

ATI Med Surg test questions Fluid and Electrolytes Balance and Disturbance 100% Correct Answers Newest Version 2024

Chapter 10: Fluid and Electrolytes

Hinkle: Brunner & Suddarth's Textbook of Medical-Surgical Nursing, 15th Edition

MULTIPLE CHOICE

1. The nurse is caring for a client who has a diagnosis of syndrome of inappropriate antidiuretic hormone secretion. The plan of care includes assessment of specific gravity every four hours. The results of this test will allow the nurse to assess which aspect of the client's health?
 1. Nutritional status
 2. Potassium balance
 3. Calcium balance
 4. Fluid volume status

ANS: D Rationale: Specific gravity measures the density of urine compared with water and can assess the ability of the kidneys to excrete or conserve water. Therefore, specific gravity will detect if the client has a fluid volume deficit or fluid volume excess. Nutrition, potassium, and calcium levels are not directly indicated. REF:p.230

2. The nurse is caring for a client admitted with a diagnosis of acute kidney injury. When reviewing the client's most recent laboratory reports, the nurse notes that the client's magnesium levels are high. The nurse should prioritize assessment for what health problem?
 1. Diminished deep tendon reflexes
 2. Tachycardia
 3. Cool, clammy skin
 4. Acute flank pain

ANS: A Rationale: To gauge a client's magnesium status, the nurse should check deep tendon reflexes. If the reflex is absent, this may indicate high serum magnesium. Tachycardia, flank pain, and cool, clammy skin are not typically associated with hypermagnesemia. REF:p.254

3. The nurse is working on a burn unit and an acutely ill client is exhibiting signs and symptoms of third spacing. Based on this change in status, the nurse should expect the client to exhibit signs and symptoms of which imbalance?
 1. Metabolic alkalosis
 2. Hypermagnesemia
 3. Hypercalcemia
 4. Hypovolemia

ANS: D Rationale: Third-spacing fluid shift, which occurs when fluid moves out of the intravascular space but not into the intracellular space, can cause hypovolemia. Increased calcium and magnesium levels are not indicators of third-spacing fluid shift. Burns typically cause acidosis, not alkalosis. REF:p.226

4. A client with a longstanding diagnosis of generalized anxiety disorder presents to the emergency room. The triage nurse notes upon assessment that the client is hyperventilating. The triage nurse is aware that hyperventilation is the most common cause of which acid-base imbalance?
 1. Respiratory acidosis

2. Respiratory alkalosis
3. Increased PaCO₂
4. Metabolic acidosis

ANS: B Rationale: Extreme anxiety can lead to hyperventilation, the most common cause of acute respiratory alkalosis. During hyperventilation, CO₂ is lost through the lungs, creating an alkalotic state and a low PaCO₂. Acute respiratory acidosis occurs in emergency situations, such as pulmonary edema, and is exhibited by hypoventilation and decreased PaCO₂. Metabolic acidosis results from the loss of bicarbonate, not CO₂. REF:p.255

5. The emergency-room nurse is caring for a trauma client who has the following arterial blood gas results: pH 7.26, PaCO₂ 28, HCO₃ 11 mEq/L. How should the nurse interpret these results?
 1. Respiratory acidosis with no compensation
 2. Metabolic alkalosis with compensatory alkalosis
 3. Metabolic acidosis with no compensation
 4. Metabolic acidosis with compensatory respiratory alkalosis

ANS: D Rationale: A low pH indicates acidosis (normal pH is 7.35 to 7.45). The PaCO₂ is also low, which causes alkalosis. The bicarbonate is low, which causes acidosis. The pH bicarbonate more closely corresponds with a decrease in pH, making the metabolic component the primary problem. REF: p.261

While assessing a client's peripheral IV site, the nurse observes edema and coolness around the insertion site. How should the nurse document this observation?

