Key Electrolytes

Sodium (Na)

Normal range	136-145 mEq/L
Hypernatremia	>145 mEq/L
Hyponatreamia	<136 mEq/L

Sodium: maintains extracellular fluid volume

- **Hypernatremia:** abnormally high levels of sodium in extracellular fluid due to hypovolemia or fluid loss, increased sodium intake, endocrine disorders
  - **Presentation:** thirst, altered mental status, irritability, hyperreflexia, seizure, ataxia, tremors, tachycardia, hypotension
  - **Clinical Implication:**
    - Monitor cardiac rhythm and vital signs. If tachycardia and hypotension are present, there may be decreased activity tolerance
    - Monitor for cognition and neurologic impairment
    - Seizure precautions
    - Consider fluid intake

- **Hyponatremia:** abnormally low levels of sodium due to hypervolemia, dehydration, diuretics, renal or hepatic disease
  - **Presentation:** headache, muscle cramps and twitching, anxiety, nausea, lethargy, hyporeflexia, orthostatic hypotension
  - **Clinical Implication:**
    - Monitor for cognitive impairment
    - Fall prevention screening due to increased fall risk
    - Monitoring and education for orthostatic hypotension

Potassium (K)

Normal range	3.5-5.0 mEq/L
Hyperkalemia	>5.0 mEq/L
Hypokalemia	<3.5 mEq/L

Potassium: important for the function of nerves, muscles and cardiac tissue

- **Hyperkalemia:** abnormally high levels of potassium in the extracellular fluid due to excessive potassium intake, renal insufficiency, Addison's Disease, chronic heparin therapy
  - **Presentation:** muscle weakness, muscle paralysis, paresthesia, dysrhythmia, tachycardia followed by bradycardia, muscle cramping
  - **Clinical Implication:**
    - Patients are at risk for acute cardiac episodes, therefore, vital signs, symptoms, and cardiac rhythm should be monitored.
    - Monitor for decreased activity tolerance.
    - Monitor for acute decrease in muscle performance and may lead to flaccid paralysis.

- **Hypokalemia:** abnormally low levels of potassium in the extracellular fluid due to inadequate potassium intake, diarrhea, vomiting, polyuria, diuretics, fluid overload
  - **Presentation:** extremity weakness, hyporeflexia, paresthesia, leg cramps, arrhythmias, hypotension, constipation, fatigue
  - **Clinical Implication:**
    - Patients are at risk for acute cardiac episodes, therefore, vital signs, symptoms, and cardiac rhythm should be monitored.
    - Monitor for decreased activity tolerance.
    - Monitor for acute decrease in muscle performance and may lead to flaccid paralysis.

Key Electrolytes

Calcium (Ca)

Normal Range	Hypercalcemia	Hypocalcemia
9.0-10.5 mg/dL	>10.5 mg/dL	<9.0 mg/dL

Calcium: important for bone and cell growth, blood coagulation, neurotransmitter release and muscle contractions

- **Hypercalcemia:** abnormally high levels of calcium due to hyperparathyroidism, prolonged immobilization, excessive vitamin D, cancer, dehydration
  - **Presentation:** hyporeflexia, muscle weakness, ventricular dysrhythmia, lethargy, constipation, bone pain, nausea and vomiting, anorexia
  - **Clinical Implication:**
    - Monitor cardiac rhythm, vital signs and symptoms.
    - Potential decrease in activity tolerance.
    - Monitor for acute decrease in muscle performance.
    - Patients undergoing cancer treatments are at risk.
- **Hypocalcemia:** abnormally low levels of calcium due to chronic kidney disease, malnutrition, malabsorption, sepsis
  - **Presentation:**
  - **Clinical Implication:**
    - Monitor for cognitive impairment
    - Fall prevention screening due to increased fall risk
    - Monitoring and education for orthostatic hypotension