

# Calcium chloride 10%

## Newborn Use only

2018

<b>Alert</b>	<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><b>Conversion factor for elemental Ca: 1 mg = 0.02 mmol = 0.05 mEq.</b></p> <p><b>Prescribe calcium in mmol/kg/dose (not in mL/kg/dose)</b></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. 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>
<b>Indication</b>	<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>
<b>Action</b>	<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>
<b>Drug Type</b>	Mineral.
<b>Trade Name</b>	Calcium Chloride Injection (Phebra) 10%
<b>Maximum Dose</b>	IV – 3 mmol/kg/day <sup>21</sup>
<b>Presentation</b>	Calcium chloride 10% 10 mL vial (1 mL contains 100 mg calcium chloride equivalent to 0.68 mmol of elemental calcium).
<b>Dosage/Interval</b>	<p><b>Hypocalcaemia, hyperkalaemia, magnesium toxicity, calcium channel blocker overdose</b></p> <p>IV or IO: Elemental Calcium - 0.15 mmol/kg (= 0.2mL/kg of <b>UNDILUTED</b> 10% calcium chloride). Repeat as necessary.</p> <p><b>Maintenance IV calcium therapy – Titrate to serum calcium levels</b></p> <p>IV bolus: Elemental Calcium – 0.15 mmol/kg/dose 4-6 hourly (maximum daily dose 3 mmol/kg/day)</p> <p><b>Exchange transfusion: Administer if hypocalcaemia:</b></p> <p><b>IV:</b> Elemental calcium 0.23 mmol/kg (=0.3mL/kg of <b>UNDILUTED</b> 10% calcium chloride); repeat as necessary.</p>
<b>Route</b>	IV (via a central line where possible), IO. Oral (see separate guideline 'Calcium- ORAL').
<b>Preparation/Dilution</b>	<p><b>Calcium Chloride – IV intermittent</b></p> <p>Draw up 1.5 mL (1.02 mmol of elemental calcium) and add 8.5 mL 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><b>Calcium Chloride – cardiac arrest(secondary to hyperkalaemia, hypocalcaemia, hypermagnesaemia or calcium channel blocker)</b></p> <p>Infuse undiluted over 5 – 10 minutes via a central line (if possible).</p>
<b>Administration</b>	<p><b>Calcium chloride – IV intermittent</b></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> <p>In poorly perfused patients, consider diluting the infusion further (two-fold) and infuse over at least TWO hours.</p> <p>MUST NOT be injected intra-arterially, intramuscularly or subcutaneously.</p>
<b>Monitoring</b>	Continuous ECG monitoring to monitor heart rate and rhythm (stop infusion if HR < 100 bpm).

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	Measurement of ionised calcium preferred over total or corrected calcium concentration. 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.
<b>Contraindications</b>	Caution in patients with renal or cardiac impairment.
<b>Precautions</b>	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).
<b>Drug Interactions</b>	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).
<b>Adverse Reactions</b>	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)
<b>Compatibility</b>	Fluids: Glucose 5%, glucose 10%, sodium chloride 0.9%  Y-site: Amiodarone, ceftaroline fosamil, esmolol, sodium nitroprusside.
<b>Incompatibility</b>	Fluids: Lipid emulsion  Y-site Adrenaline (epinephrine) hydrochloride, azathioprine, ceftazidime, ceftriaxone, cefazolin, dexamethasone, folic acid, foscarnet, haloperidol lactate, hydrocortisone sodium succinate, indomethacin, ketorolac, magnesium sulfate,, methylprednisolone sodium succinate, phosphate salts, propofol, sodium bicarbonate, thiopentone.  <b>Do not mix with any medication that contains phosphates, carbonates, sulfates or tartrates.</b>
<b>Stability</b>	IV diluted solution: Do not use if discoloured, cloudy, turbid or if a precipitate is present. Discard remaining solution after use.
<b>Storage</b>	Ampoule: Store below 25°C.
<b>Special Comments</b>	Refer to full version.
<b>Evidence summary</b>	Refer to full version.
<b>References</b>	Refer to full version.

<b>Original version Date: 24/08/16</b>	<b>Author: NMF Consensus Group</b>
<b>Current Version number: 1.2</b>	<b>Version Date: 6/04/2018</b>
<b>Risk Rating: Medium</b>	<b>Due for Review: 6/04/2021</b>
<b>Approval by: JHCH CQ&amp;PCC</b>	<b>Approval Date: 24/07/2018</b>

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