MONOGRAPH

Sodium Bicarbonate

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	All Clinical Areas

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this DISCLAIMER

⚠ HIGH RISK MEDICINE ⚠

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring

DRUG CLASS

Electrolyte.[1]

Sodium bicarbonate is a High Risk Medicine.

INDICATIONS AND RESTRICTIONS

- Acute metabolic acidosis.[2]
- Hyperkalaemia.[3]
- Chronic acidosis (e.g. renal tubular acidosis, chronic kidney disease).[4]
- Cardiac arrest (prolonged, or in presence of hyperkalaemia or sodium channel blocker toxicity).[2]
- Ventricular dysrhythmias due to tricyclic antidepressant poisoning.[3]

CONTRAINDICATIONS [3, 4]

- Hypersensitivity to sodium bicarbonate or any component of the formulation.
- Metabolic or respiratory alkalosis.

PRECAUTIONS [2, 3]

- Pre-existing respiratory acidosis – may worsen hypercapnia.
- Pre-existing hypernatraemia, hypocalcaemia or hypokalaemia.
- Salt-losing nephropathy – increased risk of milk-alkali syndrome.
- Congestive heart failure.

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- Sodium bicarbonate 8.4% 1 mmol/mL (84 mg/mL) oral liquid.
- Sodium bicarbonate 10 mmol (840 mg) oral capsule.
- Sodium bicarbonate 8.4% 1 mmol/mL (84 mg/mL) vial.

Imprest location: Formulary One

DOSAGE & ADMINISTRATION, DOSAGE ADJUSTMENTS

- ***For oncology indications, refer to Children's Oncology Group (COG) or other oncology specific treatment protocols relevant to the patient.***
- **Intravenous use in patients that are admitted under the nephrology team should always be discussed with a nephrologist.**

Sodium bicarbonate administration may cause hypokalaemia and hypocalcaemia. Monitor potassium and calcium levels closely and consider supplementation if indicated. See monitoring section.

INTRAVENOUS (All ages)

Routine administration in cardiac arrest is not recommended. May be considered in certain cases (e.g. prolonged cardiac arrest, presence of hyperkalaemia or sodium channel blocker toxicity).[2]

- Extravasation may result in severe tissue damage. Monitor infusion site closely.[5]
- Administration via Central Venous Access Device **(CVAD)** is preferred.[6]
- If peripheral administration is necessary, administer into a large peripheral vein.[6]

Intermittent IV infusion:

- ≥ 4 weeks: 1 mmol/kg/dose (maximum 50 mmol).[2]
  - Repeat doses between 0.5 – 1 mmol/kg may be indicated, guided by individual patient's acid-base balance.[2]
- Higher doses of up to 2 mmol/kg/dose (maximum 100 mmol) may be indicated for treatment of salicylate or sodium channel blocker toxicity.[3, 10]
  - Repeat doses should be guided by individual patient's acid-base balance[2]
  - Maximum cumulative dose: 6 mmol/kg (maximum 600 mmol)[10]
  - Seek urgent clinical toxicology advice if not responding to maximum dose[10]

Administration

- Non-urgent correction:
  - Dilute to 0.2 mmol/mL (CVAD administration) or 0.1 mmol/mL (peripheral administration).
  - ≥ 4 weeks: Give over 4 - 8 hours, to reduce the risk of intracranial haemorrhage. [1, 5, 6]
    - Maximum infusion rate: 1 mmol/kg/hour[1, 5, 6]
- IV administration in emergency situations:
  - Preferably infuse over 30 minutes (maximum rate 10 mmol/minute)[5, 6]
  - May be administered as an IV injection over 1 – 2 minutes in life-threatening situations under the direction of a consultant.[11]
  - Patients < 2 years – Dilute to 0.5 mmol/mL.[5, 6]
  - Patients 2 years and above – May be administered undiluted[5, 6]

Continuous IV infusion:

- Initially 0.1 – 1 mmol/kg/hour, titrate to target acid-base balance.[8]
- Start at lower rate if intermittent (stat dose) IV infusion has been given prior to commencing.

Dilution:

Standard (CVAD or peripheral)	10 mmol in 100 mL (0.1 mmol/mL) *Administer using large volume pump.*
Fluid restricted (CVAD only)	50 mmol in 50 mL (1 mmol/mL undiluted) *Administer using syringe driver.*

Renal impairment: Monitor for sodium retention.[2]

Hepatic impairment: Use with caution, particularly in presence of oedema or sodium retention.[2]

ENTERAL

Refer to Clinical Pharmacology for indication specific dosing.

Sodium bicarbonate may significantly affect absorption, elimination or stability of certain medications (e.g. flecainide, itraconazole). Refer to PCH approved references or contact a pharmacist for advice.

COMPATIBILITY *(LIST IS NOT EXHAUSTIVE)*

Compatible fluids:

Glucose 5% (preferred diluent*), glucose 10%, sodium chloride 0.9%, glucose in sodium chloride solution, sodium chloride 0.45%.[5]

**Dilution with sodium chloride 0.9% increases sodium concentration.*

Compatible at Y-site:

Aciclovir, cefazolin, ceftaroline, ceftazidime, ceftriaxone, ciclosporin, clindamycin, dexamethasone, esmolol, fentanyl, fluconazole, furosemide, heparin sodium, hydrocortisone sodium succinate, methylprednisolone sodium succinate.[5]

Only commonly used drugs are listed below. This is not a complete list of incompatible drugs. Compatibilities of IV drugs must be checked when two or more drugs are given concurrently.

INCOMPATIBLE drugs:

Calcium or magnesium containing solutions/drugs (including Hartmann's or Ringer's solution), adrenaline, amiodarone, amoxicillin, atracurium, caspofungin, dobutamine, dopamine, hydromorphone, isoprenaline, ketamine, labetalol, midazolam, noradrenaline, ondansetron, promethazine, suxamethonium, vancomycin.[5]

MONITORING

- Continuous ECG monitoring[9] must be performed in patients receiving IV sodium bicarbonate infusion for correction of metabolic acidosis in presence or at high risk of other electrolyte disturbances (e.g. in patients with renal tubular acidosis).[8]
- Serial ECGs should be performed until ECG abnormalities are stabilised.
- Acid-base balance, electrolytes (bicarbonate, sodium, potassium and calcium)[4,6] – monitoring intervals to be determined by the treating team depending on individual patient factors.

ADVERSE EFFECTS

Hypernatraemia, hypokalaemia, fluid retention/overload, metabolic alkalosis.[3]

INTERACTIONS

This medication may interact with other medications; consult PCH approved references (e.g. Clinical Pharmacology), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

Please note: The information contained in this guideline is to assist with the preparation and administration of **sodium bicarbonate**. Any variations to the doses recommended should be clarified with the prescriber prior to administration

References

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