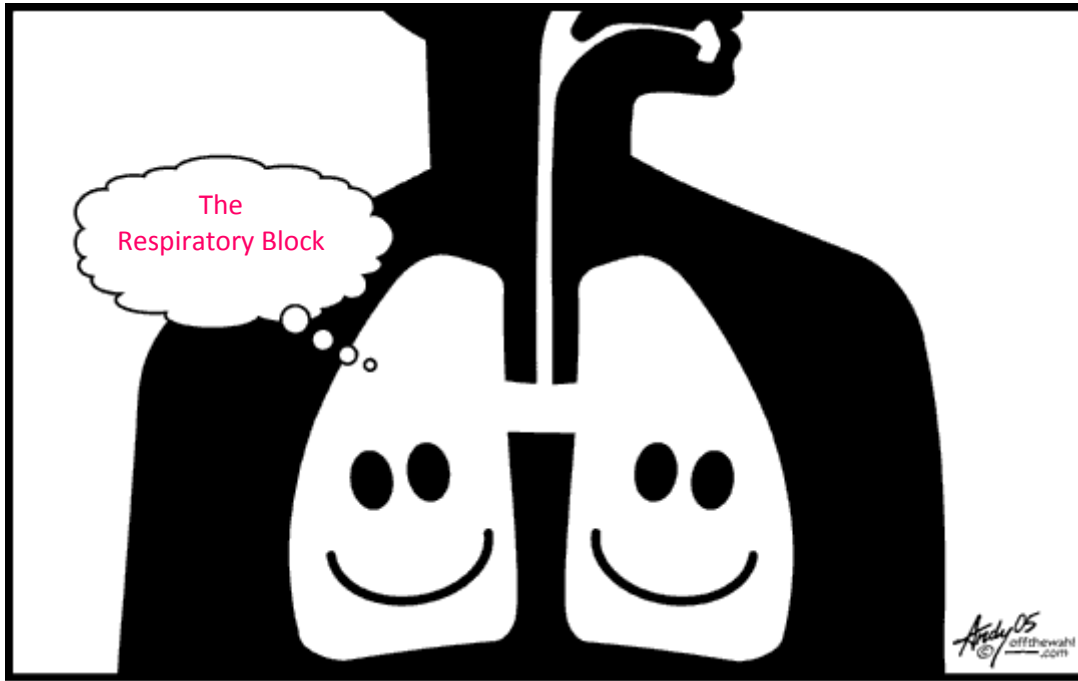


The Physiology Team



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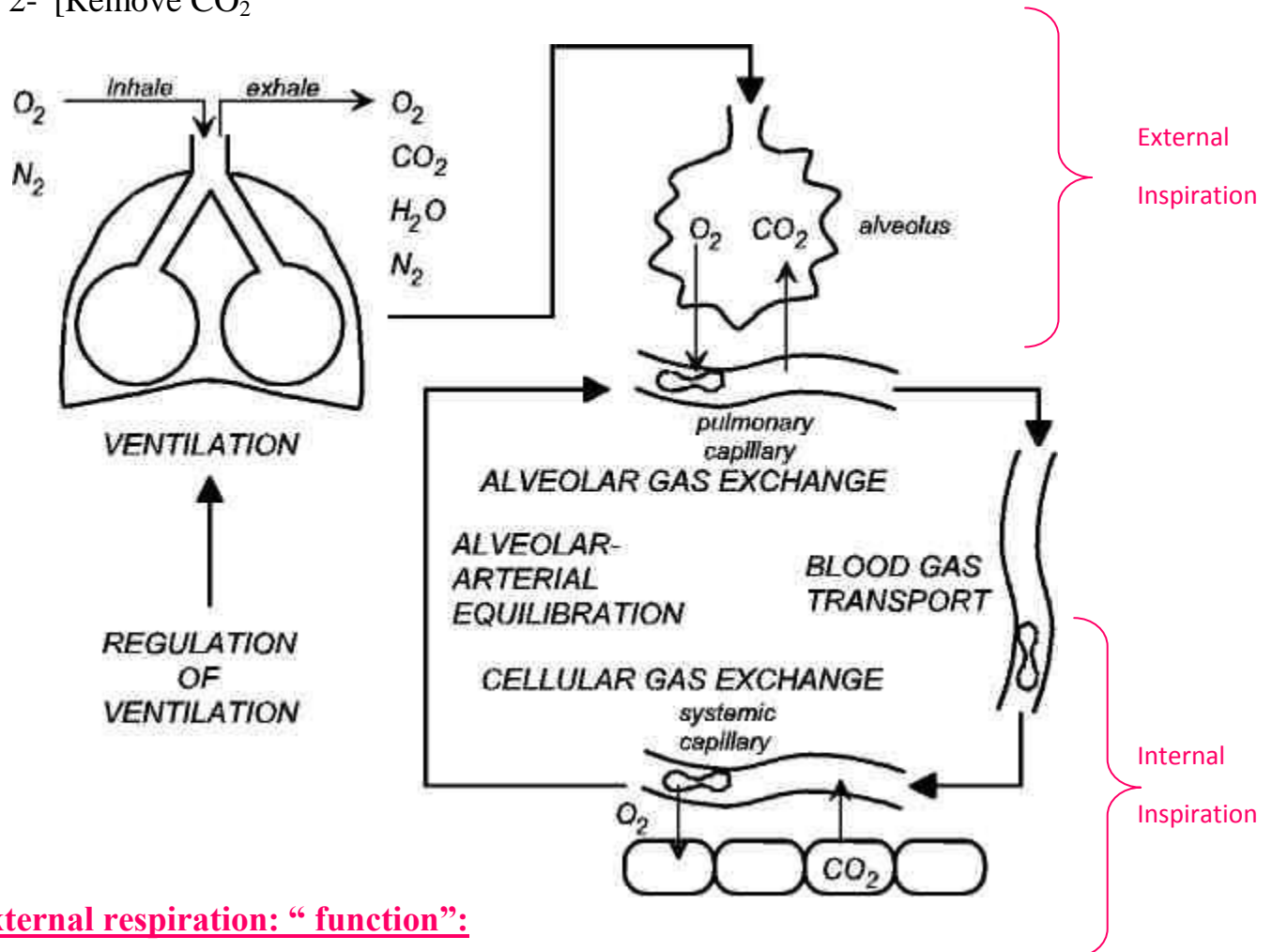
هذه المذكرة للمذاكرة قبل الاختبار وهي تقريبا شاملة لكل شيء في المحاضرة

