sodium bicarbonate (soe-dee-um bye-kar-boe-nate)

Baking Soda, Bell-Ans, Citrocarbonate, Neut, Soda Mint

Classification
Therapeutic: antiacid agents
Pharmacologic: alkalinizing agents

Pregnancy Category C

Indications

Action
Acts as an alkalinizing agent by releasing bicarbonate ions. Following oral administration, bicarbonate is released, which is capable of neutralizing gastric acid and improving acid-base status.

Pharmacokinetics
Absorption: Following oral administration, sodium and bicarbonate are absorbed and result in metabolic alkalosis and alkaline urine. Distribution: Widely distributed into extracellular fluid. Metabolism and Excretion: Sodium and bicarbonate are excreted by the kidneys. Half-life: Unknown.

TIME/ACTION PROFILE (PO = antacid effect; IV = alkalinization)

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<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>PO</td>
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<tr>
<td>IV</td>
<td>immediate</td>
<td>rapid</td>
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Contraindications/Precautions
Contraindicated in: Metabolic or respiratory alkalosis; Hypocalcemia; Hypernatremia; Excessive chloride loss; As an antidote following ingestion of strong mineral acids; Patients on sodium-restricted diets (oral use as an antacid only); Severe abdominal pain of unknown cause, especially if associated with fever (oral use as an antacid only).

Use Cautionally in: HF; Renal insufficiency; Concurrent use of antacids; Chronic use as an antacid may cause metabolic alkalosis and possible sodium overload; PO: May: Risk of cerebral edema in children with diabetic ketoacidosis.

Adverse Reactions/Side Effects
CV: Edema.
GI: Flatulence, gastric distention.
F and E: Metabolic alkalosis, hypernatremia, hypercalcinemia, hypocalcemia, sodium and water retention.
Local: Irritation at IV site.
Neuro: Tetany, cerebral hemorrhage (with rapid injection in infants).

Interactions
Drug-Drug: Following oral administration, may prevent absorption of ketoconazole. Concurrent use with calcium-containing antacids may lead to milk-alkali syndrome. Urinary alkalinization may result in salicylate or barbiturate blood levels; Blood levels of quinidine, mexiletine, flecainide, or amphetamines; Risk of crystalluria from fluoroquinolones; May negate the protective effects of enteric-coated products (do not administer within 1–2 hr of each other).

Route/Dosage
Contains 12 mEq of sodium/g.

Alkalization of Urine
PO (Adults): 48 mEq (4 g) initially. Then 24–48 mEq (2–4 g) q 4 hr (up to 48 mEq q 4 hr) or 1 tsp of powder q 4 hr as needed.
PO (Children): 1–3.2 mEq/kg (60–80 mg/kg) per day in divided doses.
IV (Adults and Children): 2–5 mEq/kg as a 4–8 hr infusion.

Antacid
PO (Adults): Tablets/powder—325 mg/2 g q 4–6 times daily or 1 tsp q 4 hr as needed. Effervescent powder—5–10 g in water after meals. Patients ≥60 yr should receive 1.9–3.9 g after meals.

Systemic Alkalization/Cardiac Arrest
IV (Adults and Children and Infants): Cardiac arrest/urgent situations—1 mEq/kg, may repeat 0.5 mEq/kg q 10 min. Less urgent situations—1–2 mEq/kg as a 4–8 hr infusion.

Notes:
- Chronic use as an antacid may cause metabolic alkalosis and possible sodium overload.
- Severe abdominal pain of unknown cause, especially if associated with fever (oral use as an antacid only).

References:
- Discontinued.
Renal Tubular Acidosis

PO (Adults): 0.5–2 mEq/kg/day in 4–5 divided doses.
PO (Children): 2–3 mEq/kg/day in 3–4 divided doses.

NURSING IMPLICATIONS

Assessment
- IV: Assess fluid balance (urine output, daily weight, edema, lung sounds) throughout therapy. Report symptoms of fluid overload (hypertension, edema, dyspnea, tachycardia, altered mental status, anxiety, restlessness) if they occur.
- Assess patient for signs of acidosis (disorientation, headache, confusion, irritability, paresthesia, tetany, altered breathing pattern, hyperventilation, etc.) or alkalosis (confusion, irritability, paresthesia, tetany, altered breathing pattern).
- Observe IV site closely. Avoid extravasation, as tissue irritation or cellulitis may occur. If infiltration occurs, confer with physician or other health care professional regarding warm compresses and infiltration of site with lidocaine or hyaluronidase.
- Antacid: Assess patient for epigastric or abdominal pain and frank or occult blood in the stool, emesis, or gastric aspirate.
- Lab Test Considerations: Monitor serum sodium, potassium, calcium, bicarbonate concentrations, serum osmolarity, acid-base balance, and renal function prior to and periodically throughout therapy.
- Obtain arterial blood gases (ABGs) frequently in emergency situations and during parenteral therapy.

