**Respiration Physiology**

* External Respiration vs. Internal Respiration
* exchange of O2/CO2 btwn. fluids & environment (\_\_\_\_\_\_\_\_\_)) vs. (btwn cells (\_\_\_\_\_\_\_\_ level))
* **Four major Steps of Respiration**

 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (breathing) 🡪 air into & out of lungs

 2. Gas \_\_\_\_\_\_\_\_\_\_ Across Respiratory Membrane 🡪 from \_\_\_\_\_\_\_\_\_\_to alveolar capillaries

 3. Storage and \_\_\_\_\_\_\_\_\_\_\_of O2/ CO2 🡪 from alveolar caps to \_\_\_\_\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The last two will be referred to as Gas pickup & delivery.

* If any of these steps is affected 🡪 \_\_\_\_\_\_\_\_\_\_occurs ( tissues are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)
* If O2 is completely \_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 \_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 air into and out of \_\_\_\_\_\_\_\_\_ (continual supply of O2 prevents build up of CO2)
* \_\_\_\_\_\_\_\_\_\_\_\_ 🡪 inverse relationship btwn volume & pressure of a gas. As one \_\_\_\_\_\_\_\_, the other \_\_\_\_\_\_\_\_
* Inhalation/expiration changes the \_\_\_\_\_\_\_\_\_\_ which changes the \_\_\_\_\_\_\_\_\_\_
* Pressure gradients move air into & out from \_\_\_\_\_\_\_\_\_\_\_\_\_
* Pleural cavity / fluid \_\_\_\_\_\_\_\_\_\_ but creates a \_\_\_\_\_\_\_\_ when you try to separate Ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Surface of each lung sticks to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and top \_\_\_\_\_\_\_\_\_\_\_\_\_
* This fluid bond is actually what keeps \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_!
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes when diaphragm or ribs move
* When diaphragm is relaxed, it curves \_\_\_\_\_\_\_\_\_\_\_in a dome shape, when it contracts, it moves \_\_\_\_\_\_\_ and increases the volume of cavity. Pg. 453 Fig. 16.2
* \_\_\_\_\_\_\_\_\_\_\_= ribs elevate, diaphragm contracts, size of cage \_\_\_\_\_, pressure decreases & air goes into\_\_\_\_\_
* Opposite occurs 🡪 **Exhalation** = rib cage gets \_\_\_\_\_, volume decrease, pressure \_\_\_\_, & air moves out of lungs.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= 1 single inhalation & exhalation
* \_\_\_\_\_\_\_\_\_\_= amt. of air into & out of lungs in a single respiration; avg. \_\_\_\_\_\_\_\_--- but only 350 ml. enters aveoli; the other \_\_\_\_\_\_ keep alveoli inflated.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_= when pleural fluid bond is broken
* **Respiratory Muscles** internal and external intercostals ( ribs) 🡪 \_\_\_\_\_\_\_ of work

 diaphragm 🡪 \_\_\_\_\_\_\_ of work

* \_\_\_\_\_\_\_\_\_\_\_\_🡪 after each breath, contact is broken to permit \_\_\_\_\_\_\_\_\_\_, meets \_\_\_\_\_\_\_\_ demands of cells.
* **CPR** 🡪 cardiopulmonary resusitation
* Pregnant women rely on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b/c diaphragm can’t move a lot
* **Respiration rate** = # of \_\_\_\_\_\_\_\_\_\_\_\_; avg. adult = \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Air in alveoli always contains \_\_\_\_\_\_\_\_\_\_than outside air, ensures that O2 is constantly flowing \_\_\_\_the aveoli.
* \_\_\_\_\_\_\_\_\_\_\_\_\_= amt. of air into/out of lungs during a quiet resp. cycle
* **Expiratory Reserve Vol.** = amt. of air that *\_\_\_\_\_\_\_\_\_\_\_* voluntarily expelled; 1000ml!
* \_\_\_\_\_\_\_\_\_\_\_\_\_= amt. left after maximum exhalation
* **Inspiratory Reserve Vol**. = amt. that can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= ( ER + TV + IR) + RV; 6 L in males; 4.2 L in females
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= used to measure lung volumes
* \_\_\_\_\_\_\_\_\_\_\_\_\_= air whistling thru. constricted airways

**Gas exchange @ Resp. Membrane**

* \_\_\_\_\_\_\_\_\_\_\_\_= gas molecules go from liquid into air easily ex. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_= decrease in pressure causes O2 to come out of soln. & collect in joints; ex scuba divers
* **Diffusion is efficient b/c** 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-3. if the pressure of O2 \_\_\_\_\_\_\_\_\_, the diffusion into the blood \_\_\_\_\_\_ which makes people light headed @ altitudes of \_\_\_\_\_\_\_\_\_\_\_\_\_

* Fig. 16.21 pg. 462🡪 As blood goes from heart to lungs, there is more \_\_\_\_ than O2; picks up O2 & drops off \_\_\_\_
* Goes to heart to get pumped \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Goes to cells where O2 is low and CO2 is high; both are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Gas Pickup and Delivery **O2 transport**
* Hb saturation🡪1 heme can hold \_\_\_\_\_\_\_\_\_\_\_
* normally, heme is \_\_\_\_\_ saturated; only holds 2
* \_\_\_\_\_\_\_\_\_\_\_🡪 CO \_\_\_\_\_\_\_\_\_\_\_\_ with O2 for binding sites; CO usually wins b/c it has \_\_\_\_\_\_\_\_\_\_\_ for Hb; treatments = breathe pure O2 or transfuse RBC’s
* **Hb and pH** 🡪 **THE ! pg. 463**
* when pH drops to \_\_\_\_\_\_\_\_\_ , Hb molecules \_\_\_\_\_\_ and release O2 (lose affinity)
* CO2 combines with the water in the blood to make \_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_ and lowers the pH
* Hb and temp.🡪 as temp. increases, \_\_\_\_\_\_\_\_\_\_\_\_\_\_ , and vice versa;
* ensures that \_\_\_\_\_\_\_\_\_\_\_ generating heat get the O2 they need
* \_\_\_\_\_\_\_\_\_\_\_ has a much higher affinity for O2 than adult Hb; ensures that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 opposite reaction of BOHR SHIFT occurs; as pH increases, heme gains affinity for O2