D-277 Dental Physiology Quiz 4
Wednesday, June 3, 2009

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Name **Student Number**

(0.25 pts. for each correct answer)

QUESTIONS 1-3 ONLY:Use the following table to answer questions 1-3.

VARIABLE	PATIENT'S VALUES	NORMAL VALUES
$FEV_{1\ sec.}$ (% of VC)	53	>75
% Hemoglobin Saturation	89	>97
P_aCO_2 (mmHg)	42	40
P_aO_2 (mmHg)	58	100
Compliance (Liters/cmH_2O)	0.6	0.2

1. Because the compliance of this patient is above normal, you would expect TLC to be:
   a. *Above normal
   b. Below normal
   c. Normal

2. Is this patient hypoxic and hyperventilating ?
   a. Yes, this is supported by the data.
   b. *No, the data indicate that the patient is hypoxic and hypoventilating.
   c. No, the data indicate that the patient is normoxic and hyperventilating.
   d. No, the data indicate that the patient is hypoxic but is neither hyper nor hypoventilating.

3. FEV1 sec. indicates that the patient:
   a. Would experience dynamic compression close to the alveoli (compared to normal) when she tried to forcefully exhale.
   b. May have serious issues with respect to air trapping.
   c. Probably has an obstructive pulmonary pathology.
   d. *All of the above are correct choices.

4. What is the data that indicates that gas transfer of a certain gas is diffusion limited and not perfusion limited ?
   a. That the partial pressure of the gas in the blood being aerated by the alveoli comes into equilibrium with the partial pressure of the gas in the alveoli.
   b. *That the partial pressure of the gas in the blood being aerated by the alveoli remains below the partial pressure of the gas in the alveoli.
   c. That the partial pressure of the gas in the blood being aerated by the alveoli becomes higher than the partial pressure of the gas in the alveoli.
   d. None of the above is correct.

5. Slowly adapting PSR's (pulmonary stretch receptors) prevent the adult lung from over-expanding.
   a. *True.
   b. False.

In the paracellular route for Na^+ reabsorption in the proximal tubule, how do the Na^+ ions move from the tubular fluid to the basolateral spaces?

A. *They diffuse through the tight junctions to the basolateral space as they follow Cl^- ions to maintain electroneutrality
B. They enter the epithelial cells by Na^+/H^+ exchange and are pumped to the basolateral spaces by the Na^+ pumps
C. They enter the epithelial cells by Na^+, glucose co-transport and are pumped to the basolateral spaces by the Na^+ pumps
D. They enter the epithelial cells through Na^+ channels in the apical membrane and are pumped to the basolateral spaces by the Na^+ pumps

The flow rate of the tubular fluid passing from the proximal tubule to the descending limb of the loop of Henle is usually about

A. 80% of the glomerular filtration rate
B. 67% of the glomerular filtration rate
C. *33% of the glomerular filtration rate
D. 20% of the glomerular filtration rate
E. 1% of the glomerular filtration rate

A 25-year-old man has a hematocrit of exactly 50%. He eats several grams of NaCl without drinking any liquids and this causes 1 liter of water to shift from his intracellular fluid to his extracellular fluid. What effect will this have on his **blood** volume?

A. His blood volume will increase because of his increased plasma volume.
B. His blood volume will decrease because of the decreased volume of his blood cells.
C. *His blood volume will not change because the increase in his plasma volume is equal to the decrease in the volume of his blood cells.

If a man's GFR is 120 ml/min, his plasma glucose concentration is 150 mg/dL (1.5 mg/ml), and there is no glucose in his urine, which is a possible value of his glucose reabsorption rate under these conditions?

A. 120 mg/min
B. 150 mg/min
C. *180 mg/min
D. 375 mg/min
E. 900 mg/min