PRODUCT INFORMATION

SODIUM CHLORIDE (0.9%) INTRAVENOUS INFUSION
in AVIVA Plastic Container

Name of the medicine
0.9% Sodium Chloride

Composition

The active ingredient is sodium chloride formulated in Water for Injections. The chemical name is sodium chloride with molecular formula NaCl. It occurs as a colourless or white crystal and is freely soluble in water and practically insoluble in anhydrous ethanol.

Chemical Structure: NaCl; MW = 58.44
CAS: 7647-14-5

Description

The Sodium Chloride (0.9%) Intravenous Infusion preparations are clear, colourless, practically free from visible particles, sterile and non-pyrogenic solutions. The concentrations of the active ingredients dissolved in a litre of Water for Injections are shown in Table 1 (see Presentation). They do not contain an antimicrobial agent or added buffer. However, during the sterilisation step a small amount of hydrochloric acid may leach out resulting in a slightly acidic solution with a pH of 4.5 – 7.0. Sodium Chloride (0.9%) solutions are isotonic as indicated by their osmolarity shown in Table 1.

Pharmacology

Mechanism of Action:
Sodium is the major cation of extracellular fluid and functions principally in the control of water distribution, fluid and electrolyte balance and osmotic pressure of body fluids. Chloride, the major extracellular anion, closely follows the physiological disposition of sodium cation in maintenance of acid-base balance, isotonicity and electrodynamic characteristic of the cells.

Thus, Sodium Chloride (0.9%) Intravenous Infusion has a value as a source of water and electrolytes.

Pharmacokinetics
As the Sodium Chloride (0.9%) Intravenous Infusion is directly administered to the systemic circulation by infusion, the bioavailability (absorption) of the active components is complete (100 per cent).
**Indications**

Normal saline can be used as the vehicle for many parenteral drugs and as an electrolyte replenisher for maintenance or replacement of deficits in extracellular fluid. It can also be used as a sterile irrigation medium.

**Contraindications**

The use of Sodium Chloride (0.9%) Intravenous Infusion requires careful evaluation of risks and benefits by the attending physician. It must not be used in the following conditions unless the physician has determined that potential benefits outweigh risks:

- congestive heart failure
- severe impairment of renal function,
- clinical states in which there exists oedema with sodium retention.
- liver cirrhosis
- irrigation during electrosurgical procedures

See Precautions.

**Precautions**

The safety of the AVIVA plastic bag container has been shown in tests with animals according to the USP biological tests for plastic container, as well by tissue culture toxicity studies.

In a dilute condition, osmolarity/L is approximately the same as osmolality/kg

**General**

Clinical evaluation and appropriate laboratory determinations are essential to monitor renal function, changes in fluid balance, electrolyte concentration and acid-base balance.

Sodium Chloride (0.9%) Intravenous Infusion may cause fluid and/or solute overload resulting in overhydration/hypervolemia and, for example, congested states, including central and peripheral edema. The risk of dilutional states is inversely proportional to the electrolyte concentrations of the injections. The risk of solute overload causing congested states with peripheral and pulmonary oedema is directly proportional to the electrolyte concentration administered.

Clinical evaluation and periodic laboratory determinations may be necessary to monitor changes in fluid balance, electrolyte concentrations, and acid-base balance during prolonged parenteral therapy or whenever the condition of the patient or the rate of administration warrants such evaluation.

Thus, caution should be exercised in patients with hypertension, heart failure, cerebral oedema, renal disease, pulmonary or peripheral oedema, pre-eclampsia, liver cirrhosis, conditions associated with sodium retention, and in geriatric patients, and infants.

Sodium Chloride (0.9%) Intravenous Infusion should be used with caution in patients receiving corticosteroids or corticotropin, because of potential sodium retention. Given that there is a possibility of systematic absorption of irrigation solutions, the same precautions apply. Displaced catheters or drainage tubes can lead to irrigation or infiltration of unintended structures or cavities. Excessive volume or pressure during irrigation of closed cavities may result in distention of tissues.
Sodium Chloride Intravenous Infusion should be used with particular caution, if at all, in patients with or at risk for Hypernatraemia, Hyperchloraemia, Hypervolemia and conditions that may cause sodium retention, fluid overload and edema (central and peripheral).

