Paramedic

CALCIUM

Description

Cardioprotective agent in hyperkalemia. Calcium chloride contains 3 times the amount of elemental calcium contained in the same volume of calcium gluconate. Therefore, 1g (10 ml) vial of calcium chloride 10% solution contains 273 mg of elemental calcium, whereas 1 g (10 ml) of 10% calcium gluconate contains 90 mg of elemental calcium. For this reason, larger doses of calcium gluconate are required. Doses below refer to dose of calcium solution, not elemental calcium.

Indications

- Adult pulseless arrest associated with any of the following clinical conditions:
  - Known hyperkalemia
  - Renal failure with or without hemodialysis history
  - Calcium channel blocker overdose
- **Not indicated for routine treatment of pulseless arrest**
- Calcium channel blocker overdose with hypotension and bradycardia
- Renal failure with known or suspected hyperkalemia
- Crush or suspension injury with known or suspected hyperkalemia
- Hemorrhagic Shock / Mass Transfusion Pre-treatment

Contraindications

- Known hypercalcemia
- Suspected digoxin toxicity (i.e. digoxin overdose)

Side Effects/Notes

- Extravasation of calcium chloride solution may cause tissue necrosis.
- Because of the risk of medication error, if calcium chloride is stocked, consider limiting to 1 amp per medication kit to avoid accidental overdose. Calcium gluconate solution will require 3-amp supply for equivalent dose.
- Must give in separate line from IV sodium bicarbonate to prevent precipitation/formation of calcium carbonate.
- In setting of digoxin toxicity, may worsen cardiovascular function.

Dosage and Administration

Calcium Gluconate 10% Solution

Adult

- **Hemorrhagic Shock / Mass Transfusion Pre-treatment**
  - 3 g IV/IO
- **Renal Failure with known or suspected hyperkalemia Crush or suspension injury with known or suspected hyperkalemia**
  - 3 gm (30 mL) IV/IO over 5 minutes.
- **Pulseless arrest assumed due to hyperkalemia:**
  - 3 g (30 ml) slow IV push
- **Calcium channel blocker overdose with hypotension and bradycardia**
  - **Contact Base** for order. 3 g (30 ml) slow IV/IO push.
  - Dose may be repeated every 10 minutes for a total of 3 doses.

Pediatric

- **Calcium channel blocker overdose with hypotension for age and bradycardia:**
  - **Contact Base** for order. 60 mg/kg (0.6 ml/kg), not to exceed 1 g slow IV/IO push not to exceed 2 ml/minute, may repeat every 10 minutes for total of 3 doses.

CALCIUM (*Continued*)

Calcium Chloride 10% Solution

Adult

Hemorrhagic Shock/ Mass Transfusion Pre-Treatment

1 g slow IV/IO push

Pulseless arrest assumed due to hyperkalemia:

1 g (10 ml) slow IV push

Calcium channel blocker overdose with hypotension and bradycardia:

Contact Base for order. 1 g (10 ml) slow IV/IO push. Dose may be repeated every 10 minutes for total of 3 doses.

Renal failure with known or suspected hyperkalemia Crush or suspension injury with known or suspected hyperkalemia

o 1 gm (10 mL) IV/IO over 5 minutes.

Pediatric

Calcium channel blocker overdose with hypotension for age and bradycardia:

Contact Base for order. 20 mg/kg (0.2 ml/kg), not to exceed 1 g slow IV/IO push not to exceed 1 ml/min, may repeat every 10 minutes for total of 3 doses.

Protocol

- Universal Pulseless Arrest
- Poisoning/Overdose
- Mass Transfusion