Combining Sodium Bicarbonate and Lidocaine injection

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Referenced information from National Institutes of Health

DESCRIPTION:

Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution is a sterile, nonpyrogenic, solution of sodium bicarbonate (NaHCO3) in Water for Injection. It is added to an appropriate local anesthetic as a neutralizing agent immediately prior to administration.

The solution contains no bacteriostat, antimicrobial agent or added buffer and is intended only for single-use. pH is adjusted with carbon dioxide. Per the USP monograph for Sodium Bicarbonate Inj., pH is between 7.0 and 8.5. Osmolar concentration is 2 mOsmol/mL (calc.).

Sodium bicarbonate, 84 mg is equal to one milliequivalent each of Na+ and HCO3-.

Sodium Bicarbonate, USP is chemically designated as NaHC03, a white crystalline powder soluble in water. Sodium bicarbonate in water dissociates to provide sodium (Na+) and bicarbonate (HCO3-) ions.

Sodium (Na+) is the principal cation of the extracellular fluid and plays a large part in the therapy of fluid and electrolyte disturbances. Bicarbonate (HCO3-) is a normal constituent of body fluids and the normal plasma level ranges from 24 to 31 mEq/liter. Bicarbonate anion is considered “labile” since at a proper concentration of hydrogen ion (H+) it may be converted to carbonic acid (H2CO3) and thence to its volatile form, carbon dioxide (CO2) excreted by the lung. Normally a ratio of 1:20 (carbonic acid; bicarbonate) is present in the extracellular fluid. In a healthy adult with normal kidney function, practically all the glomerular filtered bicarbonate ion is reabsorbed; less than 1% is excreted in the urine.

Non-neutral parenteral solutions with a low (acidic) pH are known to cause chemical irritation of tissues.

INDICATIONS AND USAGE:

Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution is indicated to hasten onset of analgesia and reduce injection pain, by adjusting commercial preparations of Lidocaine w/ Epinephrine anesthetic solution to a more physiologic pH.

The practitioner should choose a volume of Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution to be mixed with Lidocaine w/ Epinephrine in a ratio of 1:10 (local anesthetic solution to sodium bicarbonate solution).

The below table provides a mixing guide showing for convenience the volumes of 8.4% Sodium Bicarbonate Neutralizing Additive Solution to be added to the commercial preparations of Lidocaine with Epinephrine in order to achieve a mixed ratio of 10:1.
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Anesthetic-to-Bicarbonate Solution Ratio Mixing Guide for 10:1

<table>
<thead>
<tr>
<th>Volume (mL), Lidocaine w/ Epinephrine (container type)</th>
<th>Volume (mL), 8.4% Sodium Bicarbonate Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 mL (cartridge)</td>
<td>0.18 mL</td>
</tr>
<tr>
<td>20 mL (Vial)</td>
<td>2.0 mL</td>
</tr>
<tr>
<td>30 mL (Vial)</td>
<td>3.0 mL</td>
</tr>
<tr>
<td>50 mL (Vial)</td>
<td>5.0 mL</td>
</tr>
</tbody>
</table>

CONTRAINDICATIONS:

Not for use as a systemic alkalizer.

WARNINGS:

None known.

PRECAUTIONS:

Administer local anesthetic solution immediately after combining with Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution.

When combining local anesthetic solution with Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution, use aseptic technique, mix thoroughly, and do not store.

Do not use unless Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution is clear, colorless, and free of particulates or cloudiness, and the container or seal is intact. Do not use if the inner or outer packaging are damaged. Discard unused portion.

Do not use local anesthetic combined with Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution unless the combined solution is clear, colorless, and free of particulates or cloudiness.

Parenteral drug products should be inspected visually for particulate matter, cloudiness and discoloration prior to administration, whenever solution and container permit.

Drug Interactions

Sodium Bicarbonate Inj., 8.4% USP Neutralizing Additive Solution and Lidocaine w/ Epinephrine are compatible. See Compatibility section under Sodium Bicarbonate in The Handbook on Injectable Drugs by Lawrence A. Trissel, 14th ed. 2007 (American Society of Health-System Pharmacists, Bethesda, MD).