Its use may result in electrolyte abnormalities, including hypokalaemia and hyperkalaemia. See Adverse Reactions and Overdosage.

Rapid correction of hyponatraemia and hypernatraemia is potentially dangerous. Sodium Chloride Intravenous Infusion should be used with caution in patients receiving corticosteroids or corticotropin, because of potential sodium and fluid retention.

Hypersensitivity/infusion reactions, including hypotension, pyrexia, tremor, chills, urticaria, rash, and pruritus, have been reported.

Stop the infusion immediately if signs or symptoms of hypersensitivity/infusion reactions develop. Appropriate therapeutic countermeasures must be instituted as clinically indicated.

Carcinogenicity/mutagenicity
Studies with sodium chloride have not been performed to evaluate carcinogenic or mutagenic potential.

Use in pregnancy (Category A)
There are no adequate and well-controlled studies of Sodium Chloride (0.9%) Intravenous Infusion in animals or in pregnant women. However, Sodium Chloride (0.9%) Intravenous Infusion contains no components known to have adverse effects on the foetus at physiological concentrations.

Physicians should carefully consider the potential risks and benefits for each specific patient before administering Sodium Chloride.

Use in lactation
Following intravenous administration, a fraction of sodium and chloride ions is expected to be excreted into human milk. However, at physiological concentrations, neither of these ions is known to have adverse effects on a breastfeeding baby. Physicians should carefully consider the potential risks and benefits for each specific patient before administering Sodium Chloride.

Paediatric use
Safety and effectiveness of Sodium Chloride (0.9%) in paediatric patients have not been established by adequate or controlled trials. In paediatric use, doses are calculated for each patient based on clinical condition, including body weight, and laboratory data. Plasma electrolyte concentrations should be closely monitored in the paediatric population because of their impaired ability to regulate fluids and electrolytes.

Use in the Elderly
There are no adequate or well-controlled studies of Sodium Chloride (0.9%) Intravenous Infusion in subjects aged 65 and over to determine whether they respond differently from younger subjects.
When selecting the type of infusion solution and the volume/rate of infusion for a elderly patient, consider that elderly patients are generally more likely to have cardiac, renal, hepatic, and other diseases or concomitant drug therapy.

In general, dose selection for an elderly patient should be cautious as it is known that sodium chloride is substantially excreted by the kidney, and the risk of toxic reactions to this drug, may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection and thus renal function may be monitored.

**Effects on ability to drive and use machines**
There is no information on the effects of [Sodium Chloride 0.9%] on the ability to operate an automobile or other heavy machinery.

**Interactions with other drugs**
Sodium Chloride (0.9%) Intravenous Infusion should not be administered simultaneously with blood products through the same administration set, because of the possibility of pseudo-agglutination or haemolysis. The container label for this product bears the statement: do not administer simultaneously with blood.

If Sodium Chloride (0.9%) Intravenous Infusion is used as a vehicle for a drug delivery, a thorough review of the Product Information document(s) of such drug(s) should be made to ensure that no incompatibility might occur. Salting out, i.e. a precipitation of organic base drug may occur in the presence of salt.

Caution is advised in patients treated with lithium. Renal sodium and lithium clearance may be increased during administration of Sodium Chloride resulting in decreased lithium levels.

**Adverse effects**

Adverse effects, which may occur because of the solution or the technique of administration include febrile response, infection at the site of injection, venous thrombosis or phlebitis extending from the site of injection and extravasation. Excessive administration of sodium chloride causes hypernatraemia, resulting in dehydration of internal organs, hypokalaemia and acidosis(see Overdosage).

If an adverse reaction does occur, discontinue the infusion, evaluate the patient, institute appropriate therapeutic countermeasures and save the remainder of the fluid for examination if deemed necessary.

