University Hospitals of Derby and Burton NHS Foundation Trust

NICU: Sodium Bicarbonate

Presentation:	Injection 8.4% (1mmol of bicarbonate/ml), 10ml ampoule
Indication:	Used to correct severe metabolic acidosis
Dose:	The amount of alkali required to **half-correct** the acidosis depends on the gestational age of the baby and base deficit and can be calculated using the following formulae: **Pre-term neonate (< 37 weeks gestation)** mmol alkali (bicarbonate) = base deficit (mmol/L) x body weight (kg) x **0.6** / **2** **Term neonate (≥ 37 weeks gestation)** mmol alkali (bicarbonate) = base deficit (mmol/L) x body weight (kg) x **0.4** / **2** **Child > 1 month** See paediatric monograph A **half-correction** is given initially and is usually sufficient. It may be repeated if clinically appropriate.
Route of administration:	Intravenous infusion – ideally via central line however may be given peripherally for emergency correction **(see table below for concentrations).** 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.
Instructions for preparation and administration:	** Use a ready-to-use preparation of the required concentration if available ** 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. In non-emergencies, concentrations over 1.4% should be given via a **central venous access** device but in emergencies, or in fluid restricted babies where a central line is not available, a **maximum concentration of 4.2% solution** may be given peripherally, however a lower concentration should be used where at all possible: **In emergencies infuse over 20-30 minutes** **In non-emergencies infuse over 1-2 hours (Maximum rate of administration 1mmol/kg/hr)**

Starting Strength	Preparation	End solution	Once diluted, Suitable for:
8.4%	*Draw up 10mL (10mmol) of sodium bicarbonate 8.4% and dilute **to** 20mL, to obtain a 0.5mmol/mL (10mmol in 20mL) solution. Discard overage.*	**4.2%**	**Central** (and peripheral in emergency only)
8.4%	Draw *up 5mL (5mmol) of sodium bicarbonate 8.4% and dilute to 30mL, to obtain a 0.17mmol/mL (5mmol in 30mL) solution. Discard overage.*	**1.4%**	**Peripheral** & **Central**
1.26%	Available in pharmacy as a pre-made 500mL polyfusor (contains 0.15mmol/mL)	**1.26%**	**Peripheral** & **Central**

Flush with sodium chloride 0.9%

Prescribing	QHB: Prescribe on MediTech RDH: Prescribe on NICU paper chart

Instructions for SMART pumps:	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 Baby • Press start button
Known compatibility issues	Sodium bicarbonate should not be infused via the same line as any other infusion, in particular calcium and magnesium salts including TPN
Additional Comments:	Monitor: infusion site for signs of tissue damage, blood gases, U&Es for sodium and potassium levels. **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. **Hypochloraemic alkalosis** may occur if used in conjunction with potassium-depleting diuretics e.g. furosemide and thiazide diuretics.

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

References:

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Leeds Teaching Hospitals Paediatric Administration Guide Intravenous Sodium Bicarbonate. Accessed at http://www.leedsformulary.nhs.uk/docs/PaedSodiumBicarbonateMonograph.pdf (last accessed 08/04/2024)

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Document control sheet

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AREA IN WHICH THIS MONOGRAPH APPLIES	NICU

DIVISIONAL AUTHORISATION	
GROUP	**DATE**
Paediatric monograph review group	August 2024

AUTHORS		
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If review:

	Position	Date
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Change history:

Changes Reference	Change details	Date
	Monograph split from paediatrics	02/07/20
	Addition of prescribing instructions for QHB and RDH. Addition of flush instructions. Addition of instructions to not administer via the same line as any other drug.	March 2024
	Removal of THAM as not stocked at RDH, administration instructions written more clearly for emergencies and non-emergencies	