detoxification\*

Buffers the blood volume\*