Australian Product Information – BAXTER 0.45%, 0.9% or 3% SODIUM CHLORIDE (SODIUM CHLORIDE) INTRAVENOUS INFUSION

1 NAME OF THE MEDICINE

Sodium chloride

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Baxter Sodium Chloride Intravenous (IV) Infusion preparations are sterile, non-pyrogenic solutions of sodium chloride in Water for Injections. The preparations 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 4.0 – 7.0.

Baxter Sodium Chloride 0.9% IV Infusion is isotonic, Baxter Sodium Chloride 3% IV Infusion is hypertonic and Baxter Sodium Chloride 0.45% IV Infusion is hypotonic as indicated by their osmolarities. The concentration of sodium chloride in each preparation and their osmolarities are shown in Table 1 (see section 6.5 Nature and Contents of Container).

For the full list of excipients, see Section 6.1 List of Excipients.

3 PHARMACEUTICAL FORM

Solution for Intravenous Infusion.

4 CLINICAL PARTICULARS

4.1 THERAPEUTIC INDICATIONS

- Baxter Sodium Chloride 0.9% IV Infusion is indicated for extracellular fluid replacement and in the management of metabolic alkalosis in the presence of fluid loss, and for restoring or maintaining the concentration of sodium and chloride ions.
- Hypertonic Baxter Sodium Chloride 3% IV Infusion is used in the management of severe sodium chloride depletion when electrolyte restoration is required.
- Hypotonic Baxter Sodium Chloride 0.45% IV Infusion is mainly used as a hydrating agent solution.

4.2 DOSE AND METHOD OF ADMINISTRATION

General directive

Baxter Sodium Chloride IV Infusion 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 section 4.4 Special Warnings and Precautions for Use and section 4.5 Interactions with Other Medicines and Other Forms of Interactions).

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.

Hypertonic solutions are preferably administered via a large central vein. If hypertonic solutions are administered peripherally, a large arm vein should be used and, if possible, the injection site should be altered daily. Intravenous infusion of Baxter 3% Sodium Chloride IV Infusion should not exceed 100 mL/hr and serum electrolyte concentrations should be determined to assess the need for further administration.

Direction for use of VIAFLEX plastic container

Warning: Do not use flexible plastic containers in series connections. Such use could result in embolism due to residual air being drawn from the primary container before administration of the fluid from the secondary container is completed.

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*:** Baxter Sodium Chloride IV 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 Medications:

Warning: **Additives may be incompatible** (see section 4.4 Special Warnings and Precautions for Use and section 4.5 Interactions with Other Medicines and Other Forms of Interactions).

- *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.

- *To add medication during solution administration*: 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.

4.3 CONTRAINDICATIONS

The use of Baxter Sodium Chloride IV 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 (see section 4.4 Special Warnings and Precautions for Use).

Baxter Sodium Chloride 3% IV Infusion is contraindicated for electrolyte replacement in the presence of increased, normal, or only slightly decreased serum electrolyte concentrations.

4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE

Warning

Care should be exercised regarding possible incompatibility outcomes resulting from the interaction between the plastic container (VIAFLEX® plastic bag fabricated from a specially formulated polyvinyl chloride, PL 146 Plastic) or active ingredients and the added therapeutic substances (see section 4.2 Dose and Method of Administration). Small amounts of the components, e.g. di-2-ethylhexyl phthalate (DEHP) up to 5 ppm, may leach out during its shelf life. During the sterilisation step a small amount of hydrochloric acid may leach out resulting in a slightly acidic solution (see section 2 Qualitative and Quantitative Composition).

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

In a dilute condition, osmolarity/L is approximately the same as osmolality/kg. As shown in Table 1 (section 6.5 Nature and Contents of Container). Baxter Sodium Chloride 3% IV Infusion is hypertonic as indicated by its osmolarity, 1026 mOsmol/L. The administration of substantially hypertonic solution may lead to a wide variety of complications. This includes crenation (cell shrinkage) of red blood cells and general cellular dehydration. Thus it should be administered through a large central vein, for rapid dilution of the hypertonic solution (see section 4.2 Dose and Method of Administration).

In contrast, Baxter Sodium Chloride 0.45%IV Infusion is hypotonic (154 mOsmol/L). It may be infused with caution by peripheral vein administration, but may lead to cell swelling or oedema.

Hypersensitivity Reactions

Hypersensitivity/infusion reactions, including hypotension, pyrexia, tremor, chills, urticaria, rash, and pruritus, have been reported with Baxter Sodium Chloride 0.9% IV Infusion.

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

Hyponatraemia

The infusion of solutions with sodium (0.45% or <0.9%) may result in hyponatraemia, which may warrant close clinical monitoring. Hyponatraemia can lead to headache, nausea, seizures, lethargy, coma, cerebral oedema and death.

