BIOS251 WK 2 CASE STUDY

Introduction recap:

The human body relies on a delicate balance of water and electrolytes (such as sodium, potassium, and chloride) to maintain proper function. These substances are critical for processes like nerve signaling, muscle contraction, and maintaining blood pressure. When this balance is disrupted, such as during dehydration or an electrolyte imbalance, it can lead to serious health consequences.

Dehydration occurs when the body loses more water than it takes in, often leading to imbalances in electrolytes. This condition can result from various causes, including excessive sweating, inadequate water intake, or consuming diuretics like energy drinks or caffeine. Understanding how electrolytes function and their role in the body's chemistry is vital for providing effective patient care.

In this case study, you will explore a scenario involving a patient experiencing dehydration and electrolyte imbalance. You will apply fundamental concepts, including the properties of water, the importance of ions, and the physiology of hydration, to assess the patient's condition and propose appropriate interventions.

Scenario/Summary

This clinical case highlights how fundamental concepts of chemistry and physiology come together in a healthcare setting. As you work through this case, you will apply your understanding of water balance, electrolytes, and their role in maintaining homeostasis.

Patient Background:
Emilia Laine, a 19-year-old college athlete, arrives at the emergency room with complaints of dizziness, fatigue, and muscle cramps. She reports feeling lightheaded during soccer practice earlier in the day and says these symptoms have progressively worsened. Emilia mentions that she has been drinking energy drinks instead of water over the past week to stay awake for exams, while also attending daily training sessions.

Clinical Findings:

- **Vital Signs:**
  - Heart rate: 112 bpm (tachycardia)
  - Blood pressure: 88/60 mmHg (hypotension)
- **Physical Exam:**
  - Dry mucous membranes
  - Generalized weakness
  - Complaints of confusion and muscle cramps
- **Laboratory Results:**
  - **Electrolytes:**
    - Elevated sodium levels (hypernatremia)
    - Decreased potassium levels (hypokalemia)