5. Air embolism
6. Phlebitis
7. Infiltration D. Fluid overload

ANS: C Rationale: Infiltration is the administration of non-vesicant solution or medication into the surrounding tissue when the IV cannula dislodges or perforates the wall of the vein. Infiltration is characterized by edema around the insertion site, leakage of IV fluid from the insertion site, discomfort and coolness, and a significant decrease in the flow rate. An air embolism occurs when air enters the vein; it does not have any local manifestations at the IV site but may produce palpitations, dyspnea, hypotension, and chest pain. Phlebitis, an inflammation of the vein, is characterized by redness, warmth, and tenderness at the IV site. Fluid volume overload produces systemic manifestations and is not apparent at the IV site. REF:p.268

The nurse is performing an admission assessment on a 79-year-old client newly admitted for end-stage liver disease. What principle should guide the nurse's assessment of the client's skin turgor?

1. Overhydration is common among healthy older adults.
2. Dehydration causes the skin to appear spongy.
3. Inelastic skin turgor is a normal part of aging.
4. Skin turgor cannot be assessed in clients over the age of 70.

ANS: C Rationale: Inelastic skin is a normal change of aging. However, this does not mean that skin turgor cannot be assessed in older clients. Dehydration, not overhydration, causes inelastic skin with tenting. Overhydration, not dehydration, causes the skin to appear edematous and spongy. REF:p.236

8. A nurse in the neurologic ICU has received a prescription to infuse a hypertonic solution into a client with increased intracranial pressure. This solution will increase the number of dissolved particles in the client's blood, creating pressure for fluids in the tissues to shift into the capillaries and increase the blood volume. This process is best described with which of the following terms?
1. Hydrostatic pressure
 2. Osmosis and osmolality
 3. Diffusion
 4. Active transport

ANS: B Rationale: Osmosis is the movement of fluid from a region of low solute concentration to a region of high solute concentration across a semipermeable membrane. Hydrostatic pressure refers to changes in water or volume related to water pressure. Diffusion is the movement of solutes from an area of greater concentration to lesser concentration; the solutes in an intact vascular system are unable to move so diffusion normally should not be taking place. Active transport is the movement of molecules against the concentration gradient and requires adenosine triphosphate (ATP) as an energy source; this process typically takes place at the cellular level and is not involved in vascular volume changes. REF:p.226

The surgical nurse is caring for a client who is postoperative day 1 following a thyroidectomy. The client reports tingling in the lips and fingers. The client also reports an intermittent spasm in the wrist and hand and exhibits increased muscle tone. Which electrolyte imbalance should the nurse first suspect?

- A. Hypophosphatemia B. Hypocalcemia
C. Hypermagnesemia D. Hyperkalemia

ANS: B Rationale: Tetany is the most characteristic manifestation of hypocalcemia and hypomagnesemia. Sensations of tingling may occur in the tips of the fingers, around the mouth, and, less commonly, in the feet. Hypophosphatemia creates central nervous dysfunction, resulting in seizures and coma. Hypermagnesemia creates hypoactive reflexes and somnolence. Signs of hyperkalemia include paresthesias and anxiety. REF:p.248

9. A nurse, who is orienting a newly licensed nurse, is planning care for a nephrology client. The nurse states, "A client with kidney disease partially loses the ability to regulate changes in pH." What is the cause of this partial inability?
1. The kidneys regulate and reabsorb carbonic acid to change and maintain pH.
 2. The kidneys buffer acids through electrolyte changes.
 3. The kidneys reabsorb and regenerate bicarbonate to maintain a stable pH.
 4. The kidneys combine carbonic acid and bicarbonate to maintain a stable pH.

ANS: C Rationale: The kidneys regulate the bicarbonate level in the extracellular fluid; they can regenerate bicarbonate ions as well as reabsorb them from the renal tubular cells. In respiratory acidosis and most cases of metabolic acidosis, the kidneys excrete hydrogen ions and conserve bicarbonate ions to help restore balance. The lungs regulate and reabsorb carbonic acid to change and maintain pH. The kidneys do not buffer acids through electrolyte changes; buffering occurs in reaction to changes in pH. Carbonic acid works as the chemical medium to exchange O₂ and CO₂ in the lungs to maintain a stable pH, whereas the kidneys use bicarbonate as the chemical medium to maintain a stable pH by moving and eliminating H⁺. REF: p.259

The nurse is caring for a client admitted to the medical unit 72 hours ago with pyloric stenosis. A nasogastric tube was placed upon admission, and since that time the client has been on low intermittent suction. Upon review of the morning's blood work, the nurse notices that the client's potassium is below reference range. The nurse should assess for signs and symptoms of what imbalance?