Inappropriate use of Sodium Chloride (0.9%) Intravenous Infusion may cause fluid or solute overload resulting in electrolyte abnormalities, overhydration, congestive conditions including central, peripheral or pulmonary oedema electrolyte imbalances and acid-base imbalance.
Post-marketing Adverse Reactions
The following adverse reactions have been reported in the post-marketing experience, listed by MedDRA System Organ Class (SOC), then, where feasible, by Preferred Term in order of severity.

- **IMMUNE SYSTEM DISORDERS:**
  Hypersensitivity/infusion reactions, including hypotension, pyrexia, tremor, chills, urticaria, rash, pruritus.

- **GENERAL DISORDERS AND ADMINISTRATION SITE CONDITIONS:**
  Infusion site reactions, such as infusion site erythema, injection site streaking, burning sensation, infusion site urticaria.

Other Adverse Reactions / Class Reactions
Use appropriate section of your label to incorporate the following class like reactions.
The following adverse reactions have not been reported with this product but may occur:

- Hypernatraemia
- Hyperchloraemic metabolic acidosis
- Hyponatremia, which may be symptomatic

Dosage and administration

**General directive**
Sodium Chloride (0.9%) is for intravenous infusion.

To be used as directed by the doctor.

Dosage, rate, and duration of administration are to be individualised and depend upon the indication for use, the patient’s age, weight, clinical condition, and concomitant treatment, and on the patient’s clinical and laboratory response to treatment.

Parenteral drug products should be inspected visually for particulate matter and discolouration prior to administration whenever solution and container permit. The solution should be clear and free from particles. Do not administer unless solution is clear and seal is intact. Additives may be incompatible. Suitability of potential additives has not been demonstrated. Complete information is not available. Those additives known to be incompatible should not be used. Before adding a substance or medication, verify that it is soluble and/or stable in water and that the pH range of Sodium Chloride solution is appropriate. The instructions for use of the medication to be added and other relevant literature must be consulted. Consult with a pharmacist, if available.

If in the informed judgment of the doctor, it is deemed advisable to introduce additives, use aseptic technique. Mix thoroughly when additives have been introduced. After addition, check for a possible colour change and/or the appearance of precipitates, insoluble complexes or crystals. Do not store solutions containing additives. The stability of this product when mixed with additive has not been demonstrated.

See Precautions, Interactions with other medicines.

When other electrolytes or medicines are added to this solution, the dosage and the infusion rate will also be dictated by the dose regimen of the additions.
The product should be used for one patient on one occasion only. Any unused portion should be discarded.

**Direction for use of AVIVA plastic container**

**Warning:** Do not connect flexible plastic containers in series in order to avoid air embolism due to possible residual air contained in the primary container.

Pressurising intravenous solutions contained in flexible plastic containers to increase flow rates can result in air embolism if the residual air in the container is not fully evacuated prior to administration.

Use of a vented intravenous administration set with the vent in the open position could result in air embolism. Vented intravenous administration sets with the vent in the open position should not be used with flexible plastic containers.

**To open:** Tear overwrap down side at slit and remove solution container. Some opacity of the plastic due to moisture absorption during the sterilisation process may be observed. This is normal and does not affect the solution quality or safety. The opacity will diminish gradually. Check for minute leaks by squeezing inner bag firmly. If leaks are found, discard the product as sterility may be impaired. If supplemental medication is desired, follow directions below.

**Preparation for Administration:** Sodium Chloride Intravenous Infusion is a sterile preparation. Thus, aseptic technique must be applied throughout the administration.

1. Suspend container from eyelet support.
2. Remove plastic protector from outlet port at the bottom of container.
3. Attach administration set.

**To Add Medication during solution administration:**

**Warning. Additives may be incompatible. See Precautions**

**Interactions with other drugs**

**To add medication before solution administration:** Supplemental medication may be added with needle through the medication injection port. To proceed, swab medication site (port) with alcohol swab. Using syringe with 0.63 to 0.80 mm needle, puncture resealable medication port and inject. Mix solution and medication thoroughly. For high density medication such as potassium chloride, squeeze ports while ports are upright and mix thoroughly. Close clamp on the set. Prepare medication port. Using syringe with 0.63 to 0.80 mm needle, puncture resealable medication port and inject. Remove container from IV pole and/or turn to upright position. Evaluate both ports by squeezing them while container is in the upright position. Mix solution and medication thoroughly. Return container to in use position and continue administration.

