

Paediatrics: Sodium Bicarbonate

Presentation:	Injection 8.4% (1mmol of bicarbonate/ml), 10ml ampoule				
Indication:	Used to correct severe metabolic acidosis				
Dose:	<p>The amount of alkali required to half-correct the acidosis depends on the age of the child and the base deficit and can be calculated using the following formulae:</p> <p>Pre-term neonate – see NICU monograph</p> <p>Term neonate $\text{mmol alkali (bicarbonate)} = \frac{\text{base deficit (mmol/L)} \times \text{body weight (kg)} \times \mathbf{0.4}}{2}$</p> <p>Child > 1 month $\text{mmol alkali (bicarbonate)} = \frac{\text{base deficit (mmol/L)} \times \text{body weight (kg)} \times \mathbf{0.3}}{2}$</p> <p>A half-correction is given initially and is usually sufficient. It may be repeated if clinically appropriate.</p>				
Route of administration:	<p>Intravenous infusion – ideally via central line however may be given peripherally for emergency correction (see table below for concentrations).</p> <p>However, exercise extreme caution and monitor infusion site closely as Sodium bicarbonate is highly irritant. Venous damage and thrombophlebitis may occur at the site of infusion. Extravasation can result in severe tissue damage with necrosis, sloughing or ulceration.</p>				
Instructions for preparation and administration:	<p>** Use a ready-to-use preparation of the required concentration if available **</p> <p>Water for injection, glucose 5%, glucose 10% and sodium chloride 0.9% are suitable diluents if required. Note sodium chloride 0.9% provides additional sodium and should be avoided in renal impairment due to risk of hypernatraemia.</p> <p>Diluting 8.4% sodium bicarbonate solution for central infusion: Dilute each 1mL to 5mL. E.g. Draw up 10mL (10mmol) of sodium bicarbonate 8.4% and dilute to 50mL, to obtain a 0.2mmol/mL (10mmol in 50mL) solution.</p> <p>Diluting 8.4% sodium bicarbonate solution for peripheral infusion: Dilute each 1mL to 10mL. E.g. Draw up 5mL sodium bicarbonate 8.4% and dilute to 50mL, to obtain a 0.1mmol/mL (5mmol in 50mL) solution.</p> <p>In non-emergencies, concentrations over 1.4% should be given via a central venous access device but in emergencies, the maximum concentrations below may be given peripherally:</p> <table border="1" data-bbox="327 1776 1519 1854"> <thead> <tr> <th>Infants under 2 years</th> <th>Infants of 2 years or greater</th> </tr> </thead> <tbody> <tr> <td>4.2% solution</td> <td>8.4% solution</td> </tr> </tbody> </table> <p>Infuse over at least 20 minutes (preferably 1 – 2 hours) (maximum infusion rate = 0.5mmol/kg/minute of bicarbonate).</p>	Infants under 2 years	Infants of 2 years or greater	4.2% solution	8.4% solution
Infants under 2 years	Infants of 2 years or greater				
4.2% solution	8.4% solution				
Prescribing	<p><u>QHB</u>- Prescribe on Meditech <u>RDH</u>- Prescribe on paper chart Paper drug chart in accordance with Trust Medicines Code</p>				

Directions for SMART pump	<p>The program for Sodium Bicarbonate is found in the NICU folders</p> <ul style="list-style-type: none"> • Load Syringe, prime line using the pump for accurate dosing • Open 'NICU' folder then open 'Sodium Bicarbonate' programme. • Using DATA chevrons enter the total VTBI in mls and confirm • Enter the Total Time to infuse in hours and minutes then confirm • Visually confirm the rate (ml/h) • Perform STOP moment with medical team (Pump against prescription) • Connect to Child • Press start button
Known compatibility issues	See separate compatibility chart
Additional Comments:	<p>Monitor: infusion site for signs of tissue damage, blood gases, U&Es for sodium and potassium levels.</p> <p>Hypernatraemia – each ml of sodium bicarbonate 8.4% contains 1mmol of sodium, this may be significant if plasma sodium is already raised. If high sodium or bicarbonate levels are a problem, consider the use of THAM (trometamol) as an alternative agent to correct acidosis.</p> <p>Hypochloraemic alkalosis may occur if used in conjunction with potassium-depleting diuretics e.g. furosemide and thiazide diuretics.</p>

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

References:

British National Formulary. Accessed by www.medicinescomplete.com (last accessed 25/12/2023)

Injectable Medicines Guide. Accessed by <http://medusa.wales.nhs.uk/IVGuideDisplay.asp> (last accessed 125/12/2023)

Handbook on Injectable Drugs. Accessed by www.medicinescomplete.com (last accessed 25/12/2023)

Evelina London, Paediatric Formulary, accessed at <http://cms.ubqo.com/public/d2595446-ce3c-47ff-9dcc-63167d9f4b80> (last accessed 25/12/2023)

Nottingham Children's Hospital Sodium Bicarbonate monograph. Accessed at [Results of search for 'sodium bicarbonate' > NUHT Clinical Guidelines and Policies catalogue \(koha-ptfs.co.uk\)](#) on 25/12/2023

Neonatal Formulary, Sean Ainsworth. Eighth Edition. (2020) Accessed: 25/12/23

Document control sheet

GUIDELINE NUMBER	
AREA IN WHICH THIS MONOGRAPH APPLIES	Paeds/NICU

DIVISIONAL AUTHORISATION	
GROUP	DATE
Paediatric monograph review group	27/12/23

AUTHORS		
Author	Position	Date
Written by: Lisa Taylor	Paediatric Pharmacist	May 2017
Checked by: Kevin Inglesant	Paediatric Pharmacist	May 2017

If review:

Author	Position	Date
Updated and transferred to new template by: Zarka Bibi	Rotational Clinical Pharmacist	13/01/2020
Reviewed by:	Harriet Hughes, Advanced Pharmacist, Women's & Children's	20/02/2020
Checked by:	Lamia Ahmed, Advanced Pharmacist- Women's and Children's	24/12/23

Change history:

Changes Reference	Change details	Date
1	Pre-term neonate dosing removed by Naomi Gladwell (Specialist Pharmacist, Women's & Children's) - new NICU monograph	02/07/20
2	Prescribing instructions for QHB and RDH added	December 2023