

## HYPERCALCEMIA

**DEFINITION:** Total serum calcium level > 10.4 mg/dL.

**INCIDENCE IN CRITICAL ILLNESS:** Rare (1-15%).

### **ETIOLOGY:**

- **Excessive bone resorption:** Prolonged immobility; paraneoplastic syndromes; hyperparathyroidism.
- **Humoral hypercalcemia of malignancy.**
- **Miscellaneous:** Sarcoidosis; medications (thiazide diuretics).

### **CLINICAL MANIFESTATIONS:**

- **Mild hypercalcemia is asymptomatic.**
- **Levels > 12 mg/dL may be symptomatic.**
- **Cardiovascular:** Hypotension; hypovolemia; shortened QT interval.
- **Neuromuscular:** Skeletal muscle weakness.
- **Psychiatric:** Confusion; delirium; psychosis; coma.
- **Gastrointestinal:** Nausea; emesis; constipation; abdominal pain; ileus.

### **TREATMENT:**

- Indicated with levels > 14 mg/dL and in symptomatic hypercalcemia.
- Plasma volume expansion + forced kaliuresis (furosemide).
- Management of the underlying etiology.
- Malignancy: salmon calcitonin, pamidronate or plicamycin (inhibitors of bone resorption).
- Multiple myeloma: calcitonin + hydrocortisone.
- Hemodialysis: rarely used in the acute setting.
- Parathyroidectomy: reserved for failure of medical management; rarely indicated in the acute setting.

### **KEY REFERENCES:**

- Forster J, Querusio L, Burchard KW, et al. Hypercalcemia in critically ill surgical patients. *Ann Surg* 1985;202:512-518.
- Lind L, Ljunghall S. Critical care hypercalcemia—a hyperparathyroid state. *Exp Clin Endocrinol* 1992;100:148-151.