CALCIUM GLUCONATE

DESCRIPTION
Essential for the functional integrity of nervous, muscular, skeletal and cardiac systems and for clotting function. Hypocalcemia is common in asphyxiated infants, premature infants, infants of diabetic mothers, and following exchange transfusion. Signs suggestive of hypocalcemia in neonates include muscle twitching, jitteriness, generalised seizures or QTc above 0.40 seconds.

USE
Treatment and prevention of hypocalcaemia.

PHARMACOKINETICS
Well absorbed from the GI tract after oral administration. Rapidly incorporated into skeletal tissues with 99% of the body's calcium found in bone. Ionised calcium is the physiologically active fraction, accounting for 50% of total blood calcium. The remainder is bound to albumin (40%) or complexed with citrate, phosphate and bicarbonate (10%). Calcium chloride may be more bioavailable than calcium gluconate, but it also is more likely to cause metabolic acidosis.

PRESENTATION
9mg/ml Calcium Gluconate 10% ampoule with elemental calcium (0.22mmol/ml or 0.45mEq/ml). Can be used orally.

DOSE
The following dose are for 10% calcium gluconate injection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Pre-dilution dose</th>
<th>Route</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute symptomatic hypocalcaemia</td>
<td>1-2ml/kg</td>
<td>IV</td>
<td>6-8 hourly if necessary</td>
</tr>
<tr>
<td>Asymptomatic hypocalcaemia</td>
<td>1-2ml/kg</td>
<td>IV</td>
<td>6-8 hourly if necessary</td>
</tr>
<tr>
<td>Maintenance treatment</td>
<td>2-8ml/kg/day</td>
<td>IV PO</td>
<td>In 4 divided dose or</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>continuous infusion</td>
</tr>
<tr>
<td>Exchange transfusion</td>
<td>1ml/dose</td>
<td>IV</td>
<td>After every 100ml citrated</td>
</tr>
<tr>
<td></td>
<td>not per kilo!</td>
<td></td>
<td>blood exchanged</td>
</tr>
<tr>
<td>Rickets therapy*</td>
<td>17ml/kg/day</td>
<td>PO</td>
<td>In 4-6 divided dose with</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>feeds</td>
</tr>
</tbody>
</table>

*Preferable to use other oral preparations with higher concentration of elemental calcium.

ADMINISTRATION

IV
1. Doctors to write the pre-dilution dose in ml of 10% calcium gluconate on the medication chart.
2. Dilute 5ml of 10% calcium gluconate with 5ml of water for Injection to make a 1ml calcium gluconate in 2ml solution.
3. Then infuse double the prescribed volume slowly over 10-30 minutes using the proximal IV bung.
4. MONITOR for bradycardia and other arrhythmias. Stop infusion if heart rate is less than 100 beats per minute!

IF CONTINUOUS INFUSION IS ORDERED, THE MAXIMUM CONCENTRATION RANGE PERMITTED IS 10ML OF 10% CALCIUM GLUCONATE PER 100ML MAINTENANCE FLUID.

ORAL
Give oral dose with feeds.
CALCIUM-GLUCONATE cont

DISCARD
Discard unused portion.

MONITORING
Continuous cardio-respiratory monitoring. Observe IV site closely for extravasation. Avoid hypercalcemia during treatment. Correct hypermagnesemia if present.

ADVERSE EFFECT
1. Rapid administration is associated with bradycardia or cardiac standstill.
2. Cutaneous necrosis or calcium deposition with extravasation. See strategy for extravasation in NCC Procedure Manual.
3. Gastric irritation and diarrhoea may occur during oral therapy

COMPATIBLE FLUIDS
5%dextrose, 10%dextrose, 0.9%sodium chloride, amino acid

INCOMPATIBLE FLUIDS
lipid emulsion

TERMINAL INJECTION SITE COMPATIBILITY
amikacin, aminophylline, ampicillin, aztreonam, cefazolin, dobutamine, epinephrine, furosemide, heparin, hydrocortisone, meropenem, methicillin, midazolam, netilmicin, phenobarbital, propofol, tobramycin, vancomycin.

INCOMPATIBLE DRUGS
amphotericin B, clindamycin, cefotaxime, cephalothin, fluconazole, indomethacin, methylprednisolone, metoclopramide, sodium bicarbonate, and solutions containing carbonates, phosphates, or sulphates.

REFERENCE
Neonatal Formulary 5, Drug use in Pregnancy and First Year of Life, 2007, Blackwell Publishing Ltd