HYPOCALCEMIA

Definition

A **decrease in the SERUM CALCIUM <8.5mg/dl** or IONIZED CALCIUM **<3-4.4mg/dL is termed as hypocalcemia**

CAUSES OF HYPOCALCEMIA

1)HYPOALBUMINEMIA

2)HYPOPARATHYROIDISM
a)Post Surgical b)Idiopathic

3)DEFECT IN VITAMIN D METABOLISM
a)Nutritional
b)Malabsorption and Drugs(anticonvulsants)
c)Liver and Renal diseases

4)MISCELLANEOUS
a)Metabolic or Respiratory Alkalosis b)Sepsis
c)Massive Blood transfusion
d)Tumour lysis e)Rhabdomyolysis

NOTE

In Hypoalbuminemia the Total calcium levels are reduced but ionized calcium is normal

PATHOPHYSIOLOGY

Decrease in extracellular Ca2*+

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The membrane potential on the outside becomes less negative

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Less amount of depolarisation is required to initiate action potential

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Increased excitability of muscle and nerve tissue

HISTORY

1. REDUCED FOOD/NUTRITIONAL INTAKE
2. H/O SURGERY OF PARATHYROID
3. H/O RADIATION
4. H/O BLOOD TRANSFUSION

CLINICAL FEATURES

1. WEAKNESS
2. CIRCUMORAL PARAESTHESIA
3. DISTAL EXTREMITY PARAESTHESIA
4. MUSCLE SPASM
5. CARPOPEDAL SPASM
6. TETANY
7. IRRITABILITY/DEPRESSION/PSYCOSIS