1. Hypercalcemia
2. Metabolic acidosis
3. Metabolic alkalosis
4. Respiratory acidosis

ANS: C Rationale: Probably the most common cause of metabolic alkalosis is vomiting or gastric suction with loss of hydrogen and chloride ions. The disorder also occurs in pyloric stenosis in which only gastric fluid is lost. Vomiting, gastric suction, and pyloric stenosis all remove potassium and can cause hypokalemia. This client would not be at risk for hypercalcemia; hyperparathyroidism and cancer account for almost all cases of hypercalcemia. The nasogastric tube is removing stomach acid and will likely raise pH. Respiratory acidosis is unlikely since no change was reported in the client's respiratory status. REF:p.261

12. The nurse is caring for a client who has a peripheral IV in place for fluid replacement. When caring for the client's IV site, the nurse should:
1. ensure that anticoagulants are placed on hold for the duration of IV therapy.
 2. replace the IV dressing with a new, clean dressing if it is soiled.
 3. ensure that the tubing is firmly anchored to the client's skin.
 4. periodically remove hair from 2 cm around the IV site.

ANS: C Rationale: Anchoring the IV tubing prevents it from being accidentally dislodged. Anticoagulants are not contraindicated during IV therapy. Soiled dressings should be replaced with a new sterile dressing, not a clean dressing. Hair removal is unnecessary. REF: p.267

13. A client who is being treated for pneumonia reports sudden shortness of breath. An arterial blood gas (ABG) is drawn. The ABG has the following values: pH 7.21, PaCO₂ 64 mm Hg, HCO₃ 24 mm Hg. Which condition does the ABG reflect?
1. Respiratory acidosis
 2. Metabolic alkalosis
 3. Respiratory alkalosis
 4. Metabolic acidosis

ANS: A Rationale: The pH is below 7.35, PaCO₂ is greater than 40, and the HCO₃ is normal; therefore, it is a respiratory acidosis, and compensation by the kidneys has not begun, which indicates this was probably an acute event. The HCO₃ of 24 is within the normal range, so it is not metabolic alkalosis. The pH of 7.21 indicates an acidosis, not alkalosis. The pH of 7.21 indicates it is an acidosis, but the HCO₃ of 24 is within the normal range, ruling out metabolic acidosis. REF:p.262

14. One day after a client is admitted to the medical unit, the nurse determines that the client is oliguric. The nurse notifies the acute-care nurse practitioner who prescribes a fluid challenge of 200 mL of normal saline solution over 15 minutes. This intervention will help to achieve what goal?

1. Distinguish hyponatremia from hypernatremia.
2. Evaluate pituitary gland function.
3. Distinguish reduced renal blood flow from decreased renal function.
4. Provide an effective treatment for hypertension-induced oliguria.

ANS: C Rationale: If a client is not excreting enough urine, the health care provider needs to determine whether the depressed renal function is the result of reduced renal blood flow, which is a fluid volume deficit (FVD or prerenal azotemia), or acute tubular necrosis that results in necrosis or cellular death from prolonged FVD. A typical example of a fluid challenge involves administering 100 to 200 mL of normal saline solution over 15 minutes. The response by a client with FVD but with normal renal function is increased urine output and an increase in blood pressure. Laboratory examinations are needed to distinguish hyponatremia from hypernatremia. A fluid challenge is not used to evaluate pituitary gland function. A fluid challenge may provide information regarding hypertension-induced oliguria, but it is not an effective treatment.
REF:p.236

15. The community health nurse is performing a home visit to an 80-year-old client recovering from hip surgery. The nurse notes that the client seems uncharacteristically confused at times and has dry mucous membranes. When asked about fluid intake, the client states, "I stop drinking water early in the day because it is just too difficult to get up during the night to go to the bathroom." What would be the nurse's best response?

1. "I will need to have your medications adjusted, so you will need to be readmitted to the hospital for a complete workup."
2. "Limiting your fluids can create imbalances that can result in confusion, so let's try adjusting the timing of your fluids."
3. "It is normal to be a little confused following surgery, and it is safe not to urinate at night."
4. "Confusion and bladder issues are a normal consequence of aging, so I am not too concerned."

