

A&P 26 Fluid, Electrolyte, Acid-Base Balance Essay

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4. Chapter: A&P 26 Fluid, Electrolyte, Acid-Base Balance Essay

1. A&P 26 Fluid, Electrolyte, Acid-Base Balance Essay Questions

4.1.1. Watch this video (<http://openstaxcollege.org/l/bodyfluids>) to learn...

Author: OpenStax College

Watch this video (<http://openstaxcollege.org/l/bodyfluids>) to learn more about body fluids, fluid compartments, and electrolytes.

When blood volume decreases due to sweating, from what source is water taken in by the blood?

- The interstitial fluid (IF).

Check the answer of this question online at QuizOver.com:

Question: [Watch this video http://openstaxcollege.org/l/bodyfluids](http://openstaxcollege.org/l/bodyfluids) OpenStax College Anatomy

4.1.2. Watch this video (<http://openstaxcollege.org/l/dynamicfluid>) to see...

Author: OpenStax College

Watch this video (<http://openstaxcollege.org/l/dynamicfluid>) to see an explanation of the dynamics of fluid in the body's compartments.

What happens in tissues when capillary blood pressure is less than osmotic pressure?

- Fluid enters the capillaries from interstitial spaces.

Check the answer of this question online at QuizOver.com:

Question: [Watch this video http://openstaxcollege.org/l/dynamicfluid](http://openstaxcollege.org/l/dynamicfluid) OpenStax College Anatomy

4.1.3. Watch this video (<http://openstaxcollege.org/l/saltwater>) to see an...

Author: OpenStax College

Watch this video (<http://openstaxcollege.org/l/saltwater>) to see an explanation of the effect of seawater on humans.

What effect does drinking seawater have on the body?

- Drinking seawater dehydrates the body as the body must pass sodium through the kidneys, and water follows.

Check the answer of this question online at QuizOver.com:

Question: [Watch this video http://openstaxcollege](http://openstaxcollege.org/l/saltwater) OpenStax College Anatomy

4.1.4. Watch this video (<http://openstaxcollege.org/l/altitude>) to see a d...

Author: OpenStax College

Watch this video (<http://openstaxcollege.org/l/altitude>) to see a demonstration of the effect altitude has on blood pH.

What effect does high altitude have on blood pH, and why?

- Because oxygen is reduced, the respiratory rate increases to accommodate, and hyperventilation removes CO₂ faster than normal, resulting in alkalosis.

Check the answer of this question online at QuizOver.com:

Question: [Watch this video http://openstaxcollege](http://openstaxcollege.org/l/altitude) OpenStax College Anatomy

4.1.5. Plasma contains more sodium than chloride. How can this be if indiv...

Author: OpenStax College

Plasma contains more sodium than chloride. How can this be if individual ions of sodium and chloride exactly balance each other out, and plasma is electrically neutral?

- There are additional negatively charged molecules in plasma besides chloride. The additional sodium balances the total negative charges.

Check the answer of this question online at QuizOver.com:

Question: [Plasma contains more sodium than chloride OpenStax College Anatomy](#)

4.1.6. How is fluid moved from compartment to compartment?

Author: OpenStax College

How is fluid moved from compartment to compartment?

- Fluid is moved by a combination of osmotic and hydrostatic pressures. The osmotic pressure results from differences in solute concentrations across cell membranes. Hydrostatic pressure results from the pressure of blood as it enters a capillary system, forcing some fluid out of the vessel into the surrounding tissues.

Check the answer of this question online at QuizOver.com:

Question: [How is fluid moved from compartment to OpenStax College Anatomy Quest](#)

4.1.7. Describe the effect of ADH on renal collecting tubules.

Author: OpenStax College

Describe the effect of ADH on renal collecting tubules.

- ADH constricts the arterioles in the peripheral circulation, limiting blood to the extremities and increasing the blood supply to the core of the body.
ADH also causes the epithelial cells lining the renal collecting tubules to move water channel proteins called aquaporins from the sides of the cells to the apical surface.
This greatly increases the passage of water from the renal filtrate through the wall of the collecting tubule as well as the reabsorption of water into the bloodstream.

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Describe the effect of ADH on renal OpenStax College Anatomy Quest](#)

4.1.8. Why is it important for the amount of water intake to equal the amo...

Author: OpenStax College

Why is it important for the amount of water intake to equal the amount of water output?

- Any imbalance of water entering or leaving the body will create an osmotic imbalance that will adversely affect cell and tissue function.