PHYSICAL EXAMINATION

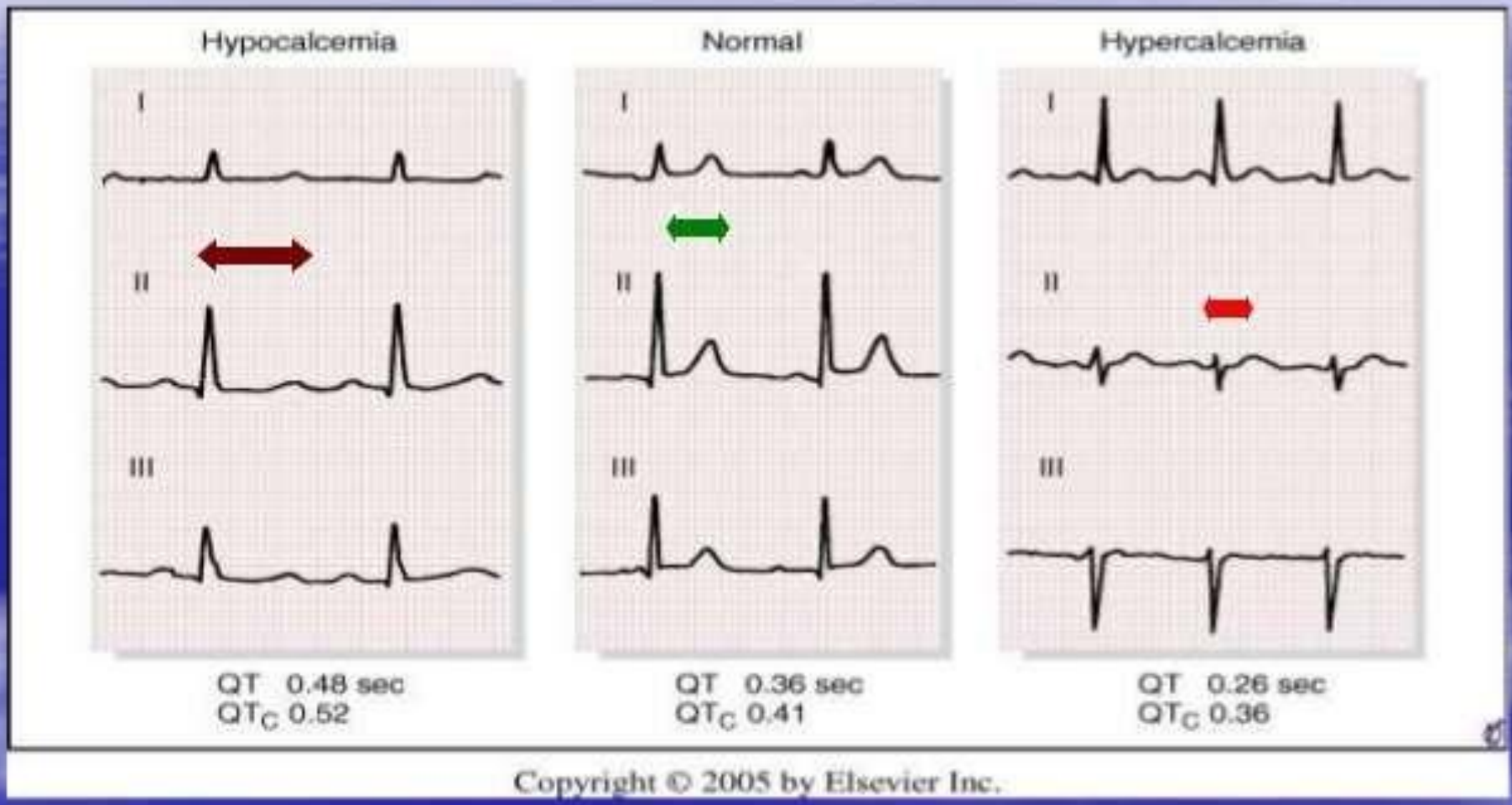
1)CHVOSTEK'S SIGN
2)TROSSEAU'S SIGN

INVESTIGATIONS

- Serum Calcium (Total and Ionic calcium)
- Serum Albumin (3.5-5.3g/dL)
- Serum Phosphorus (2.7-4.5mg/dL)
- Serum Magnesium (0.7-1.0mmol/L)
- Urinary calcium excretion (100-250mg/24h)
- KFT
- 25-hydroxyvitamin D levels (>20ng/ml)
- Serum PTH (10-65pg/ml)

*ECG-PROLONGED QT INTERVAL

ECG CHANGES



- Prolongation of the QT interval (ST segment portion) is typical of hypocalcemia.

TREATMENT

- **ACUTE MANAGEMENT**
- LONG TERM MANAGEMENT
- VITAMIN D SUPPLEMENTATION

ACUTE MANAGEMENT

- Goals of Therapy
- Total Serum Ca 8.6-10.2 mg/dl (2.15-2.55 mmol/L) or
- Ionized serum Ca > 4.5 mg/dl or > 1.12 mmol/L
- Manage underlying illness

Management

Mild to moderate : Oral supplementation

IV Calcium

Intermittent iv boluses for severe symptomatic (total serum ca < 7.5 mg/dl or < 1.9 mmol/L) or ionzied Ca < 4 mg/dl or < 1 mmol/L

Symptomatic hypocalcemia is an emergency

Administer 1 g Calcium chloride or Ca Gluconate(1000 mg of elemental calcium/10ml) iv over 10 minutes