16. ANS: B Rationale: In older adult clients, the clinical manifestations of fluid and electrolyte disturbances may be subtle or atypical. For example, fluid deficit may cause confusion or cognitive impairment in the older adult. There is no specific evidence given for the need for readmission to the hospital. Confusion is never normal, common, or expected in older adults.
REF:p.234

16. A client comes into the emergency department (ED) by ambulance with a hip fracture after slipping and falling while at home. The client is alert and oriented but anxious and reports thirst. The client's pupils are equal and reactive to light and accommodation, and the heart rate is elevated. An indwelling urinary catheter is inserted, and 40 mL of urine is present. What is the nurse's most likely explanation for the client's urinary output?

1. The client urinated prior to arrival to the ED and will probably not need to have the urinary catheter kept in place.
2. The client likely has a traumatic brain injury, lacks antidiuretic hormone, and needs vasopressin.
3. The client is experiencing symptoms of heart failure and is releasing atrial natriuretic peptide, which results in decreased urine output.
4. The client is having a sympathetic reaction, which has stimulated the renin-angiotensin-aldosterone system, which results in diminished urine output.

ANS: D Rationale: In response to the acute stress of falling at home, the sympathetic nervous system is activated. Renin is released by the juxtaglomerular cells of the kidneys in response to decreased renal perfusion. Angiotensin-converting enzyme converts angiotensin I to angiotensin II. Angiotensin II, with its vasoconstrictor properties, increases arterial perfusion pressure and stimulates thirst. As the sympathetic nervous system is stimulated, aldosterone is released in response to an increased release of renin, which decreases urine production. Based on the nursing assessment and mechanism of injury, this is most likely causing the lower urine output. The client urinating prior to arrival to the ED is unlikely; the fall and hip injury would make the ability to urinate difficult. No assessment information indicates the client has a head injury or heart failure. REF:p.232

17. A client with hypertension has been prescribed hydrochlorothiazide. What nursing action will best reduce the client's risk for electrolyte disturbances?
1. Maintain a low-sodium diet.
 2. Encourage the use of over-the-counter calcium supplements.
 3. Ensure the client has sufficient potassium intake.
 4. Encourage fluid intake.

ANS: C Rationale: Thiazide diuretics, such as hydrochlorothiazide, cause potassium loss, and it is important to maintain adequate intake during therapy. Hyponatremia is more of a risk than hypernatremia, so a low-sodium diet does not address the risk for electrolyte disturbances. There is no direct need for extra calcium intake, and increased fluid intake does not reduce the client's risk for electrolyte disturbances. REF:p.253

18. The nurse is evaluating a newly admitted client's laboratory results, which include several values that are outside of reference ranges. Which of the following alterations would cause the release of antidiuretic hormone (ADH)?
1. Increased serum sodium
 2. Decreased serum potassium
 3. Decreased hemoglobin
 4. Increased platelets

ANS: A Rationale: Increased serum sodium causes increased osmotic pressure, increased thirst, and the release of ADH by the posterior pituitary gland. When serum osmolality decreases and thirst and ADH secretions are suppressed, the kidney excretes more water to restore normal osmolality. Levels of potassium, hemoglobin, and platelets do not directly affect ADH release. REF:p.232

19. The nurse is providing care for a client with chronic obstructive pulmonary disease. When describing the process of respiration, the nurse explains to a newly licensed nurse how oxygen and carbon dioxide are exchanged between the pulmonary capillaries and the alveoli. The nurse is describing which process?
1. Diffusion
 2. Osmosis
 3. Active transport
 4. Filtration

ANS: A Rationale: Diffusion is the natural tendency of a substance to move from an area of higher concentration to one of lower concentration. It occurs through the random movement of ions and molecules. Examples of diffusion are the exchange of oxygen and carbon dioxide between the pulmonary capillaries and alveoli and the tendency of sodium to move from the extracellular fluid compartment, where the sodium concentration is high, to the intracellular fluid, where its concentration is low. Osmosis occurs when two different solutions are separated by a membrane that is impermeable to the dissolved substances; fluid shifts through the membrane from the region of low solute concentration to the region of high solute concentration until the solutions are of equal concentration. Active transport implies that energy must be expended for the movement to occur against a concentration gradient. Movement of water and solutes occurring from an area of high hydrostatic pressure to an area of low hydrostatic pressure is filtration. REF:p.228

20. When planning the care of a client with a fluid imbalance, the nurse understands that in the human body, water and electrolytes move from the arterial capillary bed to the interstitial fluid. What causes this to occur?

