## **CALCIUM GLUCONATE**

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

	6 hourly as required
Dosage	IV infusion over 1-6 hours via central venous line
Interval	The slower infusion rate over 6 hours is preferred for safety
Administration	Maximum infusion rate 0.022 mmol/kg/min
Administration	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
	Example 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
Indication 3:	Exchange transfusion (counteract citrate, anticoagulant).
Dilution	Dilute 1:1 with water for injection.
Dosage	1mL(0.22mmol) diluted with 1mLwater to make a 2mLaliquot to be given with each 100mLof blood exchanged in a term infant
Interval	After every 100mL exchanged or as per calcium blood results.
Administration	Slow diluted bolus followed by blood aliquot.
Indication 4:	Acute hyperkalaemia (serum potassium >7mmol/L)
Dilution	Dilute 1:1 with water for injection (see dosing guide below)
Dosage	0.5mL/kg (0.11mmol/kg) then dilute with the same volume of water for injection
Interval	Repeat based on potassium and calcium results.
Interval Administration	Repeat based on potassium and calcium results. IV infusion over 30 minutes. Stop if heart rate < 100/min.
Interval Administration Compatible With	Repeat based on potassium and calcium results. IV infusion over 30 minutes. Stop if heart rate < 100/min. <b>Solutions:</b> dextrose 10%, dextrose 5%, sodium chloride 0.9%, lactated Ringer's

July 2024

Incompatible With	Amphotericin B, ceftriaxone, diazoxide, fluconazole, hydralazine, indometacin methylprednisolone, phenytoin, phosphates, sodium bicarbonate, sulfamethoxazole+trimethoprim.
	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.
Monitoring	Ionised calcium. Check infusion site for extravasation and tubing for precipitates. Heart rate. Acid-base.
Stability	Use ampoules once only and discard residual. Diluted solution is stable at room temperature for 24 hours.
Storage	Room temperature. Do not use if precipitate present.
Adverse Reactions	Local: tissue necrosis. Systemic: Rapid infusions may cause bradycardia / asystole.
Metabolism	Renal excretion. 50% of calcium in blood is ionised; 40% bound to albumin; 10% complexed with bicarbonate, citrate, phosphate.
Comments	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
References	<ol> <li>Shann F. "Drug Doses" Handbook 1998: Tenth Edition.</li> <li>"Neonatal Pharmacopoeia" Handbook 1998: 1<sup>st</sup> Edition.</li> <li>John Spence Nursery Drug Database web site http://www.cs.nsw.gov.au/rpa/neonatal/</li> <li>Neofax in Micromedexsolutions.com</li> <li>Comment in "Journal of Pediatrics" 1991 Jun; 118(6):994-5.</li> <li>www.micromedexsolutions.com</li> <li>Starship Guideline Decmber 2018</li> <li>Calcium Gluconate Guideline The Royal Children's Hospital www.rch.org.au</li> <li>Queensland Clinical Guidelines www.health.qld.gov.au/qcg</li> </ol>
Updated By	Jan Klimek, Nicola AustinOctober 2001P Schmidt, B RobertshaweJune 2005A Lynn, B RobertshaweJuly 2007A Lynn, B RobertshaweJune 2012 (re-order profile)A Lynn, M Wallenstein, B RobertshaweAugust 2020 (review dosing)A Lynn, B RobertshaweJune 2024 (routine review)

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