

Class

Alkalizing Agent, Systemic Hydrogen Ion Buffer

Pharmacologic Properties

Sodium bicarbonate is an endogenous anion that reacts with hydrogen ions to form water and carbon dioxide. It is an alkalizing agent used to buffer acids present in the body during periods of metabolic acidosis. Its effect is to raise the serum pH. This effect is favorable in the treatment of pre-existing metabolic acidosis, hyperkalemia, tricyclic anti-depressant/salicylate (aspirin)/or phenobarbital overdose, and after profound hypoxia/prolonged cardiac arrest. Sodium bicarbonate is effective only when administered with adequate ventilation and oxygenation.

Indications

- Bicarbonate responsive metabolic acidosis precipitating cardiac arrest [Protocol 9, Protocol 9P](#).
- Hyperkalemia [Protocol 9, Protocol 9P](#).
- Tricyclic antidepressant [Protocol 15, Protocol 15P](#).
- Adult traumatic injuries causing asphyxiation or crush syndromes [Protocol 21](#).

Contraindications

- Congestive heart failure
- Alkalotic states
- Hypoxic lactic acidosis

Precautions

- Excessive bicarbonate therapy inhibits the release of oxygen, induces hyperosmolarity and hypernatremia, and produces paradoxical acidosis in myocardial and cerebral cells
- Bicarbonate does not improve the ability to defibrillate
- May inactivate simultaneously administered catecholamines
- Will precipitate if mixed with calcium chloride

Side Effects/Adverse Reactions

- Metabolic alkalosis
- Hypernatremia/Hyperosmolality
- Cerebral acidosis (paradoxical effect)
- Sodium and fluid retention which can cause pulmonary edema

Dosage and Administration**Adult**Adult Cardiac Arrest/Overdose/Hyperkalemia (8.4% Solution)

- 1 mEq/kg slow IV/IO
 - May repeat in 10 minutes, 0.5 mEq/kg.

Adult Reperfusion (Crush) Injury

- 1 mEq/kg IV/IO mixed into a 1000 mL bag of NS with a 10 gtt (macro) drip set and infused wide open.

Adult Traumatic Asphyxia (8.4% Solution)

- 1 mEq/kg slow IV/IO just prior to or during the removal of the entrapment.
 - Administration during compressed chest injuries for a prolonged period of time > 20 minutes.

PediatricPediatric Cardiac Arrest/Overdose/Hyperkalemia (8.4% Solution)

- 1 mEq/kg slow IV/IO
 - May repeat in 10 minutes, 0.5 mEq/kg.

Infant/Neonate (4.2 % Solution)

- 1 mEq/kg slow IV/IO
 - Dilute 8.4% to 4.2% by discarding 25 mL of vial and drawing up 25 mL of NS to mix into vial yielding a 1:1 ration in concentration = 4.2%