



## **Drug Shortage Alert**

We have recently been made aware of an unexpected backorder of Intravenous (IV) sodium bicarbonate vials. They are on a North American back order as well as a recall. The syringes have been placed on emergency release only. The syringes and vials have previously and sporadically been affected by shortages.

- **Sodium Bicarbonate Injection USP (8.4% - 1 mEq/mL) in the 25 X 50 mL vial format** produced by Pfizer is anticipated to be unavailable for many months.

The minimal available stock of pre-filled syringes remains on emergency allocation (50% volume of vials and syringes for our region ordered in 2016) until at least August 2017.

- Sodium Bicarbonate 4.2% 10 mL PFS (LifeShield™)
- Sodium Bicarbonate 7.5% 10 mL PFS (LifeShield™)
- Sodium Bicarbonate 8.4% 10 mL PFS (LifeShield™)
- Sodium Bicarbonate 8.4% 50 mL PFS (LifeShield™)

## **Implications for Patient Care**

- Sodium bicarbonate injection is commonly used in critical care settings during advanced cardiac life support (ACLS). The product is also used to manage metabolic acidosis and hyperkalemia and to increase urinary pH. Sodium bicarbonate injection may be used as an antidote for selected products such as tricyclic antidepressants, methyl alcohol, phenobarbital, or salicylates.
- It can be used to prepare extemporaneous oral solutions of omeprazole or lansoprazole

## Alternative Agents & Management Strategies

- This is a brief summary developed by the American Society of Critical Care Medicine (SCCM) Drug Shortages Task Force of common uses of IV sodium bicarbonate in the ICU, and suggested management strategies.

The recommendations provided are based on a combination of the current evidence as well as the need for conservation during this shortage.

Select Indications in the Critically Ill	Recommendation	Key Points
Prevention of contrast-induced nephropathy in those at risk	0.9% sodium chloride 1 mL/kg/hr for 6–12 hrs pre- and 6–12 hrs post-procedure For emergent procedures: 0.9% sodium chloride 3mL/kg bolus, followed by 1 mL/kg/hr for 6–12 hrs post-procedure	Use of sodium bicarbonate is associated with mixed results; studies have differing therapeutic end points. Identify patients at high risk and minimize modifiable risks (concomitant nephrotoxins, etc.). Use iso-osmolar, non-ionic contrast where possible.
Urinary alkalization to enhance drug elimination	Optimal alternatives will be agent-specific (see text for details)	Evidence to support use of sodium bicarbonate is limited for most agents, with the best data in relation to enhancing elimination of high-dose methotrexate.
Rhabdomyolysis (see Urinary Alkalization in previous row)	Aggressive resuscitation with 0.9% sodium chloride	Sodium bicarbonate offers no significant improvement over aggressive fluid resuscitation with 0.9% sodium chloride.
Hyperkalemia (acute management)	Insulin, 10 units IV push with 50% dextrose, 50 mL +/- inhaled beta-2 agonists	Sodium bicarbonate therapy has little use in the routine treatment of hyperkalemia unless severe metabolic acidosis is present.
Sepsis-induced acidosis	Sodium bicarbonate not recommended in patients with pH greater than 7.15	Studies do not support that sodium bicarbonate enhances catecholamine effectiveness. Treat underlying shock/source of acidemia
Diabetic Ketoacidosis	Sodium bicarbonate not recommended	Treat underlying ketogenesis
Alternative buffers	Sodium acetate may be considered in select patients with severe acidemia	Use sodium acetate with caution in patients with hepatic dysfunction

- Sodium acetate injection may be an appropriate substitute for toxicology emergencies. The initial dose for salicylate overdose, severe cardiac arrhythmias, and initial rapid treatment of QRS widening is 1 mEq per kg body weight infused over 15 to 20 minutes with a goal serum pH of 7.5 to 7.55. Maintenance infusions are sodium acetate 150 mEq in 1 L 5% dextrose.<sup>8</sup> The companies that produce this product will be placing it on emergency allocation to assure availability
- Sodium Bicarb tablets and powder may be a possibility for certain uses.

## **Safety**

- Few alternatives are available. Clinicians should make every effort to reserve supplies for critical care uses. A conservation strategy will be put in place for the region.
- If using sodium acetate as an alternative changes in practice are required as they cannot be infused over the same time period (15 to 20min vs 1 to 2 min). Please refer to the Saskatchewan Parenteral Manual for information.

## **Conservation Measures**

- Conserve sodium bicarbonate for critical uses.
- During the shortage it cannot be used for non-essential purposes such as buffering lidocaine or preparing extemporaneous oral solutions of omeprazole.
- If required we will look at methods to conserve supplies such as drawing up doses from vials rather than wasting unused product.
- If required we will review wardstock locations such as med rooms and crash carts and reduce inventory where possible.
- If purchasing premade Continuous Renal Replacement Therapy (CRRT) solutions, consider those with higher sodium bicarbonate concentrations.
- Physicians who order prepared oral solutions of omeprazole will be contacted to switch their patient over to lansoprazole (Prevacid) oral disintegrating tablets. Lexicomp has in the administration section of the lansoprazole monograph information that explains how a solution made from the oral disintegrating tablet can be administered using a syringe for different doses.

### **References:**

1. ASHP – 6/9/2017 - <http://www.ashp.org/shortages>
2. Healthpro Canada
3. Intravenous Sodium Bicarbonate Shortage: Alternative Strategies for the ICU – Society of Critical Care Medicine – 7/9/2012