The risk for hyponatraemia is increased in children, elderly patients, women, postoperatively, persons with psychogenic polydipsia, patients treated with medications that increase the risk of hyponatraemia (such as certain antiepileptic and psychotropic medications).

The risk for developing hyponatraemic encephalopathy is increased in paediatric patients (≤16 years of age), women (in particular pre-menopausal women), patients with hypoxemia and in patients with underlying central nervous system disease.

Fluid and/or Solute Overload and Electrolyte Disturbances

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

Depending on the volume and rate of infusion, intravenous administration of Sodium Chloride IV Infusion may cause:

- fluid and/or solute overload resulting in overhydration/hypervolaemia and, for example, congested states, includiong central and peripheral oedema,
- clinically relevant electrolyte disturbances and acid-base imbalance.

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.

Baxter Sodium Chloride IV Infusion should be used with caution in patients receiving corticosteroids or corticotropin, because of potential sodium and fluid retention.

Baxter Sodium Chloride IV 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 oedema (central and peripheral).

Its use may result in electrolyte abnormalities, including hypokalaemia or hyperkalaemia (see section 4.8 Adverse Effects (Undesirable Effects) and section 4.9 Overdose).

Rapid correction of hyponatraemia or hypernatraemia is potentially dangerous (risk of serious neurologic complications). Dosage, rate, and duration of administration should be determined by a physician experienced in intravenous fluid therapy.

Use in Renal Impairment

Baxter Sodium Chloride (> 0.9%) IV Infusion should be administered with particular caution, if at all, to patients with severe renal impairment. In such patients administration of solutions containing high concentration of sodium chloride may result in sodium retention.

Use in the elderly

Geriatric patients are generally more likely to have cardiac, renal, hepatic, and other diseases or concomitant drug therapy and should be taken into consideration for selecting the type of infusion solution and the volume/rate of infusion.

The infusion of hypotonic fluids together with the non-osmotic secretion of anti-diuretic hormone may result in hyponatraemia. Hyponatraemia can lead to headache, nausea, seizures, lethargy, coma, cerebral oedema and death; therefore, acute symptomatic hyponatraemic encephalopathy is considered a medical emergency.

Paediatric use

Rapid correction of hyponatremia and hypernatremia is potentially dangerous (risk of serious neurologic complications). Dosage, rate, and duration of administration should be determined by a physician experienced in pediatric intravenous fluid therapy.
Plasma electrolyte concentrations should be closely monitored in the paediatric population because of their impaired ability to regulate fluids and electrolytes.

Effects on laboratory tests

The effect of this medicine on laboratory tests has not been established.

4.5 INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS

Baxter Sodium Chloride IV Infusion should not be administered simultaneously with blood products through the same administration set, because of the possibility of pseudo-agglutination or haemolysis.

If Baxter Sodium Chloride (0.45% or 0.9%) IV 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.

4.6 FERTILITY, PREGNANCY AND LACTATION

Effects on fertility

No data available.

Use in pregnancy (Category A)

There are no adequate and well-controlled studies of Baxter Sodium Chloride IV Infusion in animals or in pregnant women. However, Baxter Sodium Chloride IV 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

There are no adequate data from the use of Baxter Sodium Chloride IV Infusion in lactating women.

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.

4.7 EFFECTS ON ABILITY TO DRIVE AND USE MACHINES

There is no information on the effects of Baxter Sodium Chloride IV Infusion on the ability to operate automobile or other heavy machinery.

4.8 ADVERSE EFFECTS (UNDESIRABLE 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, extravasation and hypervolaemia.

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 Baxter Sodium Chloride IV 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 thrombosis, phlebitis, irritation, infusion site erythema, injection site streaking, burning sensation, infusion site urticaria.

Other Adverse Reactions / Class Reactions

The following adverse reactions have not been reported with this product but may occur:

- Hypernatraemia,
- hyperchloraemic metabolic acidosis,
- hyponatreamia, which may be symptomatic,
- hyperchloraemia (for products containing >0.9% Sodium Chloride).

Reporting suspected adverse effects

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at www.tga.gov.au/reporting-problems.

4.9 OVERDOSE

Infusion of excess Baxter Sodium Chloride IV Infusion preparations may cause:

- fluid overload,
- sodium overload (which can lead to central and/or peripheral oedema),
- hypernatraemia (0.9% or 3% Baxter Sodium Chloride IV Infusions),
- hyponatraemia (0.9% or 0.45% Baxter Sodium Chloride IV Infusions),
- 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, IV 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 120 mmol/L may require the administration of intravenous 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 120 mmol/L and 130 mmol/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.