Potential Nursing Diagnoses

Impaired gas exchange (Indications)
- Nursing Diagnosis: Risk for injury related to IV therapy
- Implementation
- PO: Tablets must be taken with a full glass of water.
- When used in treatment of peptic ulcers, may be administered 1 and 3 hr after meals and at bedtime.

IV Administration
- pH: 7.4–7.6
- Direct IV: Used in cardiac arrest or urgent situations. Diluent: Use preservative-free 5% dextrose in water for injection. Rate: Administer by rapid bolus. IV line flushes and after administration to prevent incompatibility of medications.

Continuous Infusion: May be diluted in dextrose, saline, and dextrose/saline combinations. Premixed infusions are already diluted and ready to use. Rate: May be administered over 6–8 hr.

Y-Site Compatibility: acyclovir, amiodarone, amikacin, amphotericin B, ampicillin, amphotericin B cholesteryl sulfate complex, aprobarbital, asparaginase, atropine, aztreonam, bivalirudin, bumetanide, cefazolin, cefepime, ceftriaxone, chloramphenicol, cimetidine, cladribine, cyclophosphamide, cyclosporine, cyclosporine depot, dapsone, dexamethasone sodium phosphate, diltiazem, digoxin, docetaxel, doxorubicin, doxorubicin liposome, ducedant, dexamethasone, dexamethasone sodium phosphate, dexamethasone sodium succinate, digitoxin, diltiazem, doxycycline, fosphenytoin, furosemide, ganciclovir, gemcitabine, gemcitabine hydrochloride, gentamicin, granisetron, heparin, hydrocortisone sodium succinate, ifosfamide, indomethacin, insulin, ketorolac, labetalol, levofloxacin, lido- caine, metronidazole, milrinone, morphine, nafcillin, nitroglycerin, nitroprusside, paclitaxel, palonosetron, pantoprazole, pemetrexed, penicillin G potassium, phenylephrine, phytonadione, piperacillin/tazobactam, potassium chloride, procainamide, propa- drine, propofol, promethazine, ramipril, ranitidine, remifentanil, tacrolimus, teniposide, thiotepa, ticarcillin/clavulanate, torsemide, tobramycin, tolazoline, vasopressin, vitamin B complex with C, voriconazole.

Y-Site Incompatibility: allopurinol, amiodarone, amphotericin B, amphotericin B lipid complex, amphotericin B Cholesterol Complex, ampicillin, amphotericin B, amphotericin B oil emulsion, ampicillin/sulbactam, ampicillin/sulbactam, theophylline, diphenhydramine, diphenhydramine hydrochloride, doxorubicin, doxorubicin liposome, doxorubicin sulfate complex, droperidol, etoposide, etoposide phosphate, famotidine, fentanyl, filgrastim, fluconazole, fludarabine, furosemide, ganciclovir, gentamicin, granisetron, heparin, hydrocortisone sodium succinate, ifosfamide, indomethacin, insulin, ketorolac, labetalol, levofloxacin, lido- caine, metronidazole, milrinone, morphine, nafcillin, nitroglycerin, nitroprusside, paclitaxel, palonosetron, pantoprazole, pemetrexed, penicillin G potassium, phenylephrine, phytonadione, piperacillin/tazobactam, potassium chloride, procainamide, propa- drine, propofol, promethazine, ramipril, ranitidine, remifentanil, tacrolimus, teniposide, thiotepa, ticarcillin/clavulanate, torsemide, tobramycin, tolazoline, vasopressin, vitamin B complex with C, voriconazole.

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CONTINUED
sodium bicarbonate

Caution: 
- tin/dalfopristin, sargramostim, trimethoprim/sulfamethoxazole, troclear, 
- verapamil, vincristine, vinorelbine.

Incompatibility: Do not add to Ringer’s solution, LR, or Ionosol prod-

Patient/Family Teaching
- Instruct patient to take medication as directed. Take missed doses as soon as re-
- missions unless otherwise directed.
- Review symptoms of electrolyte imbalance with patients on chronic therapy; in-
- struct patients to notify health care professional if these symptoms occur.
- Advise patient to take milk products concurrently with this medication. Renal 
- calcium or hypercalcemia (milk-alkali syndrome) may result.
- Emphasize importance of regular follow-up examinations to monitor serum 
- electrolyte levels and acid-base balance and to monitor progress.
- Ate/Advise patient to avoid routine use of sodium bicarbonate for indiges-
- tions. Dyspepsia that persists >2 wk should be evaluated by a health care profes-
- sional.
- Advise patient on sodium-restricted diet to avoid use of baking soda as a home 
- remedy for indigestion.
- Instruct patient to notify health care professional if indigestion is accompanied by 
- chest pain, difficulty breathing, or diaphoresis or if stools become dark and tarry.

Evaluation/Desired Outcomes
- Increase in urinary pH.
- Clinical improvement of acidosis.
- Enhanced excretion of selected overdoses and poisonings.
- Decreased gastric discomfort.

Why was this drug prescribed for your patient?

- G - Generic Implication.
- D - Discontinued.