

HYPOCALCEMIA

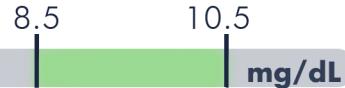
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CLINICAL MANIFESTATION

SERUM CALCIUM
PHYSIOLOGICAL RANGE:



Neuromuscular

Numbness, tingling, tetany, spasm
Perioral area
Muscles
Laryngospasms "CATTs go Numb" (Convulsion, Arrhythmia, Tingling, Tetany, Spasms, Numbness)

Cardiac

Prolonged QTc
ST segment Elevation
Mimics Myocardial Infarct

Neuronal

Seizures

PHYSICAL EXAM

CHVOSTEK'S

Tapping facial nerve
→ facial muscle spasms

TROUSSEAU'S

Occlusion of brachial a. with BP cuff
→ carpal muscle spasms

$\downarrow \text{Ca}^{2+}$
 < 8.5

$\uparrow \text{PTH}$

PTH

*Pearl: Alkalemia causes transient hypocalcemia
- Less ionized calcium relative to bound

PTH INDEPENDENT

PTH DEPENDENT

LOW VIT D

Deficiency
- ↓ Exposure (sunlight)
- ↓ Intake (diet)

Activation

- Liver disease
- Kidney Disease (CKD)

Metabolism

- Drugs (phenytoin)

NORMAL VIT D

Accelerated Bone Formation
- Hungry Bone Syndrome

Calcium Sequestration
- Pancreatitis
- Blood Transfusions

Medications
- Bisphosphonates
- Denosumab

INADEQUATE PTH

Iatrogenic*
- Surgery, Radiation
Mg⁺ deficiency

Infiltrative
- Amyloid
- TB (granuloma)

Autoimmune
- APS 1

DiGeorge Syndrome

$\downarrow \text{PTH}$

PTH RESISTANCE

Pseudohypoparathyroidism
- Alteration in PTH Signaling

$\uparrow \text{PTH}$

* - MOST COMMON

EVALUATION

1ST = Repeat calcium & correct for albumin

LABS

Calcium [8.5 - 10.5]
PTH
Albumin
Ionized Ca²⁺
25-hydroxyvitamin D
Mg⁺
Phosphate

MANAGEMENT

GUIDED BY DEGREE OF HYPOCALCEMIA, TEMPO AND THE PATIENT'S SYMPTOMS

SEVERE

- $\text{Ca}^{2+} < 7.5 \text{ mg/dL} / \text{ionized Ca}^{2+} < 1 \text{ mg/dL}$

Symptoms: e.g. - Tetany

Treatment: IV Calcium gluconate, 1-2g over 10-20min

MILD

- $\text{Ca}^{2+} > 7.5 \text{ mg/dL}$

Symptoms: e.g. - Perioral numbness

Treatment: PO Ca²⁺ and calcitriol

Address the underlying cause of $\downarrow \text{Ca}^{2+}$:

Concomitant vitamin D deficiency - Supplement

CKD - Supplement calcitriol to bypass

renal activation of vitamin D synthesis