We did our best and I hope our best is enough

Function and organization of the respiratory system

Goal of respiration

- 1- Provide O_2
- 2- [Remove CO_2



External respiration: "function":

- 1- Ventilation
- 2- Diffusion of O_2 and CO_2 between alveoli and the capillaries
- 3- Transport of the gases to and from the cells

*when we inhale the air it passes through all these structures

Nose → larynx → trachea → Rt and Lt Bronchus → bronchi → bronchioles
→ alveoli “ gas exchange happen “

Respiratory passages (airways)

1- The conductive zone “from nose → bronchioles”

Fun:

* transport air to the respiratory zone, humidification and filtering the inspired air.

*contain the olfactory receptors “ responsible of smelling “

*conduct sound

2- The respiratory zone “gas exchange part “

((acini or primary lobule))

Functions of the respiratory system include

1-Gas exchange (respiratory function),

Non respiratory functions of lung

2-Phonation:is the production of sounds by the movement of air through the vocal cords. ,

3-Pulmonary defense

- IgA

-Alpha-1 antitrypsin ((which lysis the proteins))

Note: when the infection occurs the bacteria release some photolytic

enzymes which contain trypsin that cause destruction to the lung tissue

- the macrophages

4-metabolic role (some of the bioactive material in our body reach the lung to be activated):

*AngiotensinI is converted to angiotensinII with the help of converting enzymes formed by the lungs

5-Humidification;

*this prevents dehydration of the epithelium , regulates body temperature , and regulate water balance.

6-Regulating the acid-base status of the body

*by washing out extra carbon dioxide from the blood.

7-Secretion of important substances like surfactant.

Lining cells of the alveoli:

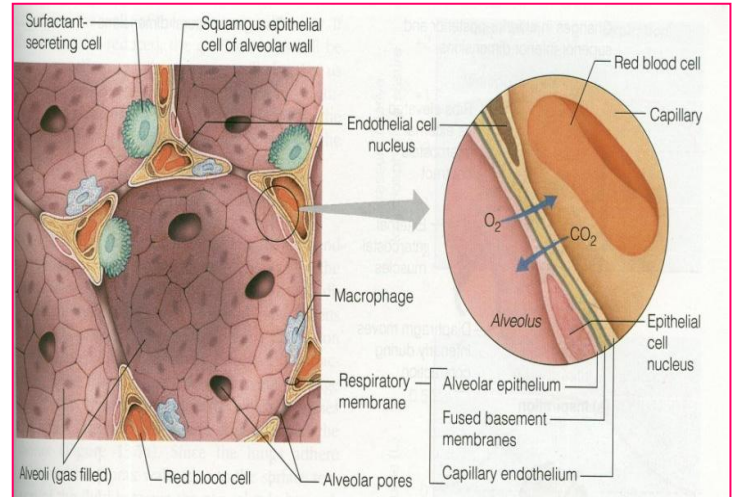
1-Type I alveolar cells (*for gas exchange*)

2-Type II alveolar cells(*secrete surfactant*)

3-Macrophages(*engulf foreign bodies*)

Surfactant:

Surfactant is a complex substance containing phospholipids and a number of apoproteins.



*This essential fluid is produced by the Type II alveolar cells, and lines the alveoli and smallest bronchioles.

*Secreted at wk 35 of intrauterine life from fetal alveoli.

*Surfactant reduces surface tension throughout the lung, thereby contributing to its general compliance

Functions of surfactant:

1-prevents alveolar collapse.

2-reduces the work of breathing, making respiration easier.

3-keeps the alveoli dry. When surface tension force is higher, it sucks fluid into the alveolar spaces from the capillaries.

***Deficiency** in premature babies cause respiratory distress syndrome of the new born (RDS). (hyaline membrane disease)

*Smoking in adult, Hypoxia or hypoxemia decrease the secretion of surfactant and cause adult respiratory distress syndrome.

Innervations of lungs and bronchi :

By autonomic nerves

-Sympathetic → dilatation of the bronchi

-Parasympathetic → constriction of the bronchi.

*Locally secreted factors (histamine, SRSA, by Mast cells, Due to allergy often cause bronchiolar constriction