

**Always follow local guidelines and discuss with Senior if unsure  
Especially patients with significant fluid / electrolyte losses or  
those with co-morbidities such as Heart / Renal Failure**

**Normal range: 2.2 - 2.7mmol/L**

**Normal range ionized: 1.1 - 1.3mmol/L - reported on ABG**

## SIGNS AND SYMPTOMS

**MILD  
1.9-2.2 mmol/L**

**SEVERE / LIFE THREATENING  
< 1.9 mmol/L or symptomatic**

### Asymptomatic / Mild:

- Perioral numbness
- Digital paresthesia
- Muscle cramps
- Irritability

- Arrhythmias:
  - Long QT
- Acute heart failure
- Hypotension
- Seizures
- Laryngospasm
- Tetany

**< 1.9mmol/L or Symptoms at any level < 2.2 is a  
MEDICAL EMERGENCY - CONTACT SENIOR IMMEDIATELY**

## CAUSES

### ENDOCRINE

#### Parathyroidectomy

#### Hypoparathyroidism:

- Commonly post thyroidectomy

#### Increased Calcitonin:

- Medullary thyroid carcinoma

#### Magnesium Deficiency

#### Vitamin D Deficiency

### REDISTRIBUTION

#### Alkalosis

#### Hyperphosphataemia:

- Chronic renal failure
- Rhabdomyolysis

#### Pancreatitis

#### Overhydration

#### Medications:

- Bisphosphonates
- PPI (Hypomagnesia)

### REDUCED INTAKE

#### Low calcium in diet

#### Low Vitamin D

#### Re-feeding syndrome

#### Medications:

- Phenytoin (increases metabolism of Vit D)

### INCREASED LOSSES

#### Renal loss:

- Loop Diuretics

#### Large volume loss transfusions

## GENERAL MANAGEMENT

**>1.9mmol/L  
-and-  
Asymptomatic**

**SANDOCAL 1000  
2 Tablets BD PO/NG**

#### Alternatives:

- ADCAL 3 Tablets BD
- CACIT 4 Tablets BD
- CALCICHEW 2 Tablets BD

Always check Vitamin D level and replace as required: Load with 300,000 units total COLECALCIFEROL over 6-8 weeks

Always check Mg level and replace as required

**MEDICAL EMERGENCY - CONTACT SENIOR IMMEDIATELY**

**<1.9mmol/L  
-or-  
Symptomatic at  
any level**

**IV CALCIUM GLUCONATE**

10-20ml 10% in 50-100ml 5% Dex over 10 minutes

#### Monitoring

- Cardiac telemetry during IV infusion

**Repeat until asymptomatic**

**IV CALCIUM GLUCONATE**

100ml 10% in 1000ml NaCl 0.9% or 5% Dextrose at rate 50-100ml/hour

#### Monitoring

- Telemetry during IV infusion

**Titrate until normocalcaemia**

Always check Mg level and replace as required

**Always consult BNF for dose / administration and contraindications for all above medications**

**If patient at risk / has RE-FEEDING SYNDROME - see linked document for further advice**