

Alert	<p>Multiple forms of calcium exist with varying amounts of elemental calcium expressed in varying units. Therefore careful attention is required in prescription and administration of calcium to avoid over- or under-dosing.</p> <p>Conversion factor for elemental Ca: 1 mg = 0.02 mmol = 0.05 mEq.</p> <p>Prescribe calcium in mmol/kg/dose (not in mL/kg/dose)</p> <p>Calcium can slow the heart rate and precipitate arrhythmias. In cardiac arrest, calcium may be given by rapid intravenous injection. In the presence of a spontaneous circulation give it slowly.</p> <p>Do not give calcium solutions and sodium bicarbonate simultaneously by the same route to avoid precipitation.</p> <p>Calcium chloride 10% may be preferred over calcium gluconate 10% for rapid IV administration.</p> <p>Calcium gluconate in glass vials should not be used for repeated or prolonged treatment due to the high aluminium content.</p>
Indication	<p>Asymptomatic or symptomatic hypocalcaemia.</p> <p>Hyperkalaemia.</p> <p>Exchange transfusion.</p> <p>Magnesium toxicity.</p> <p>Calcium channel blocker overdose.</p> <p>Supplementation in parenteral nutrition (beyond the scope of this guideline).</p>
Action	<p>Calcium is essential for the functional integrity of the nervous, muscular, skeletal and cardiac systems and for clotting function. It antagonises the cardiotoxic effects (arrhythmias) of hyperkalaemia, hypermagnesaemia and calcium channel blockers.</p>
Drug Type	Mineral.
Trade Name	Calcium Gluconate Injection [Phebra] 10% injection (calcium 0.22 mmol/mL)
Maximum Dose	3 mmol/kg/day ²⁵
Presentation	Calcium gluconate 10% 10 mL vial contains 0.22 mmol/mL of elemental calcium. ²³
Dosage/Interval	<p>Hypocalcaemia, hyperkalaemia, magnesium toxicity, calcium channel blocker overdose</p> <p>IV or IO: Elemental Calcium - 0.15 mmol/kg (= 0.7mL/kg of UNDILUTED 10% calcium gluconate). Repeat as necessary.</p> <p>Maintenance IV calcium therapy – Titrate to serum calcium levels</p> <p>IV bolus: Elemental Calcium – 0.15 mmol/kg/dose 4-6 hourly (maximum daily dose 3 mmol/kg/day)</p> <p>Exchange transfusion: Administer if hypocalcaemia:</p> <p>IV: Elemental calcium 0.23 mmol/kg (= 1 mL/kg of UNDILUTED Calcium gluconate 10%); repeat as necessary.</p>
Route	IV (via a central line where possible). Oral (see separate guideline 'Calcium- ORAL')
Preparation/Dilution	<p>Calcium gluconate – IV intermittent</p> <p>Draw up 4.5 mL (1.0 mmol) and add 5.5 mL of sodium chloride 0.9%, glucose 5% or glucose 10% to make a final volume of 10 mL with a concentration of 0.1 mmol/mL. Infuse dose over 10–60 minutes via a central line (if possible).</p> <p>Calcium gluconate – cardiac arrest (secondary to hyperkalaemia, hypocalcaemia, hypermagnesaemia or calcium channel blocker)</p> <p>Infuse undiluted over 5 – 10 minutes via a central line (if possible).</p>
Administration	<p>Calcium gluconate – IV intermittent</p> <p>In cardiac arrest, calcium may be given by rapid intravenous injection.</p> <p>In the presence of a spontaneous circulation give it slowly. Infuse dose over 10–60 minutes (5-10 minutes in cardiac arrest) via a central line (if possible and compatibilities permit). If NO central access is available, consult the Neonatologist on service before administering via peripheral route. If administering peripherally give via a large vein.</p>

Calcium Gluconate

Newborn Use only

2018

	In poorly perfused patients, consider diluting the infusion further (two-fold) and infuse over at least TWO hours. MUST NOT be injected intra-arterially, intramuscularly or subcutaneously.
Monitoring	Continuous ECG monitoring to monitor heart rate and rhythm (stop infusion if HR < 100 bpm). Measurement of ionised calcium preferred over total calcium. Blood gas machines measure ionised calcium directly and are more accurate than the main pathology laboratory which calculates the ionised calcium from a complex formula. Observe IV tubing for precipitates. Observe IV insertion site for extravasation. Correct hypomagnesaemia if present.
Contraindications	Caution in patients with renal or cardiac impairment.
Precautions	Do not give calcium solutions and sodium bicarbonate simultaneously by the same route to avoid precipitation. Ensure IV calcium is administered at a different time to phosphates, carbonates, sulfates or tartrates (precipitates can occur).
Drug Interactions	Ceftriaxone (may cause insoluble precipitates and can be fatal), digoxin (serious risk of arrhythmia and cardiovascular collapse), thiazide diuretics (increased risk of hypercalcaemia), ketoconazole (decreased ketoconazole effect).
Adverse Reactions	Rapid administration is associated with bradycardia or asystole. Rash, pain, burning at injection site, cutaneous necrosis with extravasation (give via central line unless otherwise instructed by a neonatologist) Nephrolithiasis with long-term use. Gastric irritation, diarrhoea and NEC have occurred during oral therapy with hyperosmolar preparations (must be diluted if used orally. See separate guideline Calcium - ORAL)
Compatibility	Fluids: Glucose 5%, glucose 10%, Hartmann's, sodium chloride 0.9% Y-site: Amifostine, amiodarone, aztreonam, bivalirudin, ceftaroline fosamil, cisatracurium, dexmedetomidine, doripenem, filgrastim, granisetron, heparin sodium, hydrocortisone sodium succinate, labetalol, linezolid, midazolam, milrinone, piperacillin-tazobactam (EDTA-free), potassium chloride, remifentanyl.
Incompatibility	Fluids: Fat emulsion Y-site: Adrenaline (epinephrine) hydrochloride, cefalotin, ceftriaxone, clindamycin, dexamethasone, dobutamine, flucloxacillin, fluconazole, foscarnet, indometacin, methylprednisolone sodium succinate, metoclopramide, mycophenolate mofetil, sodium bicarbonate, thiopentone, carbonate, phosphate and sulfate salts. Do not mix with any medication that contains phosphates, carbonates, sulfates or tartrates.
Stability	Calcium gluconate is a supersaturated solution and may precipitate in the vial at room temperature. Inspect the vial before use. IV diluted solution: Do not use if discoloured, cloudy, turbid or if a precipitate is present. Discard remaining solution after use.
Storage	Ampoule: Store below 25°C.
Special Comments	Refer to full version.
Evidence summary	Refer to full version.
References	Refer to full version.

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