

Hypocalcemia and Hypercalcemia

Calcium normal lab value= 9-10.5 mg/dL

Calcium helps maintain bone strength and density, allows nerve impulse transmission, and is important in blood clotting

Calcium and phosphorous have an inverse relationship

When calcium levels are low, parathyroid hormone is secreted by the parathyroid

- Calcium is pulled from bone storage and placed in bloodstream
- Vitamin D absorption is stimulated
- Kidney excretion of calcium is inhibited

When calcium levels are high, thyrocalcitonin is secreted by the thyroid

- Bone resorption is inhibited
- Vitamin D absorption is inhibited
- Kidney excretion of calcium is promoted

Hypocalcemia	Hypercalcemia
Lab value= <9 mg/dL	Lab value= >10.5 mg/dL
Causes: <ul style="list-style-type: none"> - Dietary/ malabsorption - Parathyroid removal, hypoparathyroidism - Vitamin D deficiency - Polyuric phase in kidney failure - Calcium chelators - End stage kidney disease 	Causes: <ul style="list-style-type: none"> - Hyperparathyroidism - Vitamin D excess - Thiazide diuretics - Malignancy - Immobility - Dehydration
Signs/symptoms: <ul style="list-style-type: none"> - Hyperactive DTRs, muscle spasms, muscle twitching - Trousseau's sign, Chvostek's sign - Increased intestinal peristalsis (diarrhea, abdominal cramping) - ECG changes (prolonged ST interval, prolonged QT interval) - Decreased heart rate, hypotension - Paresthesia - Brittle, fragile bones - Seizures 	Signs/symptoms: <ul style="list-style-type: none"> - Hypoactive DTRs, severe muscle weakness - Decreased intestinal peristalsis (constipation, N/V, abdominal pain) - ECG changes (shortened ST segment, widened T wave) - Cardiac alterations- early= increased heart rate; severe, late= depressed cardiac electrical conduction= decreased heart rate and potential cardiac arrest), increased blood pressure - Impaired blood flow (cyanosis, pallor, decreased capillary refill) - Altered LOC- lethargy coma
Treatment: <ul style="list-style-type: none"> - Phosphate binders (Renagel) - Oral and IV calcium replacement - Magnesium sulfate (if severe neuromuscular manifestations) 	Treatment: <ul style="list-style-type: none"> - Calcium chelators (Methracin, Cuprimine) - Rehydration- IV NS 0.9% - Furosemide (if diuretic is indicated) - Dialysis (if severe)

Nursing Considerations:

Seizures precautions for hypocalcemia

- Quiet room with dim lights, keep noise to a minimum
- Oxygen and suction at bedside
- IV access
- Bed in lowest position, mattress on floor beside the bed

Infuse IV calcium slowly, patient should be on cardiac monitoring

Menopausal women are at an increased risk for hypocalcemia, therefore may experience brittle and fragile bones. All patients with hypocalcemia should be handled with care during repositioning, transferring, and ambulating. They are at increased risk of sustaining a fracture if injury were to occur.