1. Active transport of hydrogen ions across the capillary walls
2. Pressure of the blood in the renal capillaries
3. Action of the dissolved particles contained in a unit of blood
4. Hydrostatic pressure resulting from the pumping action of the heart

ANS: D Rationale: Hydrostatic pressure is the pressure created by the weight of fluid against the wall that contains it. In the body, hydrostatic pressure in blood vessels results from the weight of fluid itself and the force resulting from cardiac contraction. This pressure causes water and electrolytes from the arterial capillary bed to pass into the interstitial fluid, in this instance, as a result of the pumping action of the heart; this process is known as filtration. Active transport does not move water and electrolytes from the arterial capillary bed to the interstitial fluid, filtration does. The number of dissolved particles in a unit of blood is concerned with osmolality. The pressure in the renal capillaries causes renal filtration. REF:p.228

21. Baroreceptors in the left atrium and in the carotid and aortic arches respond to changes in the circulating blood volume and regulate sympathetic and parasympathetic neural activity as well as endocrine activities. Sympathetic stimulation constricts renal arterioles, causing what effect?
1. Decrease in the release of aldosterone
 2. Increase of filtration in the Loop of Henle
 3. Decrease in the reabsorption of sodium
 4. Decrease in glomerular filtration

ANS: D Rationale: Sympathetic stimulation constricts renal arterioles; this decreases glomerular filtration, increases the release of aldosterone, and increases sodium and water reabsorption. None of the other listed options occurs with increased sympathetic stimulation. REF:p.232

22. The nurse is caring for a client who has been involved in a motor vehicle accident. The client's labs indicate a minimally elevated serum creatinine level. The nurse should further assess which body system for signs of injury?

A. Renal

- B. Cardiac
- C. Pulmonary
- D. Nervous

ANS: A Rationale: Serum creatinine is a sensitive measure of renal function. It is not an indicator of cardiac, pulmonary, or nervous system impairments. REF:p.233

23. The nurse is caring for a client who is to receive IV daunorubicin, a chemotherapeutic agent. The nurse starts the infusion and checks the insertion site as per protocol. During the most recent check, the nurse observes that the IV has infiltrated so the nurse stops the infusion. What is the nurse's priority concern with this infiltration?
1. Extravasation of the medication
 2. Discomfort to the client
 3. Blanching at the site
 4. Hypersensitivity reaction to the medication

ANS: A Rationale: Irritating medications, such as chemotherapeutic agents, can cause pain, burning, and redness at the site. Blistering, inflammation, and necrosis of tissues can occur. The extent of tissue damage is determined by the medication concentration, the quantity that extravasated, infusion site location, the tissue response, and the extravasation duration. Extravasation is the priority over the other listed consequences. REF:p.268

24. The nurse caring for a client post colon resection is assessing the client on the second postoperative day. The nasogastric tube remains patent and is draining moderate amounts of greenish fluid. Which assessment finding would suggest that the client's potassium level is too low?
1. Diarrhea
 2. Paresthesias
 3. Increased muscle tone
 4. Joint pain

ANS: B

Rationale: Manifestations of hypokalemia include fatigue, anorexia, nausea, vomiting, muscle weakness, leg cramps, decreased bowel motility, paresthesias (numbness and tingling), and arrhythmias. The client would not have diarrhea because increased bowel motility is inconsistent with hypokalemia. Joint pain is not a symptom of hypokalemia, nor is increased muscle tone. REF:p.245

25. The nurse is caring for a client who is being treated on the oncology unit with a diagnosis of lung cancer with bone metastases. The client reports a new onset of weakness with abdominal pain, and further assessment suggests that the client likely has a fluid volume deficit. The nurse should recognize that this client may be experiencing which electrolyte imbalance?

A. Hyponatremia

B. Hypomagnesemia C. Hypophosphatemia D. Hypercalcemia

ANS: D Rationale: The most common causes of hypercalcemia are malignancies and hyperparathyroidism. Anorexia, nausea, vomiting, and constipation are common symptoms of