

# NICU: Calcium Gluconate

Reference No: CH PH N 33

Presentation:	Intravenous solution (10 ml ampoule of Calcium Gluconate 10%) 1 ml contains 0.225 mmol of elemental Ca <sup>2+</sup>	
Indications:	<ol style="list-style-type: none"> <li>1. Acute asymptomatic hypocalcaemia</li> <li>2. Symptomatic hypocalcaemia (i.e. seizures, tetany)</li> <li>3. Hyperkalaemia (prevention of arrhythmias)</li> <li>4. Cardiac arrest in presence of hyperkalaemia and/or hypocalcaemia</li> </ol>	
Dose:	For indications 1.2.3.4 as above - given as a single dose.	<p><b>Neonate:</b> 0.11 mmol/kg as a single dose* given over 5 – 10 minutes</p> <p>(*up to 0.5 mmol/kg may be used for the treatment of acute symptomatic hypocalcaemic e.g. convulsions)</p> <p>Plasma-calcium and ECG monitoring required for administration by slow IV injection (risk of arrhythmias if given too rapidly).</p>
	Acute hypocalcaemia (maintenance infusion) via SMART PUMP	<p><b>Neonate:</b> 0.5 mmol/kg daily over 24 hours</p> <p>(max rate 0.022 mmol/kg/hour), adjusted according to response</p>
Route of administration:	<ul style="list-style-type: none"> <li>- Central intravenous route is preferred due to risk of venous irritation/tissue damage/extravasation</li> <li>- If central venous access device is unavailable, dilute as below and administer via large peripheral vein, monitoring insertion site closely.</li> <li>- Use oral route as soon as possible due to risk of extravasation</li> </ul>	
Instructions for preparation and administration:	<p>Standard strength will be prepared by Pharmacy where possible. If required more quickly prepare as below:</p> <ul style="list-style-type: none"> <li>• Draw up 9ml of 10% calcium gluconate into a 50ml syringe</li> <li>• Make up to 50ml using glucose 5% or 10%</li> <li>• Syringe now contains 2.025 mmol calcium in 50ml i.e. 0.04mmol/ml</li> <li>• Volume required (ml) = <math>\frac{\text{dose (mmol/kg)} \times \text{weight (kg)}}{0.04}</math></li> </ul> <ul style="list-style-type: none"> <li>• Give as single dose over 5-10 minutes OR divide by 24 to work out maintenance hourly infusion rate</li> </ul> <p>It may be given more concentrated via a central line if necessary in an emergency or in fluid restricted patients (neat injection solution is used in some centres).</p>	

<p><u>Prescribing</u></p>	<p>For single dose prescribe as 'stat' dose to be given over 5-10 minutes on paper chart.</p> <p>Example maintenance infusion prescription for <b>0.8 kg</b> baby:</p> <table border="1" data-bbox="336 353 1544 555"> <tr> <td>Drug</td> <td>Calcium gluconate</td> <td>Drug amount in syringe</td> <td>Diluent</td> <td>Total volume (ml)</td> <td>Route</td> </tr> <tr> <td></td> <td>10% injection</td> <td>2.025mmol</td> <td>glucose 5%</td> <td>50ml</td> <td>IV</td> </tr> <tr> <td>Start date</td> <td>Drug concentration per ml</td> <td>Infusion range</td> <td>Min</td> <td>Max</td> <td>Name, Sig, Bleep</td> </tr> <tr> <td>22/5/19</td> <td>0.04mmol/ml</td> <td>Dose/kg/time</td> <td>0</td> <td>0.5mmol/kg/24hours</td> <td>A.Doctor</td> </tr> <tr> <td>Pharm</td> <td></td> <td>ml/hr</td> <td>0</td> <td>0.416</td> <td>#1234</td> </tr> </table>	Drug	Calcium gluconate	Drug amount in syringe	Diluent	Total volume (ml)	Route		10% injection	2.025mmol	glucose 5%	50ml	IV	Start date	Drug concentration per ml	Infusion range	Min	Max	Name, Sig, Bleep	22/5/19	0.04mmol/ml	Dose/kg/time	0	0.5mmol/kg/24hours	A.Doctor	Pharm		ml/hr	0	0.416	#1234
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<p>Directions for administration via SMART pump</p>	<ul style="list-style-type: none"> <li>• Load Syringe, prime line using the pump for accurate dosing.</li> <li>• Open 'NICU' folder then open 'Calcium Gluconate' programme.</li> <li>• Enter the baby's weight in kg</li> <li>• Enter loading dose in mmol/kg (zero if not required)</li> <li>• Confirm bolus time (To be given over minimum 10mins)</li> <li>• Enter the dose in <b>mmol/kg/24h</b></li> <li>• Visually confirm the rate (mls/h) against the prescribed dose (mmol/kg/24h)</li> <li>• Perform STOP moment with medical team (Pump against prescription)</li> <li>• Connect to Baby</li> <li>• Press start button</li> </ul>																														
<p>Known compatibility issues</p>	<p>NB: Ceftriaxone incompatibility: Calcium gluconate and ceftriaxone must not be mixed or administered simultaneously, even via different infusion lines, because of risk of precipitation. However, in patients &gt; 28 days, ceftriaxone and calcium gluconate may be administered sequentially, one after the other if infusion lines at different sites are used or if the infusion line is flushed thoroughly or replaced between infusions.</p>																														
<p>Additional Comments:</p>	<ul style="list-style-type: none"> <li>– Monitor ECG, BP and total calcium and ionised calcium levels closely</li> <li>– Higher maintenance doses may be required in some cases. This should be discussed with a consultant first</li> <li>– Adverse effects: administer slowly to minimise peripheral vasodilation, cardiac depression and circulatory collapse. Rapid IV administration may also cause hypotension, bradycardia, cardiac arrhythmia, nausea, vomiting, flushing and sweating.</li> </ul>																														

Note: The contents of this monograph should be read in conjunction with information available in the BNFC and Medusa

**References:**

British National Formulary for Children, accessed online via [www.medicinescomplete.com/](http://www.medicinescomplete.com/) on 4.11.19

Derby Hospitals NHS Foundation Trust, Calcium Gluconate: NICU: Paediatric Clinical Guideline, Version 3, Ref. No: CH PH N 33

Leeds Teaching Hospital NHS Trust Neonatal Unit Administration Guide Calcium Gluconate accessed via

<http://www.leedsformulary.nhs.uk/docs/NNU%20calcium%20gluconate%20monograph.pdf> on 4.11.19

Medusa Paediatric Intravenous Guide accessed via <http://medusa.wales.nhs.uk/IVGuideDisplay.asp> on 30.10.19

### Document control sheet

<b>GUIDELINE NUMBER</b>	CH PH N 33
<b>AREA IN WHICH THIS MONOGRAPH APPLIES</b>	NICU

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Divisional Clinical Governance Committee – Women & Children's	27/02/2020

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If review:

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Change history:

<b>Changes Reference</b>	<b>Change details</b>	<b>Date</b>
1	Separate NICU monograph written	October 2019