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**Directions for use**
**Read carefully!**

# B. Braun Compound Sodium Lactate Intravenous Infusion B.P. (Hartmann's Solution) with 5% Glucose

Full electrolyte solution for replacement of extracellular fluid

**Composition**

Each 100ml contains:

| | |
|---|---|
| Sodium Chloride | 0.600 g |
| Potassium Chloride | 0.040 g |
| Calcium Chloride · $2H_20$ | 0.027 g |
| Sodium Lactate | 0.312 g |
| Glucose Monohydrate for Parenteral Use | 5.500 g |
| Water for Injections to | 100 ml |

| **Electrolytes:** | **mmol/l** |
|---|---|
| $Na^+$ | 131 |
| $K^+$ | 5 |
| $Ca^{++}$ | 2 |
| $Cl^-$ | 111 |
| Bicarbonate$^-$ (as lactate$^-$) | 29 |
| Caloric Value: | 850 kJ/l ≙ 200 kcal/l |
| Osmolarity: | 555 m0sm/l |

**Characteristics**

**B. Braun Hartmann's Solution with 5% Glucose** has a similar electrolyte composition as the extracellular fluid. The lactate ion is gradually metabolised and converted to bicarbonate in a concentration also resembling that of extracellular fluid. Additionally the lactate ion exerts a slightly alkalinising effect.

**Indications**

Replacement of extracellular fluid loss (isotonic dehydration)
Salt depletion
Mild metabolic acidosis
Electrolyte substitution in burns

**Dosage**

Average dose: 1000ml/day
Drop rate : up to 120 drops/min corresponding to 360 ml/h

**Route of administration** I.V.

**Contraindications**

Hypertonic dehydration
Hyperhydration, oedema
Alkalosis
Hyperkalaemia, hypernatraemia, hyperlactatemia
Renal insufficiency

**Mechanisms of action**

Sodium Chloride is the principal salt involved in maintaining the osmotic tension of the blood and tissue. Changes in sodium and chloride levels change this osmotic tension and hence influence the movement of fluids and diffusion of salts in cellular tissue.

Sodium Lactate after absorption, is metabolised in 1 to 2 hours to bicarbonate, it then behaves as endogenous, bicarbonate, exerting an alkalizing effect. In the absence of bicarbonate deficiency, it is exerted by the kidney; urine becomes less acidic with accompanying diuresis.

Potassium Chloride provides potassium ions to the body. Potassium is the principal cation of intracellular fluid and is intimately involved in cell function and metabolism. It is essential for carbohydrate metabolism, gylcogen storage and for protein synthesis. Like Sodium it is integral in maintaining transmembrane potential and profoundly affects muscle, including the myocardium.

Similarly, Calcium Chloride provides calcium ions. Calcium is involved in the maintenance of normal muscle and nerve function, normal cardiac function as well as normal blood clotting.

Glucose is absorbed from the gastrointestinal tract, and oxidised as a source of energy, or stored in the liver as glycogen. Glucose is the only energy substrate which is directly, instantly and universally utilized by the body. Glucose is irreplaceable vital for the myocardium, brain and nerves.

**Symptoms and Treatment for overdosage**

Since the concentration of ions in this preparation mimics normal plasma levels, it is unlikely to cause ionic imbalance to any great extent. Any such tendency should be readily detected in the routine serum electrolyte monitoring.

However the development of any of the following symptoms calls for close scrutiny of blood electrolyte levels and appropriate management:
- Nausea, vomiting, diarrhoea, constipation, anorexia
- Abdominal pain, abdominal cramps
- Listlessness, weakness (general or muscular)
- Restlessness
- Thirst, dry mouth, swollen tongue, polyuria
- Pyrexia
- Paralysis
- Bone pain
- Diziness, drowsiness, confusion
- Cardiac complications

If the serum electrolyte check shows any particular ion to be elevated, it should then be managed accordingly.
General management of:
1. Hypernatraemia
   - reduce / eliminate $Na^+$ intake
   - in severe cases, treat with dialysis

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2. Hyperkalaemia
   - eliminate $K^+$ administration
   - withdraw any concomitant $K^+$ sparing diuretics
   - serum $K^+$ levels may be brought down by infusion of up to 50 - 125 grams of glucos over 1 hour, with insulin
   - severe cardiac toxicity, requiring immediate attention, may be treated with 10 - 20 ml of 10% Calcium Glutonate (IV) over 1-5 mins
   - severe cases may also benefit from dialysis

3. Hypercalcaemia
   - eliminate $Ca^{++}$ administration
   - increase fluid intake to combat dehydration and deposition of Calcium in the kidneys
   - administer Sodium Phosphate PO or IV to reduce serum calcium

**Side effects / Adverse reactions**

In the event, the body cannot adequately utilize or excrete any particular ion, it may accumulate to give symptoms characteristics of elevated levels of that particular ion.

**Precautions**

Because of the very high potassium content, it is essential that renal function be unimpaired.

- Sodium Lactate should not be administered to patients with severely impared liver function or seriously ill patients who are not particularly high risks of developing lactic acidosis.
- Diabetes mellitus (to monitor blood glucose level)

The compatibility of any additives to this solution should be checked before use.

**Shelf life**

The product must not be used beyond the expiry date stated on the label.

**Storage**

Do not store above 30°C.

**Presentation**

500ml, 1000ml plastic container

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Product Registration Holder and
Manufactured by:
**B. Braun Medical Industries Sdn. Bhd.**
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