

# Hypocalcemia

## Evaluation:

- verify with repeat measurement that there is a true decrease in the serum calcium concentration (total serum calcium corrected for albumin or ionized calcium)
- Note alkalosis augments calcium binding to albumin and increases severity of symptoms
- Compare with previous values if available
- If the patient has a low albumin-corrected serum calcium or ionized calcium concentration, further evaluation to identify the cause is indicated
- Obtain thorough history and physical examination.
- measure serum intact parathyroid hormone (PTH)
- Other measurements that may be helpful include serum magnesium, creatinine, phosphate, vitamin D metabolites (primarily 25-hydroxyvitamin D [25(OH)D]), and alkaline phosphatase.

## Causes:

- renal failure
- hypoparathyroidism or pseudohypoparathyroidism (PTH resistance)
- severe hypomagnesemia or hypermagnesemia
- acute pancreatitis
- rhabdomyolysis
- tumor lysis syndrome
- vitamin D deficiency

## Signs:

- paresthesias, tetany (especially carpopedal spasm), lethargy, confusion, seizures,

Trousseau's sign, Chvostek's sign, decreased cardiac function, QT prolongation

## Treatment:

- Symptomatic hypocalcemia ( see symptoms above) or asymptomatic hypocalcemia with an acute decrease in serum corrected calcium to  $\leq 7.5$  mg/dL ( $\leq 1.9$  mmol/L) or ionized calcium to  $\leq 3$  mg/dL ( $\leq 0.8$  mmol/L) should be corrected by replacement with calcium gluconate IV.

- 1 or 2 g of calcium gluconate, equivalent to 90 or 180 mg elemental calcium, in 50 mL of 5% dextrose or normal saline) can be infused over 10 to 20 minutes
- If present, low Mg should also be corrected because it contributes to low Ca.

For those with milder symptoms of neuromuscular irritability (paresthesias) and corrected serum calcium concentrations greater than 7.5 mg/dL (1.9 mmol/L) or a serum ionized calcium concentration greater than 3.0 mg/dL (0.8 mmol/L), initial treatment with oral calcium supplementation is sufficient. If symptoms do not improve with oral supplementation, IV calcium infusion is required.

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