

# Serum Electrolytes



**K**

😊 3.5-5.0 mEq/L



Hypokalemia. Commonly due to diuretics. Also due to vomiting, diarrhea, lack of dietary K, excessive alcohol use, CKD, diabetic ketoacidosis, laxatives, excessive sweating, folic acid deficiency

Hyperkalemia. Due to kidney disease, Addison's disease, hormonal disorders, lupus, kidney failure. Also due to medications like ACE inhibitors, ARBs, beta-blockers, some herbal supplements, heparin, NSAIDs, K supplements, some diuretics, antibiotics



**Na**

😊 135-145 mEq/L



Hyponatremia. Due to kidney disease or kidney failure, severe vomiting or diarrhea, diuretics, meds like antidepressants and pain meds, too much water, dehydration, liver disease, heart problems like CHF, adrenal gland disorders like Addison's disease, hypothyroidism, SIADH, diabetes insipidus, Cushing's syndrome which causes high cortisol levels

Hypernatremia. Due to lack of thirst, dehydration, severe, watery diarrhea, vomiting, fever, delirium or dementia, certain meds, poorly controlled diabetes, large burns, kidney disease, diabetes insipidus



**Ca**

😊 9-11 mg/dL



Hypocalcemia. Most commonly due to hypoparathyroidism. Also due to low dietary calcium/Vit D, infections, meds like phenytoin (Dilantin), phenobarbital, and rifampin, stress, anxiety, intense exercise, irregular magnesium or phosphate levels, kidney disease, diarrhea/constipation, phosphate or Ca infusion, cancer

Hypercalcemia. Due to hyperparathyroidism, lung diseases like tuberculosis and sarcoidosis, lung, breast, or blood cancer, side effects of meds like diuretics or lithium, Vit D or Ca supplements, calcium carbonate in antacids, dehydration



**Mg**

😊 1.5-2.5 mg/dL



Hypomagnesemia. Due to decreased absorption of magnesium in the gut or increased excretion of magnesium in the urine, caused by GI diseases like Celiac disease, Crohn's disease, and chronic diarrhea; type 2 diabetes, alcohol dependence, diuretics

Hypermagnesemia. Mg depends on 3 organs: uptake in the intestine, storage in the bone, and excretion in the kidneys. So hypermagnesium is due to problems with intestines, bones, or kidneys. CKD, hemolysis, diabetic ketoacidosis, adrenal insufficiency, hyperthyroidism, hyperparathyroidism, and lithium intoxication.



**Cl**

😊 96-106 mEq/L



Hypochloremia. Chlorine is regulated by the kidneys. Low Cl due to kidney issues, CHF, prolonged diarrhea or vomiting, chronic lung disease, such as emphysema, metabolic alkalosis

Hyperchloremia. Due to chronic or acute kidney disease, severe diarrhea, high salt, saline, or salt water ingestion, bromide poisoning, renal or metabolic acidosis, respiratory alkalosis, long-term use of carbonic anhydrase inhibitors



**Phosphate/Phosphorous**

😊 3-4.5 mg/dL



Hypophosphatemia. Very rare as phosphate is found in many foods. Due to severe malnutrition, such as from anorexia or starvation, alcoholism, severe burns, diabetic ketoacidosis, Fanconi syndrome (a kidney disorder), hyperparathyroidism, chronic diarrhea, vitamin D deficiency (in children), inherited conditions, long term use of drugs such as diuretics, bronchodilators, insulin, corticosteroids, bisphosphonates, acetaminophen

Hyperphosphatemia. The kidneys remove phosphate, so high phosphate is due to kidney problems. Also due to hypoparathyroidism, damage to cells, high vitamin D levels, diabetic ketoacidosis, injuries, serious body-wide infections



**BUN**

😊 6-20 mg/dL or 8-23 if older than 60



BUN levels are used to check kidney function. Low blood urea nitrogen can be due to liver disease, malnutrition, or overhydration.

High BUN levels indicate kidney problems. Also due to dehydration, urinary tract obstruction, CHF, shock, burns, stress, heart attack, GI bleeding



**Creatinine**

😊 0.6-1.2 mg/dL



Low creatinine due to a muscle disease, such as muscular dystrophy, a liver disease (poor liver function interferes with creatine production), excess water loss, low muscle mass (muscle breakdown produces creatinine)

High creatinine is most commonly due to kidney problems. Also due to drugs like cimetidine (Bactrim), high meat consumption, kidney infections, rhabdomyolysis (abnormal muscle breakdown), urinary tract obstruction