Sodium bicarbonate Intravenous for Adults

Who can administer

May be administered by registered competent doctor or nurse/midwife

Important information

- Any reference to **mmol** refers to both sodium and bicarbonate
- Equivalencies: **1mmol is equivalent to 1mEq bicarbonate**
- **Except in emergencies,** the 8.4% infusion **MUST** be given via a central line
- See **monitoring requirements** overleaf
- Significant **sodium** content (1mmol per mL)

Available preparations

Sodium bicarbonate 1.26% 75mmol (mEq) per 500mL infusion (Braun polyfusor) (intermittent supply issues- see under Further information below re preparation of this solution using higher strength infusion)

Sodium bicarbonate 8.4% 100mmol(mEq) per 100mL infusion (Braun)

Sodium bicarbonate 8.4% in 10mmol (mEq) per 10mL (Martindale) (unlicensed)

Reconstitution

Already in solution

Infusion fluids

- Not required (product ready for use as is)
- If required the 8.4% infusion may be further diluted with Glucose 5% - see under further information

Methods of intravenous administration

Slow intravenous injection

- In emergency situations can give (8.4%) over at least 3 minutes (ref 1)

Intermittent intravenous infusion (administer using an electronically controlled infusion device)

- **Peripheral line** - **use 1.26%** strength
- **Central line** - use any strength up to 8.4%
- See under 'Dose' below for more detail

Maximum infusion rates (ref 1):

- Maximum infusion 1.5**mmol/kg/hour** is equivalent to the following infusion rates for different concentrations:
    - **Central venous access device**: 1.5mL/kg/hour of a 8.4% solution
    - **Peripheral venous access device**: 10mL/kg/hour of a 1.26% solution

Dose in adults

Cardiac arrest

- Routine use is **not recommended** but see specialist guidelines

Metabolic acidosis

- **Seek specialist advice regarding dosage**
- Correction of metabolic acidosis should not be effected too rapidly
- It is advisable to start administering only half of the calculated dose and adjust further doses according to the actual results of blood gas analysis.
- The dose depends on the degree of the disorder of the acid-base status
- According to the blood gas values the amount to be administered is calculated applying the following formula:
  - mmol sodium bicarbonate = base deficit x kg body weight x 0.2**
  - **(The factor 0.2 corresponds to the proportion of the extracellular fluid in relation to total body weight.)
- Example:
  - If in a patient of 70 kg bodyweight the base deficit is 5 mmol/l, then
  - 5 x 70 x 0.23 = 70mmol of sodium bicarbonate (70 ml of 8.4 % w/v Sodium Bicarbonate Intravenous Infusion BP)are to be given.
- Subsequent doses should be adjusted to patient's requirements

Tumour lysis syndrome [ref 3]

- The EVIQ cancer treatment guidelines state that sodium bicarbonate is not recommended due to a lack of clear evidence demonstrating benefit
- Urinary alkanisation should **be avoided** in patients with tumour lysis syndrome especially when rasburicase is available

Prevention of contrast-induced nephropathy (unlicensed use):

- **Using the 1.26% polyfusor** give 3ml/kg for ONE hour immediately before contrast, then 1ml/kg/hour during procedure and for SIX hours after procedure [ref 2]

Monitoring

- Monitor pH, serum bicarbonate, and arterial blood gases [ref 1]
- Frequent monitoring of serum electrolyte concentrations and acid-base status is essential during treatment
- Watch for consequences of sodium load
- Monitor for extravasation

Further information

- Concentrations over 1.4% should ideally be given via a central venous access device but in emergencies, may be given via a peripheral venous access device [ref 1]
  - Hypertonic solution (greater than 1.4%) may cause venous irritation, and extravasation may lead to severe tissue damage [ref 1]
- Accidental paravenous administration may lead to tissue necrosis
- Additions of other drugs **should never be made** to sodium bicarbonate infusions, particularly calcium and magnesium salts [ref 1]

Dilution of Sodium bicarbonate (8.4%) infusion

- As Sodium bicarbonate 8.4% has a very high osmolarity and ideally should only be given via a central line, it may occasionally be necessary to dilute this strength.
- However, it is preferable to use a premade infusion bag containing 1.26% sodium bicarbonate.
- If the pre-mixed polyfusor 1.26% is not available, a **1.26% concentration** may be prepared as follows:
- Remove 75ml from Glucose 5% 500ml bag, add 75ml of Sodium bicarbonate 8.4% to the remaining 425ml in the bag.
- Mix well by inverting the bag several times
- While it is possible to use Sodium chloride 0.9% or 0.45% to prepare the 1.26% concentration, this is generally not done due to the increased sodium load.

Storage

- Store below 25^{0}C
- Do not refrigerate

References

SPC 8.4% August 2017

1. Injectable medicines administration guide Medusa, downloaded 4th March 2025

2. Uptodate - accessed online 4th March 2025

3. EVIQ guidelines: Prevention and management of Tumour Lysis Syndrome 25th May 2018

Therapeutic classification

Electrolyte