Check the answer of this question online at QuizOver.com:

Question: [Why is it important for the amount of OpenStax College Anatomy Quest](#)

4.1.9. Explain how the CO₂ generated by cells and exhaled in the lungs is ...

Author: OpenStax College

Explain how the CO₂ generated by cells and exhaled in the lungs is carried as bicarbonate in the blood.

- Very little of the carbon dioxide in the blood is carried dissolved in the plasma. It is transformed into carbonic acid and then into bicarbonate in order to mix in plasma for transportation to the lungs, where it reverts back to its gaseous form.

Check the answer of this question online at QuizOver.com:

Question: [Explain how the CO₂ generated by cells OpenStax College Anatomy Quest](#)

4.1.10. How can one have an imbalance in a substance, but not actually have...

Author: OpenStax College

How can one have an imbalance in a substance, but not actually have elevated or deficient levels of that substance in the body?

- Without having an absolute excess or deficiency of a substance, one can have too much or too little of that substance in a given compartment.
Such a relative increase or decrease is due to a redistribution of water or the ion in the body's compartments.
This may be due to the loss of water in the blood, leading to a hemoconcentration or dilution of the ion in tissues due to edema.

Check the answer of this question online at QuizOver.com:

Question: [How can one have an imbalance in a substance OpenStax College Anatomy](#)

4.1.11. Describe the conservation of bicarbonate ions in the renal system.

Author: OpenStax College

Describe the conservation of bicarbonate ions in the renal system.

- Bicarbonate ions are freely filtered through the glomerulus. They cannot pass freely into the renal tubular cells and must be converted into CO₂ in the filtrate, which can pass through the cell membrane. Sodium ions are reabsorbed at the membrane, and hydrogen ions are expelled into the filtrate. The hydrogen ions combine with bicarbonate, forming carbonic acid, which dissociates into CO₂ gas and water. The gas diffuses into the renal cells where carbonic anhydrase catalyzes its conversion back into a bicarbonate ion, which enters the blood.

Check the answer of this question online at QuizOver.com:

Question: [Describe the conservation of bicarbonate OpenStax College Anatomy](#)

4.1.12. Describe the control of blood carbonic acid levels through the resp...

Author: OpenStax College

Describe the control of blood carbonic acid levels through the respiratory system.

- Carbonic acid blood levels are controlled through the respiratory system by the expulsion of CO₂ from the lungs.
The formula for the production of bicarbonate ions is reversible if the concentration of CO₂ decreases. As this happens in the lungs, carbonic acid is converted into a gas, and the concentration of the acid decreases.
The rate of respiration determines the amount of CO₂ exhaled. If the rate increases, less acid is in the blood; if the rate decreases, the blood can become more acidic.

Check the answer of this question online at QuizOver.com:

Question: [Describe the control of blood carbonic OpenStax College Anatomy Quest](#)

4.1.13. Case Study: Bob is a 64-year-old male admitted to the emergency roo...

Author: OpenStax College

Case Study: Bob is a 64-year-old male admitted to the emergency room for asthma.

His laboratory results are as follows: pH 7.31, pCO₂ higher than normal, and total HCO₃⁻ also higher than normal.

Classify his acid-base balance as acidosis or alkalosis, and as metabolic or respiratory.

Is there evidence of compensation? Propose the mechanism by which asthma contributed to the lab results seen.

- Respiratory acidosis is present as evidenced by the decreased pH and increased pCO₂, with some compensation as shown by the increased total HCO₃⁻.
His asthma has compromised his respiratory functions, and excess CO₂ is being retained in his blood.

Check the answer of this question online at QuizOver.com:

Question: [Case Study: Bob is a 64-year-old male OpenStax College Anatomy Quest](#)

4.1.14. Case Study: Kim is a 38-year-old women admitted to the hospital for...

Author: OpenStax College

Case Study: Kim is a 38-year-old women admitted to the hospital for bulimia.

Her laboratory results are as follows: pH 7.48, pCO₂ in the normal range, and total HCO₃⁻ higher than normal.

Classify her acid-base balance as acidosis or alkalosis, and as metabolic or respiratory.

Is there evidence of compensation? Propose the mechanism by which bulimia contributed to the lab results seen.

- Metabolic alkalosis is present as evidenced by the increased pH and increased HCO₃⁻, without compensation as seen in the normal pCO₂.
The bulimia has caused excessive loss of hydrochloric acid from the stomach and a loss of hydrogen ions from the body, resulting in an excess of bicarbonate ions in the blood.

Check the answer of this question online at [QuizOver.com](http://www.quizover.com):

Question: [Case Study: Kim is a 38-year-old women OpenStax College Anatomy Quest](#)