LEARNING OBJECTIVES

On completion of the chapter, the reader will be able to:

1. Describe the body’s sodium and water-related homeostatic mechanisms, and explain why they are important for normal body function.
2. Estimate plasma osmolality based on serum sodium, glucose, and blood urea nitrogen (BUN) concentrations.
3. Describe the role of arginine vasopressin (AVP) in maintaining plasma osmolality and the effect of nonosmotic release of AVP on water excretion and serum sodium concentration.
4. Characterize the clinical presentation of a patient with hyponatremia based on the severity of the hyponatremia and the rapidity with which it developed.
5. Identify the likely causes of hyponatremia when the plasma is isotonic, hypertonic, and hypotonic.
6. Describe the appropriate treatment of both asymptomatic and symptomatic hyponatremia associated with hypovolemia, euvolemia, and hypervolemia.
7. Devise an appropriate sodium chloride infusion regimen for a patient with acute symptomatic hyponatremia.
8. State the most likely causes of hypernatremia when it is associated with hypovolemia, isovolemia, and hypervolemia.
9. Characterize the clinical presentation of a patient with hypernatremia based on the severity of the hypernatremia and the rapidity with which it developed.
10. Describe the appropriate treatment of patients with hypernatremia with hypovolemia, isovolemia, and hypervolemia.
11. Formulate a treatment plan for a patient with either central or nephrogenic diabetes insipidus.