

# SODIUM BICARBONATE **This drug must be guardrailed**

<b>Trade Name</b>	Sodium bicarbonate 8.4% injection (Biomed)										
<b>Class</b>	Alkali										
<b>Mechanism of action</b>	Bicarbonate binds hydrogen ions then dissociates to form water + carbon dioxide .The net effect is to raise blood and urinary pH.										
<b>Indications</b>	<p><b>Indication 1:</b> Prolonged resuscitation ≥15 minutes</p> <p><b>Indication 2:</b> Correction of metabolic acidosis</p> <p><b>Indication 3:</b> Induction of metabolic alkalosis in PPHN</p> <p><b>Indication 4:</b> Renal tubular acidosis</p>										
<b>Contraindications</b>	Alkalosis, hypocalcaemia, inadequate ventilation Caution in renal impairment and hypernatraemia										
<b>Supplied As</b>	<b>Sodium Bicarbonate 8.4% solution (84mg/mL = 1mmol/mL)</b> <b>This ALWAYS needs to be diluted if given iv</b>										
<b>Dilution</b>	<p><b>IV:</b></p> <table border="1"> <thead> <tr> <th>8.4% Sodium Bicarbonate</th> <th>Water, 5% or 10% Glucose</th> <th>Total Volume</th> <th>Concentration now 4.2%</th> </tr> </thead> <tbody> <tr> <td>10mL (10mmol)</td> <td>10mL</td> <td>20mL</td> <td>0.5mmol/mL</td> </tr> </tbody> </table> <p><b>See separate infusion sheet for dosing and charting of a half correction for metabolic acidosis</b></p> <p><b>Oral:</b> Use the 8.4% injection solution, and there is no need to dilute it.</p>			8.4% Sodium Bicarbonate	Water, 5% or 10% Glucose	Total Volume	Concentration now 4.2%	10mL (10mmol)	10mL	20mL	0.5mmol/mL
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<b>Dosage / Interval / Administration</b>  <b>*Must chart guardrail and use Alaris pump*</b>	<p><b>Indication 1:</b> 1-2 mmol/kg (2-4 mL/kg of 4.2% solution) IV over 2 min and repeat at 10 minute intervals</p> <p><b>Indication 2:</b> Volume (mL) required for <b>half correction</b> is: <b>Base deficit x Wt (kg) x 0.3 = mL 4.2% soln.</b> <b>Use infusion sheet for correct charting</b></p> <p>IV over 1-4 hours. Repeat as required Rapid if associated with cardiac dysfunction / asphyxia, Slower for asymptomatic premature metabolic acidosis due to renal losses.</p> <p><b>Indication 3:</b> 6 - 12 mmol/kg/day iv infusion or oral replacement 8-12 hourly</p> <p><b>Indication 4:</b> Variable mmol/kg/day as required, iv infusion then oral replacement 8-12 hourly</p>										

<b>Guardrails ALARIS PUMP</b>	Concentration: 0.5mmol/mL Soft Alert Min: 0.1 mmol/kg/hr    Hard Alert Max: 6 mmol/kg/hr Soft Alert Max: 4 mmol/kg/hr    Default Setting: 2 mmol/kg/hr
<b>Guardrails TRANSPORT PUMP</b>	Concentration: 0.5mmol/mL Soft Alert Min: 0.1 mmol/hr    Hard Alert Max: 30 mmol/hr Soft Alert Max: 10 mmol/hr    Default Setting: 1 mmol/hr
<b>Compatible With</b>	<b>Solution:</b> Glucose 5%, 10%, sodium chloride 0.45%, 0.9%  <b>Terminal Y-site:</b> aciclovir, aminophylline, atropine, cefazolin, ceftazidime, clindamycin, dexamethasone, dexmedetomidine, digoxin, erythromycin, furosemide, hydrocortisone, gentamicin, glycopyrrolate, fluconazole, furosemide, heparin, indomethacin, insulin, magnesium sulphate, meropenem, metoclopramide, metronidazole, morphine, penicillin, phenobarbital, piperacillin/tazobactam, ranitidine, tobramycin, vancomycin, vasopressin.
<b>Incompatible With</b>	TPN, lipid, adrenaline, amphotericin, amiodarone, adrenaline, calcium chloride, calcium gluconate, cefotaxime, cefuroxime, chlorpromazine, diazepam, diazoxide, dobutamine, dopamine, imipenem/cilastatin, isoproterenol, methadone, midazolam, noradrenaline, pentamidine, phenytoin, sulphamethoxazole/trimethoprim
<b>Monitoring</b>	Response to resuscitation, blood gases, ensure adequate ventilation
<b>Stability</b>	Discard opened vial immediately after use Discard unused 4.2% (0.5mmol/L) reconstituted solution Use a new vial for each dose
<b>Storage</b>	Room temperature <30°
<b>Adverse Reactions</b>	<b>Systemic:</b> May temporarily increase $P_aCO_2$ and therefore reduce pulmonary artery blood flow. Increases sodium load leading to hypernatraemia especially in extreme premature in first few days of life. hypocalcaemia, hypokalaemia <b>Cerebral:</b> Rapid administration is associated with IVH. <b>Local:</b> Venous irritation, local tissue necrosis in extravasation due to osmolarity
<b>Metabolism</b>	Converted to bicarbonate ( $H_2CO_3$ ) then water ( $H_2O$ ) and carbon dioxide ( $CO_2$ ).
<b>Comments</b>	Hyperosmolar – 1800 mOsmol/kg $H_2O$ . Bicarbonate is irritant to veins, so preferred administration is via UVC or long line. If given in context of inadequate ventilation bicarbonate increases $P_aCO_2$ and decreases pH, therefore it should only be used once adequate ventilation is established. Avoid rapid bolus

<b>References</b>	<ol style="list-style-type: none"> <li>1. Neofax, Young T E, Mangum B, Acorn, Raleigh, 2000</li> <li>2. Manual of Neonatal Care, Cloherty J C, Stark A R, eds. Lippincott-Raven, Philadelphia, 1998</li> <li>3. Micromedex <a href="http://www.micromedexsolutions.com">www.micromedexsolutions.com</a></li> </ol>																
<b>Updated By</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">N Austin, K Simonsen</td> <td>April 02, Oct 02</td> </tr> <tr> <td>P Schmidt, B Robertshawe, C Muir</td> <td>December 2005</td> </tr> <tr> <td>A Lynn, B Robertshawe, F Robertson</td> <td>July 2009, Sept. 2009</td> </tr> <tr> <td>A Lynn, B Robertshawe</td> <td>Nov 2011 (mmol/kg/hr guardrail unit)</td> </tr> <tr> <td>A Lynn, B Robertshawe</td> <td>Nov 2012 (re-order profile, discard vial)</td> </tr> <tr> <td>A Lynn</td> <td>May 2013 (decrease soft min after audit)</td> </tr> <tr> <td>A Lynn B Robertshawe</td> <td>March 2017 (incompatibility data)</td> </tr> <tr> <td>A Lynn B Robertshawe</td> <td>February 2022 (routine review)</td> </tr> </table>	N Austin, K Simonsen	April 02, Oct 02	P Schmidt, B Robertshawe, C Muir	December 2005	A Lynn, B Robertshawe, F Robertson	July 2009, Sept. 2009	A Lynn, B Robertshawe	Nov 2011 (mmol/kg/hr guardrail unit)	A Lynn, B Robertshawe	Nov 2012 (re-order profile, discard vial)	A Lynn	May 2013 (decrease soft min after audit)	A Lynn B Robertshawe	March 2017 (incompatibility data)	A Lynn B Robertshawe	February 2022 (routine review)
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