Class Activity #10 Physiology

Student Presentations, Respiratory Control and the Renal System

1. Suggestions for how to find a good Scientific Article that you like.

a) Think of a topic that interests you and involves physiology.

b) Conduct a general search online, then focus on a more specific topic.

c) Use the Miramar Library "ProQuest Research Library"
https://login.libraryaccess.sdmiramar.edu/login?qurl=http%3a%2f%2fsearch.proquest.com%2f%3faccountid%3d38871%26selectids%3d10000025

d) Target Date for Presentations will soon be announced.

2. Control of Respiration and Intro to the Renal System

Read and use your OER textbook, worksheets, lecture notes, slides or internet to provide best answers.

1) Fill in this **Feedback Loop**: If the pH of *arterial* blood decreases, then this will be detected by a type of receptor that in general is called a _____, because it chemicals. Specifically, they are named for their location. In the aorta they are called _____; in the carotid arteries they are called _____. They send signals the _____ in the CNS. This then signals the effector tissue, principally the primary muscle of inspiration, the _____. It's activity will (increase/decrease) _____, thereby _____ levels of _____ in arterial blood.

2) There are stretch sensitive _____ within the lung tissue that detect changes in lung _____. They are triggered if the lunges become _____. They then send signals specifically to the _____, which is located in the pons. This specific region then acts to _____ another region called the _____ (which is also in the pons), therefore, this works to prevent _____ of the lungs.

3) If the main regulator of ventilation is **CO_2** in the blood/CSF, then why does hyperventilating make people faint? Furthermore, if hyperventilating, why would breathing into a paper bag prevent fainting?

4) Write the **Bicarbonate Buffer Equation:** _____.

5) If there is an increase in CO_2 in CSF (and the P_{CO2} is also high in cerebral capillaries), this will cause a shift to the Bicarbonate Buffer Equation in which direction? _____.

6) If the Eq. above is moving in the ***forward*** direction, then more _____ will be made. This causes a/an _____ in the pH of CSF. Due to the _____ on cerebral capillaries, any excess _____ cannot leave the CSF by moving across the capillaries. Therefore, the concentration of _____ will continue to _____ within the brain. It is when this excess in _____ binds to the central _____ located in the _____ of the brain, this then triggers the response to _____ ventilation. This will then cause a/an _____ in the _____ levels, which will then shift the Eq. in the _____ direction which will then cause a/an _____ in the pH of the CSF.

3. Introduction to the Renal System

1) List and briefly describe the 5 main functions of the renal system (as discussed in lecture).

1)

2)

3)

4)

5)

2) What are the 3 Nitrogenous wastes normally found in Blood? What are they the product of?

1)

2)

3)

3) Angiotensinogen is made by the _____ and is (active/inactive) until it is acted on by the substance _____, which is released by the _____ in order to _____.

Multiple-Choice Questions

1. Which of the following areas of the brain can influence a person's breathing?

1. pons **2.** limbic system **3.** medulla oblongata **4.** cerebellum **5.** thalamus **6.** cerebrum

a) 1 and 3 **b)** 3, 2, 5 and 1 **c)** 4, 3, 2 and 1 **d)** 4 and 5 **e)** 6, 1, 3 and 2

2. If breathing air at 30m under water, the changes in pressure can have which effects on the body?

1. oxygen narcosis **2.** decreased solubility of N_2 **3.** increased reactivity of H_2

4. decreased solubility of CO_2 **5.** increased solubility of O_2 **6.** nitrogen narcosis

a) 1, 6 and 5 **b)** 3, 5 and 6 **c)** 2 and 5 **d)** 6, 2 and 4 **e)** 1, 5, 6 and 2

3. Using the answer code below, indicate which chemoreceptors are being described.

A = peripheral chemoreceptors, **B** = central chemoreceptors, **C** = both chemoreceptors, **D** = neither

1. ____ stimulated by a drop in arterial P_{O2} to 80 mm Hg.

2. ____ stimulated by an elevated $[H^+]$ arterial blood.

3. ____ stimulated by an elevated $[H^+]$ in CSF.

4. In In the entire renal system, there are _____ nephrons.

a) over 1 million **b)** fewer than 2 million **c)** over 2 million **d)** over 3 million **e)** over 4 million

5. The glomerular filtration rate (GFR) in a normal adult person is about

a) 75 ml/min **b)** 180 liters a day **c)** 180 ml/min **d)** 125 liters a day **e)** 125 ml/hour