

## CALCIUM GLUCONATE

<b>Trade Name</b>	Calcium gluconate® (DBL)
<b>Class</b>	Mineral, electrolyte, vasopressor
<b>Mechanism of Action</b>	Membrane stability (protective if hyperkalaemic), neural and muscle depolarisation; bone formation.
<b>Contraindications/ Cautions</b>	<p><b>Do not give Subcutaneously, Intramuscularly or via scalp veins.</b></p> <p>Caution advised for peripheral administration due to risk of extravasation, tissue necrosis and calcium deposition.</p> <p>Hypercalcaemia.</p> <p>Caution in digitalised patients and in renal/cardiac failure – dose adjustment may be required.</p> <p>Risk of aluminium toxicity associated with repeated/ prolonged use.</p>
<b>Supplied As</b>	10% injection (100mg/mL= 0.22mmol calcium/mL)
<b>Indication 1:</b>  <b>Dosage</b> <b>Interval</b> <b>Administration</b>	<p><b>Maintenance requirements</b></p> <p>In many cases daily requirement will be supplied via calcium content in TPN</p> <p>Calcium can be added to a Premix bag or an individual electrolyte solution made (see Neonatal Handbook for information)</p> <p>1-3mmol/kg/day</p> <p>Continuous infusion over 24 hours</p> <p>Preference is to infuse via a central venous catheter if possible</p> <p><b>For central infusion:</b></p> <p>Maximum dose of 3 mmol/kg/day</p> <p>Do not exceed 50mL Calcium gluconate per 500mL bag to make a concentration of 0.022 mmol/mL</p> <p><b>For peripheral infusion:</b></p> <p>Maximum dose of 1mmol/kg/day</p> <p>Do not exceed 15mL Calcium gluconate per 500mL bag to make a concentration of 0.006 mmol/mL</p>
<b>Indication 2:</b>  <b>Dilution</b>  <b>Dosage</b> <b>Interval</b>	<p><b>Acute replacement in symptomatic hypocalcaemia</b> (ionised calcium &lt;0.8mmol/L)</p> <p>Dilute 1:5 in compatible fluid – concentration of 0.045 mmol/mL</p> <p>Dilute 1:1 in compatible fluid - concentration of 0.11 mmol/mL may be used if strict fluid restriction is needed</p> <p>0.45mmol/kg</p> <p>6 hourly as required</p>

<b>Administration</b>	<p>IV infusion over 1-6 hours via central venous line  The slower infusion rate over 6 hours is preferred for safety  Maximum infusion rate 0.022 mmol/kg/min  In emergency situations (eg, seizures, hypotension) a more rapid infusion over 5-10 min may be given but note that it will exceed the maximum infusion rate stated above and should be an SMO decision  Infuse separately</p> <p><b>Example</b> for 1.2 kg baby:  Give 0.45 mmol/kg = 2 ml/kg = 2.4 mls  Dilute with 5% dextrose to make up final volume 12ml (1:5 dilution, concentration 0.045 mmol/mL) and infuse over 6 hours</p>
<b>Indication 3:</b>  <b>Dilution</b>  <b>Dosage</b>  <b>Interval</b> <b>Administration</b>	<p><b>Exchange transfusion</b> (counteract citrate, anticoagulant).</p> <p>Dilute 1:1 with water for injection.</p> <p>1mL(0.22mmol) diluted with 1mLwater to make a 2mLaliquot to be given with each 100mLof blood exchanged in a term infant</p> <p>After every 100mL exchanged or as per calcium blood results.  Slow diluted bolus followed by blood aliquot.</p>
<b>Indication 4:</b> <b>Dilution</b> <b>Dosage</b> <b>Interval</b> <b>Administration</b>	<p><b>Acute hyperkalaemia</b> (serum potassium &gt;7mmol/L)</p> <p>Dilute 1:1 with water for injection</p> <p>0.5mL/kg (0.11mmol/kg) then dilute with the same volume of water for injection</p> <p>Repeat based on potassium and calcium results.</p> <p>IV infusion over 30 minutes. Stop if heart rate &lt; 100/min.</p>
<b>Compatible With</b>	<p>Dextrose 10%, dextrose 5%, sodium chloride 0.9%, lactated ringers,</p> <p>Y-site: Aciclovir, adrenaline, amikacin, aminophylline, amiodarone, atropine, cefazolin, cefotaxime, cefoxitin, ceftazidime, cefuroxime, chloramphenicol, ciprofloxacin, dexmedetomidine, digoxin, dopamine, dobutamine, doxapram, erythromycin, furosemide, ganciclovir, gentamicin, heparin, hydrocortisone, lidocaine, midazolam , milrinone, morphine, Penicillin G, phenobarbital, piperacillin+tazobactam, potassium chloride, propofol, ranitidine, sulfamethoxazole+trimethoprim, tobramycin, vancomycin.</p>
<b>Incompatible With</b>	<p>Amphotericin B, ceftriaxone, fluconazole, indomethacin, Lipid magnesium salts, meropenem, methylprednisolone, phenytoin, phosphates, sodium bicarbonate.</p> <p>Do NOT routinely infuse through the same line or Y site as TPN due to possible risk of precipitation with magnesium or phosphate salts Assess Y-site compatibility for fluid restricted infants or those with difficult iv access on an individualised basis.</p>

