

CHAPTER 27. FLUID & ELECTROLYTES, SELF-ASSESSMENT QUESTIONS

1. Which of the following may cause an osmolar gap?
 - A. Ethanol
 - B. Lorazepam
 - C. Mannitol
 - D. A and B only
 - E. All of the above are correct

2. LM is a 67-year-old man admitted with esophageal cancer. Patient parameters are height 185 cm (6'1") and weight 84 kg (185 lb). Determine the patient's fluid requirements.
 - A. 1680 mL/day
 - B. 2780 mL/day
 - C. 2840 mL/day
 - D. 2980 mL/day
 - E. 3180 mL/day

3. A 48-year-old man was admitted to the intensive care unit after sustaining head trauma. His sodium concentration increased from 142 mEq/L (142 mmol/L) on admission to 162 mEq/L (162 mmol/L) 2 days after admission. His weight at admission was 71 kg (156 lb). Which of the following amounts most closely approximates the free water deficit in this patient?
 - A. 2 L
 - B. 4 L
 - C. 7 L
 - D. 10 L
 - E. 12 L

4. A 67-year-old woman (80 kg) with a history of congestive heart failure presents to the clinic with a potassium of 3.1 mEq/L (3.1 mmol/L). Her medications include digoxin 0.125 mg daily, amlodipine 10 mg daily, furosemide 40 mg daily, lisinopril 20 mg daily, and aspirin 81 mg daily. What strategy would you recommend with regard to potassium in this patient?

- A. Begin potassium liquid 20 mEq/mL (20 mmol/mL) as 30 mL orally three times daily
- B. Begin potassium chloride tablets 8 mEq (8 mmol) orally daily
- C. Begin potassium chloride tablets 20 mEq (20 mmol) orally daily
- D. Admit to the hospital and give IV potassium chloride 40 mEq/L (40 mmol/L) over 1 hour
- E. No action is necessary

5. A 76-year-old intubated man (90 kg) has been receiving fluid resuscitation with normal saline. His morning labs are sodium 142 mEq/L (142 mmol/L), potassium 4.1 mEq/L (4.1 mmol/L), chloride 119 mEq/L (119 mmol/L), bicarbonate 17 mEq/L (17 mmol/L), BUN 50 mg/dL (17.9 mmol/L), and creatinine 3.2 mg/dL (283 μ mol/L). Blood gases are pH of 7.34 (7.35–7.45), CO₂ 33 mm Hg (4.4 kPa; 35–45 mm Hg or 4.7–6.0 kPa), and HCO₃ 17 mEq/L or mmol/L (22–26 mEq/L or mmol/L). After 3 L, his BP is 148/66 and heart rate is 69. Urine output has improved significantly over the last shift. The treatment plan is for more fluids. What changes would you recommend regarding fluid replacement in this patient?

- A. Change normal saline to albumin
 - B. Change normal saline to hypertonic saline (NaCl 3%)
 - C. Change normal saline to D₅W
 - D. Change normal saline to lactated ringer's
 - E. Maintain current use of normal saline
6. Which of the following best describe the use of hydroxyethyl starch (HES) solutions??
- A. Less expensive than crystalloids
 - B. Relatively safe in renal dysfunction
 - C. Considered routine maintenance fluid
 - D. Increased risk of death in clinical trials compared to crystalloids
 - E. Demonstrates oxygen carrying capacity
7. The majority of body fluids can be found in which compartment?
- A. Intracellular
 - B. Extracellular
 - C. Transcellular

D. Interstitium

E. Intravascular

8. A 44-year-old woman is admitted with a working diagnosis of sepsis. Her blood pressure is 95/55 and her serum sodium is 156 mEq/L (156 mmol/L). Which of the following would be the best initial strategy for fluid resuscitation?

A. Albumin

B. 0.9% sodium chloride

C. 3% normal saline

D. 5% dextrose in water

E. Hetastarch

9. A 25-year-old woman has been hospitalized secondary to a suspected seizure. She has a calcium of 6.5 mg/dL (1.63 mmol/L) and albumin of 2.0 g/dL (20 g/L). The corrected calcium is calculated to be:

A. 7.3 mg/dL (1.83 mmol/L)

B. 8.1 mg/dL (2.03 mmol/L)

C. 8.8 mg/dL (2.20 mmol/L)

D. 9.7 mg/dL (2.43 mmol/L)

E. None of the above are correct

10. Which of the following medications is most likely to cause hyponatremia?

A. Olanzapine (Zyprexa)

B. Piperacillin/tazobactam (Zosyn)

C. Gentamicin

D. Clonidine (Catapres)

E. Nebivolol (Bystolic)

11. The long-term use of pantoprazole (Protonix) may be associated with:

A. Hypomagnesemia

B. Hypokalemia

C. Hypocalcemia

- D. A + B only
- E. All of the above are correct

12. The appropriate use of hypertonic saline (3%) would include:

- A. Symptomatic hyponatremia
- B. Traumatic brain injury
- C. Use as routine maintenance fluid
- D. A and B only
- E. All of the above are correct

13. A 27-year-old woman was admitted with a 3-month history of shortness of breath and polyuria. Physical examination revealed a lethargic female with a blood pressure of 111/72 mm Hg and heart rate of 110 beats/min. Extremities were without edema.

Her laboratory test results reveal sodium 131 mEq/L (131 mmol/L), potassium 4.5 mEq/L (4.5 mmol/L), chloride 95 mEq/L (95 mmol/L), bicarbonate 15 mEq/L (15 mmol/L), albumin 3.5 g/dl (35 g/L), glucose 726 mg/dL (40.3 mmol/L), pH 7.32, PaCO₂ 28 mm Hg (3.7 kPa), HCO₃ 14 mEq/L (14 mmol/L). Calculate the anion gap in this patient?

- A. 8
- B. 16
- C. 21
- D. 36
- E. None of the above

14. What is the best medication to be given when treating chronic hyponatremia in a patient with cirrhosis?

- A. Hypertonic saline solution
- B. Demeclocycline
- C. Tolvaptan (Samsca)
- D. Conivaptan (Vaprisol)
- E. Urea

15. Which of the following is a treatment for hyperphosphatemia?

- A. Sodium polystyrene sulfonate (Kayexalate)
- B. Zoledronic acid (Zometa)
- C. Furosemide (Lasix)
- D. Lanthanum carbonate (Fosrenol)
- E. Vitamin D

ANSWERS

1. E

2. B

3. C

4. C

5. D

6. D

7. A

8. B

9. B

10. A

11. E

12. D

13. C

14. C

15. D