

Calcium Salts (Calcium Chloride & Calcium Gluconate)

Indication(s): Remote Damage Control Resuscitation (Administration of ≥ 4 units of blood products containing citrate).

Contraindications: Severe renal disease.

Precautions: Tissues of the cardiovascular system are sensitive to the concentration of calcium in blood. Bradycardia, cardiac arrhythmias, cardiac arrest, decreased blood pressure, vasodilation and syncope may result.

Drug Interactions: Calcium may decrease the therapeutic effect of calcium channel blockers (CCBs) (Monitor for therapeutic effect of CCBs). Thiazide diuretics may decrease excretion of calcium and may increase risk of hypercalcemia (Monitor).

Adverse Effects: ($\geq 1\%$) Tissue irritation and necrosis may occur if extravasation occurs during IV administration, particularly with the chloride salt. ($< 1\%$) Hypotension, bradycardia, cardiac arrhythmias, syncope and cardiac arrest may occur with rapid IV administration. Tingling sensations, “chalky” taste, and a sense of oppression or “heat waves” have also been reported.

Pharmacology: Calcium is the most abundant mineral in the human body and is essential for maintaining the functional integrity of nervous and musculoskeletal systems as well as cell membrane and capillary permeability. Citrate is a preservative used in blood and some blood product preparations. It chelates free plasma calcium and, during massive transfusion, can precipitate hypocalcemia. IV calcium is administered after ~ 4 units of blood product to counter this effect.

Dosage and Administration: First Line Therapy – 10% Calcium Gluconate 3g IV/IO as a single dose **OR** Second Line Therapy – 10% Calcium Chloride 1 g IV/IO as a single dose.