<b>Monitoring</b>	Ionised calcium. Check infusion site for extravasation and tubing for precipitates. Heart rate. Acid-base.										
<b>Stability</b>	Use ampoules once only and discard residual. Diluted solution is stable at room temperature for 24 hours.										
<b>Storage</b>	Room temperature. Do not use if precipitate present.										
<b>Adverse Reactions</b>	Local: tissue necrosis. Systemic: Rapid infusions may cause bradycardia / asystole.										
<b>Metabolism</b>	Renal excretion. 50% of calcium in blood is ionised; 40% bound to albumin; 10% complexed with bicarbonate, citrate, phosphate.										
<b>Comments</b>	No longer recommended in cardiac arrest <sup>3</sup> . If hypocalcaemic: correct low magnesium levels if present. Early hypocalcaemia is common in asphyxiated, preterm babies and infants of diabetic mothers: Treatment of asymptomatic infants is controversial. Hypocalcaemia common in exchange (citrated blood); alkalosis. Reports on compatibility of sodium bicarbonate with calcium gluconate are conflicting. Calcium must not be given within 48 hours of ceftriaxone										
<b>References</b>	<ol style="list-style-type: none"> <li>1. Shann F. "Drug Doses" Handbook 1998: Tenth Edition.</li> <li>2. "Neonatal Pharmacopoeia" Handbook 1998: 1<sup>st</sup> Edition.</li> <li>3. John Spence Nursery Drug Database web site <a href="http://www.cs.nsw.gov.au/rpa/neonatal/">http://www.cs.nsw.gov.au/rpa/neonatal/</a></li> <li>4. Neofax in Micromedexsolutions.com</li> <li>5. Comment in "Journal of Pediatrics" 1991 Jun; 118(6):994-5.</li> <li>6. <a href="http://www.micromedexsolutions.com">www.micromedexsolutions.com</a></li> <li>7. Starship Guideline Decmber 2018</li> <li>8. Calcium Gluconate Guideline The Royal Children's Hospital <a href="http://www.rch.org.au">www.rch.org.au</a></li> <li>9. Queensland Clinical Guidelines <a href="http://www.health.qld.gov.au/qcg">www.health.qld.gov.au/qcg</a></li> </ol>										
<b>Updated By</b>	<table> <tr> <td>Jan Klimek, Nicola Austin</td> <td>October 2001</td> </tr> <tr> <td>P Schmidt, B Robertshawe</td> <td>June 2005</td> </tr> <tr> <td>A Lynn, B Robertshawe</td> <td>July 2007</td> </tr> <tr> <td>A Lynn, B Robertshawe</td> <td>June 2012 (re-order profile)</td> </tr> <tr> <td>A Lynn, M Wallenstein, B Robertshawe</td> <td>August 2020 (review dosing)</td> </tr> </table>	Jan Klimek, Nicola Austin	October 2001	P Schmidt, B Robertshawe	June 2005	A Lynn, B Robertshawe	July 2007	A Lynn, B Robertshawe	June 2012 (re-order profile)	A Lynn, M Wallenstein, B Robertshawe	August 2020 (review dosing)
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