Clinical Guidance

Intravenous Sodium Bicarbonate Guideline.

Summary

This guideline has been created to provide correction of acidosis and renal acidosis in neonates and children in non-cardiac arrest scenarios. It also advises dosing in hyperkalemia as well as appropriate dilution in both peripheral and central/intraosseous routes of administration.

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This clinical Pathway was produced by NECTAR hosted by Newcastle Upon Tyne Hospital Trust. To be used by nurses, doctors, ACCPs and ambulance staff to refer to in the emergency care of critically ill children. This guideline represents the views of NECTAR and was produced after careful consideration of available evidence in conjunction with clinical expertise and experience. The guideline does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.	

Change History		
Date	**Change history Details**	**Approved By**

IV Sodium Bicarbonate Guideline

Reference Range:

Neonate 19-28mmol/L, Child 19-28mmol/L, Adult 22-29mmol/L

Dose:

Correction of acidosis in <u>non-</u>cardiorespiratory arrest patients

Half correction (mmol bicarbonate) = F x base deficit (mmol/L) x weight (kg)x 0.5

Full correction (mmol bicarbonate) = F x base deficit(mmol/L) x weight (kg)

F = 0.3 for infants and children

F = 0.4 for neonates

F = 0.6 for premature neonates

Note: Give half correction dose initially.

Blood glucose, electrolytes and PH should be analysed before correction

Renal Acidosis

All ages 1-2mmol/kg/day in divided doses – oral is preferred route

Hyperkalaemia

1-2mmol/kg as single dose – see Hyperkalaemia Guideline

Products:

Sodium bicarbonate polyfusor 1.26% 500ml (0.15mmol/ml of bicarbonate)

Sodium Bicarbonate 8.4% 100ml vial (1mmol/ml bicarbonate)

Sodium Bicarbonate 4.2% 100ml vial (0.5mmol/ml bicarbonate)

Administration

Slow IV infusion over 1-2 hours. Can be given over 30 minutes if urgent

I.e. hyperkalaemia.

	1.26% polyfusor (0.15mmol/ml bicarbonate)	**4.2% vial (0.5mmol/ml bicarbonate)**	**8.4% vial (1mmol/ml bicarbonate)**
Peripheral IV infusion	Undiluted use	Dilute each ml from vial to 5mls fluid to achieve 1mmol/10ml solution For example: For 5mmol of sodium bicarbonate. Draw up 10mL (5mmol) sodium bicarbonate 4.2% and dilute with 40mL to a final volume of 50mL	Dilute each ml from vial to 10mls fluid to achieve a 1mmol/10mls solution For example: For 5mmol of sodium bicarbonate. Draw up 5mL (5mmol) sodium bicarbonate 8.4% and dilute with 45mL to a final volume of 50mL
Central IV or IO infusion	Undiluted use	Dilute each ml from vial to 2.5mls fluid to achieve 1mmol/5mls solution. For example For 10mmol of sodium bicarbonate Draw up 20mL (10mmol) of sodium bicarbonate 4.2% and dilute with 30mL to a final volume of 50mL	Dilute each ml from vial to 5mls fluid to achieve 1mmol/5mls solution. For example For 10mmol of sodium bicarbonate Draw up 10mL (10mmol) of sodium bicarbonate 8.4% and dilute with 40mL to a final volume of 50mL
Diluents: 5% glucose , 10% glucose and 0.9% sodium chloride (except in renal impairment patients)			

Extravasation can cause severe tissue damage and sites must be monitored carefully.

Cautions:

Should not be infused in same line as other infusions

Incompatible with calcium, magnesium and phosphate infusion

Side effects:

Hypernatremia (1000ml 4.2% $NaHCO_3$ contains 500mmol Na, compared with 1l 0.9% normal saline which contains 155mmol Na), Hypochloraemia, hypokalaemia and low ionized calcium

Hypoventilation

References:

Guys and St Thomas NHS Foundation Trust. Paediatric formulary. Sodium bicarbonate Monograph. August 2024. Accessed online Jan 2025.

Medusa paediatric IV guide. Sodium bicarbonate monograph v8. Accessed online via: Injectable Medicines Guide - Display - Sodium bicarbonate - Intravenous - Version 8 - IVGuideDisplayMain.asp