



**Symptoms**  
 Bone pain, fractures  
 Renal colic  
 Nausea, vomiting, pancreatitis  
 Muscle weakness, paresthesias  
 Delirium, coma, stupor

**EKG Abnormalities**  
 Shortened QTc  
 Osborn waves  
 AV block

**Things that worsen hypercalcemia:**  
 Medications: lithium, thiazide diuretics, Vitamin A or D excess  
 Dehydration  
 Inactivity  
 High calcium diet

**Volume resuscitation**  
 Start w/ 1-2L bolus of NS or normosol  
 - LR contains calcium  
 - Goal = euvolemi  
 Most patients require 3-6L in first 24h  
 Consider starting continuous fluids (normosol) at 150-250 cc/hr

**Calcitonin**  
 Dose = 4u/kg subQ q12 hours  
 Works within several hours but has tachyphylaxis after ~ 2 days

**Bisphosphonates**  
 Use zoledronic acid 4mg IV over 15 minutes  
 Does not work for ~48 hours  
 Avoid in renal dysfunction

Created: 8/17/20  
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