**Class Activity #9 (Physiology)**

**The Respiratory System**

**Review the Lectures and Worksheet content for the Respiratory System.**

*Read and use your textbook, lecture notes, slides or internet to* ***select*** *best answers. Online labs, Pre-Lab Lung Disorders Assignment will all be useful for review of Study Guide #3 content.*

**Breathing Air and the Respiratory System**

**1.** If breathing in air, the respiratory system starts at the \_\_\_\_\_\_\_\_\_\_\_\_ and immediately enters the \_\_\_\_\_\_\_\_\_\_\_\_ cavity. This is an important site for the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of inspired air, which happens in 3 main ways: **1)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, **2)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and **3)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**2.** The wind pipe is called the \_\_\_\_\_\_\_\_\_\_\_\_\_ and it splits into the L and R \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**3.** The R lung has \_\_\_ lobes and the L lung has \_\_\_ lobes, both located in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**4.** The structure of the lungs that are for gas exchange are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. There are about \_\_\_\_\_\_\_\_\_\_ million of these in each lung. These structures are composed of 3 different types of cells, they are: **1)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, **2)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and **3)** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**5.** When *internal intercostal* muscles contract, this causes a(n)\_\_\_ \_\_\_\_\_ in the \_\_\_\_\_ \_\_\_\_\_\_\_ of the thoracic cavity. This then causes a(n) \_\_\_ \_\_\_\_ in the \_\_ \_\_\_\_\_\_\_ of this cavity.

**6.** During \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the diaphragm contracts and the muscle moves \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This movement changes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the thoracic cavity, making it \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. As a consequence, air moves in which direction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**7.** Name a muscle group normally only used during forced breathing: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The contraction of these muscles causes the \_\_\_\_\_\_\_\_\_\_\_ of the thoracic cavity to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. As a consequence, air moves in which direction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Gas Exchange**

**8.** Gases move from areas of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to areas of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**9.** If an individual gas moves from one region to another, what has to be present? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**10.** If a liquid is exposed to a PCO2 of 100 mmHg and a PO2 of 100 mmHg, then equal amounts of oxygen and carbon dioxide will dissolve in the liquid. True or false? \_\_\_\_\_\_\_\_\_.

Why or why not is this accurate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**11.** The more soluble a gas is, the (greater/less?) the partial pressure needed to force the gas into solution. Gases move between liquid and gaseous phases until \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is reached. Which gas is more soluble in body fluids: O2 or CO2? \_\_\_\_\_\_\_\_\_\_. Descending into a valley, the atmospheric pressure increases to 880 mm Hg. Calculate the partial pressure of O2 in the air, given that N2 and O2 are the only components of air. Answer = \_\_\_\_ \_\_\_\_\_\_\_\_\_.

**12.** The roles of Hb are to transport \_\_O2 and CO2\_\_\_\_. Specifically, Hb is found \_\_\_ \_\_\_\_\_\_\_. When looking at the **Hemoglobin-O2 Saturation Curve**, the affinity that Hb has for O2 can be altered (i.e., the curve can be shifted) by what 4 factors? **1)** \_\_ \_\_\_\_\_\_\_\_\_\_, **2)** \_\_ \_\_\_\_\_\_\_ **3)** \_\_\_ \_\_\_\_ and 4**)** \_\_\_\_ \_\_\_\_\_\_. Use this information to describe the basic pattern of how Hb transports gases.

**13.** The type of cells lining most of the respiratory tract is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is called \_\_\_\_Respiratory epi\_\_\_\_\_\_\_\_\_\_\_. This lining of the respiratory tract changes at specific regions, such as at the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, where it turns into \_\_\_\_\_\_\_\_Simple squamous\_\_\_\_\_\_\_\_\_ for exchange. With regard to the airways, the terminal bronchioles are (larger/smaller?) than the respiratory bronchioles?

**14.** Explain why the intra-pleural pressure must always be both sub-atmospheric and sub-alveolar. If the pleural membrane were punctured, what would happen (use the clinical term) and why?

**15.** What are the perfect conditions for the best exchange between the pulmonary capillaries and the alveoli? Let’s list them out and then identify specific disease states that exhibit problems with these conditions