The solutions contain no antimicrobial agents, and are for single use in only one patient. Unused portions must be discarded.
Overdosage

Infusion of excess Sodium Chloride (0.9%) Intravenous preparations may cause
- fluid overload
- sodium overload (which can lead to central and/or peripheral edema).
- hypernatraemia, hyponatraemia
- other electrolyte abnormalities

No specific antidotes to this preparation are known.

Should overdose occur, prompt and careful clinical assessment is essential. Treat the symptoms and institute appropriate supportive measures as required.

**Symptoms of hypernatraemia**
Hypernatraemia may cause nausea, vomiting, diarrhoea and cramps, reduced salivation and lacrimation, increased thirst, hypotension, and tachycardia.

CNS effects include headache, dizziness, restlessness, weakness, muscle twitching or rigidity, respiratory paralysis, seizures, coma, and death.

**Treatment of hypernatraemia:**
Treatment usually requires free water replacement. Plasma sodium concentrations should be corrected slowly. If hypernatraemia is severe, I.V. hypotonic or isotonic saline or 5 percent glucose may be used to restore normal plasma sodium concentrations at a rate of no more than 10 to 12 mmol/L daily (0.5 mmol/L per hour). If plasma sodium levels are greater than 200 mmol/L or if the patient has renal impairment or is moribund, dialysis may be needed. Diazepam or other appropriate treatment may be required to treat convulsions.

**Symptoms of hyponatraemia:**
Symptoms may include headache, confusion, nausea, vomiting, somnolence weakness, cerebral oedema, seizures, coma, respiratory arrest, and death.

**Treatment of hyponatraemia:**
Acute hyponatraemia requires immediate assessment.
Symptomatic hyponatraemia associated with plasma sodium concentrations below 120mmol/L may require the administration of i.v. isotonic or hypertonic sodium chloride.
A loop diuretic may be required if there is fluid overload.
The aim is to render the patient asymptomatic, usually by restoring plasma sodium concentration to between 120mmol/L and 130mmol/L, at a rate of 10 to 12 mmol/L in each 24 hour period.

Careful monitoring of plasma sodium concentrations and total body water is essential.

As in hypernatraemia, rapid correction of hyponatraemia is potentially dangerous.

If neurological deterioration occurs, further investigation by MRI imaging of brain, including brain stem, is indicated.
Presentation and storage condition

The Sodium Chloride Intravenous Infusion dosage forms in AVIVA plastic containers are supplied as shown below:

Table 1: Sodium Chloride (0.9%) Intravenous Infusion preparations

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the active components [concentrations (%, mmol/1000 mL)]</th>
<th>Osmolarity&lt;sup&gt;a&lt;/sup&gt; (mOsmol/L)</th>
<th>ARTG / AUSTR</th>
<th>Pack Size (mL)</th>
<th>Shelf Life (months)</th>
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</thead>
<tbody>
<tr>
<td>AH6E1322</td>
<td>Sodium Chloride (0.9%, 154)</td>
<td>308 (300)</td>
<td>168509</td>
<td>250</td>
<td>15</td>
</tr>
<tr>
<td>AH6E1323</td>
<td>Sodium Chloride (0.9%, 154)</td>
<td>308 (300)</td>
<td>168510</td>
<td>500</td>
<td>22</td>
</tr>
<tr>
<td>AH6E1324</td>
<td>Sodium Chloride (0.9%, 154)</td>
<td>308 (300)</td>
<td>168511</td>
<td>1000</td>
<td>24</td>
</tr>
</tbody>
</table>

Note: Osmolarities<sup>a</sup> are calculated figures, whilst those in the bracket are approximate Osmolalities (mOsmol/kg).

Storage: Store below 25°C.

Name and address of sponsor

Baxter Healthcare Pty Ltd
1 Baxter Drive
Old Toongabbie NSW 2146
Australia

Poison schedule of the medicine

Unscheduled

Date of first inclusion in the Australian Register of Therapeutic Goods

15 September 2011

Date of most recent amendment

22 October 2013