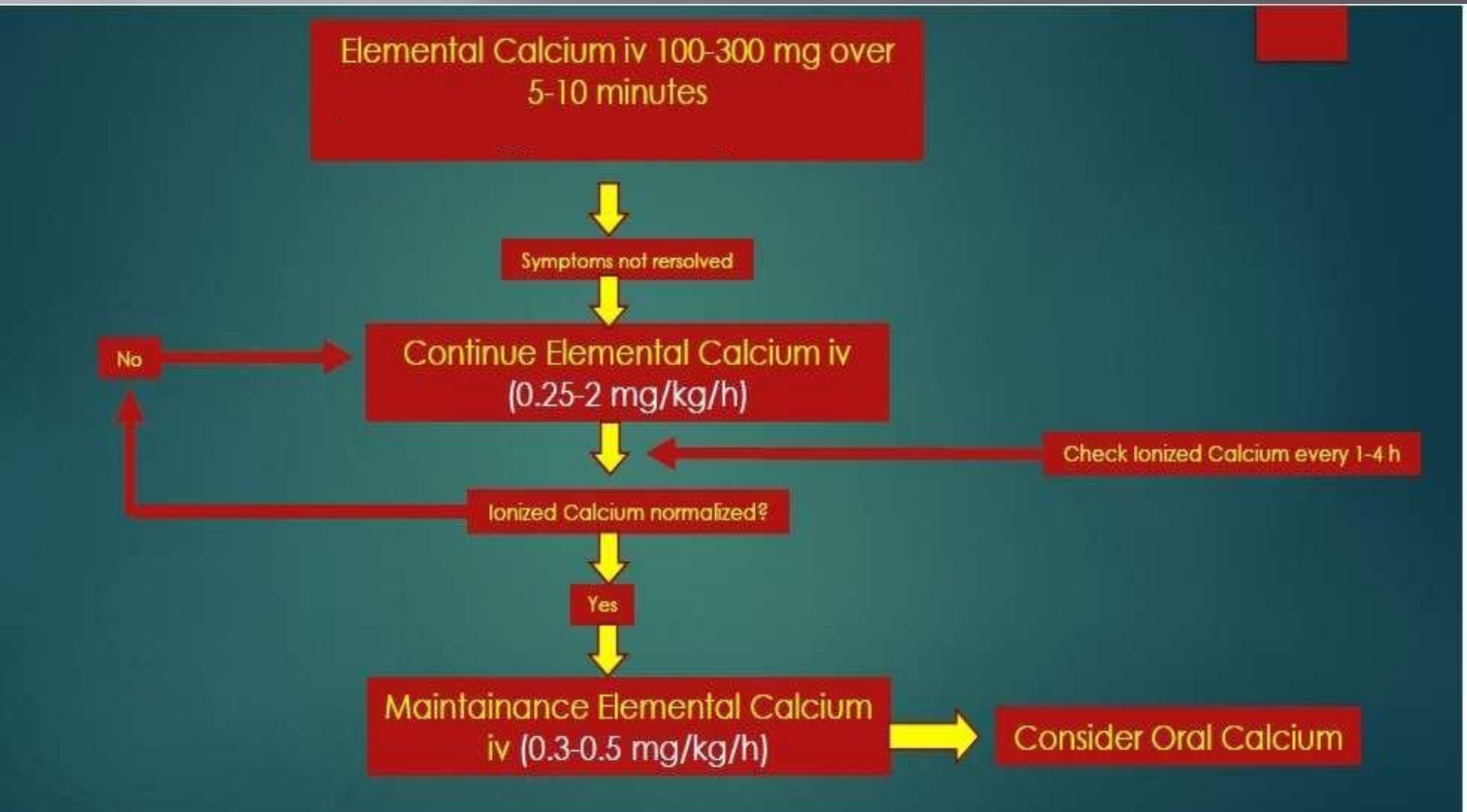
Refractory hypocalcemia: Continuous infusion of elemental calcium

CALCIUM PARENTERAL: PRODUCTS			
Product	Available solutions	Elemental calcium content per 1000 mg of solution	Route of Administration
Calcium gluconate	10%	92 mg (4.65 mEq)	Peripheral/central
Calcium chloride	10%	272 mg (13.6 mEq)	Central

NOTE : AVOID RINGER LACTATE WHEN INFUSING CALCIUM PREPARATIONS


For I.V. Use
JACKSON
Calcium Gluconate Inj
CALCY-MB
Calcium Gluconat
0 ml.
Rx
CALCIUM GLUC
Mfg. Lic. No.: NKD-22
Batch No. : V15028
Mfg. Date : 01/2015
Exp. Date : 12/2017

Mx OF SEVERE SYMPTOMMATIC HYPOCALCEMIA



LONG TERM MANAGEMENT

TREATMENT OF UNDERLYING CAUSE

ORAL ELEMENTAL CALCIUM 1-3gm /DAY GIVEN BETWEEN MEALS

VITAMIN D SUPPLEMENTATION

	Hypocalcemia	Hypercalcemia
CNS	Irritability & anxiety Paresthesias Seizures Laryngospasm Bronchospasm	Decreased ability to concentrate Increased sleep requirement Depression Confusion and Coma Death
CVS	Heart failure	Arrhythmias Bradycardia
MSK	Muscle cramps	Muscle weakness

THANK YOU