For information on the management of overdose, contact the Poisons Information Centre on 13 11 26 (Australia).

5 PHARMACOLOGICAL PROPERTIES

5.1 PHARMACODYNAMIC PROPERTIES

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, Baxter Sodium Chloride IV Infusion has a value as a source of water and electrolytes.

Clinical trials

No data available.

5.2 PHARMACOKINETIC PROPERTIES

As Baxter Sodium Chloride IV Infusion is administered to the systemic circulation by intravenous infusion, the bioavailability (absorption) of the active components is complete (100 per cent).

5.3 PRECLINICAL SAFETY DATA

Genotoxicity

Studies with sodium chloride have not been performed to evaluate mutagenic potential.

Carcinogenicity

Studies with sodium chloride have not been performed to evaluate carcinogenic potential.

6 PHARMACEUTICAL PARTICULARS

6.1 LIST OF EXCIPIENTS

Water for Injections.

6.2 INCOMPATIBILITIES

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 (see section 4.2 Dose and Method of Administration).

Baxter Sodium Chloride IV Infusion should not be administered simultaneously with blood products through the same administration set, because of the possibility of pseudo-agglutination or haemolysis (see section 4.5 Interactions with Other Medicines and Other Forms of Interactions).

6.3 SHELF LIFE

In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG). The expiry date can be found on the packaging.

6.4 SPECIAL PRECAUTIONS FOR STORAGE

Store below 30°C. Do not freeze.

6.5 NATURE AND CONTENTS OF CONTAINER

Baxter Sodium Chloride IV Infusion is supplied in VIAFLEX plastic bags.

Table 1: BAXTER 0.45%, 0.9% or 3%SODIUM CHLORIDE IV Infusion preparations

Code No.	Name of the active components & concentrations %, (mmol/1000 mL)	Osmolarity$^{\alpha}$ mOsmol/L	ARTG	Pack Size*
AHB1306	Sodium chloride 0.9%, (154)	308 [300]	19477	50 mL
AHB1307	Sodium chloride 0.9%, (154)	308 [300]	48515	100 mL
AHB1322	Sodium chloride 0.9%, (154)	308 [300]	48517	250 mL

Code No.	Name of the active components & concentrations %, (mmol/1000 mL)	Osmolarity$^{\alpha}$ mOsmol/L	ARTG	Pack Size*
AHB1323	Sodium chloride 0.9%, (154)	308 [300]	48519	500 mL
AHB1324	Sodium chloride 0.9%, (154)	308 [300]	48520	1000 mL
AHB1363	Sodium chloride 0.9%, (154)	308 [300]	19477	50 ml x 2
AHB1364	Sodium chloride 0.9%, (154)	308 [300]	48515	100 mL x 2
AHB1313	Sodium chloride 0.45%, (77)	154 [150]	19472	500 mL x 18
AHB1354	Sodium chloride 3%, (513)	1026 [1000]	19500	1000 mL

Osmolarities$^{\alpha}$ are calculated figures, whilst those in the (bracket) are approximate Osmolalities (mOsmol/kg); AHB1354 product is ***hypertonic*** as indicated by the osmolarity of 1026 mOsmol/L, whilst AHB1313 is ***hypotonic.***

*Not all packs are marketed

6.6 SPECIAL PRECAUTIONS FOR DISPOSAL

Any unused product or waste material should be disposed of in accordance with local requirements.

6.7 PHYSICOCHEMICAL PROPERTIES

Chemical structure

Sodium chloride

Molecular formula: NaCl
Molecular Weight: 58.44
Appearance: colourless or white crystal
Solubility: freely soluble in water.

CAS number

Sodium chloride

CAS No.: 7647-14-5

7 MEDICINE SCHEDULE (POISONS STANDARD)

Not scheduled.

8 SPONSOR

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AUSTRALIA

9 DATE OF FIRST APPROVAL

AUST R 19472 30 Sep 1991
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AUST R 48517	21 Apr 1994
AUST R 48519	21 Apr 1994
AUST R 48520	21 Apr 1994

10 DATE OF REVISION

12 October 2018

Summary table of changes

Section Changed	Summary of new information
ALL	Reformatting to the latest TGA approved form
ALL	Term 'Intravenous' replaced by 'IV' where appropriate.
4.4	Subheading 'Hypersensitivity reactions' added. Subheading 'Fluid and/or Solute Overload and Electrolyte Disturbances' and related information added. Subheading 'Renal Impairment' and related information added. Inclusion of warning for paediatric use.
4.6	Inclusion of information related to use in lactation.
4.8	Inclusion of post-marketing adverse reactions and other adverse reactions.
10	Date of revision updated.