PLASMALYTE 148 IN 5% GLUCOSE

*Plasmalyte 148 in 5% Glucose infusion solution
(Multiple Electrolytes with Glucose Injection IV infusion solution)*

DESCRIPTION

Plasmalyte 148 in 5% Glucose infusion solution is a sterile, clear, non-pyrogenic hypertonic solution in a single dose container for intravenous administration.

Each 1000mL of Plasmalyte 148 in 5% Glucose infusion solution contains:

- Sodium Chloride 5.26g
- Sodium Gluconate 5.02g
- Sodium Acetate 3.68g
- Potassium Chloride 370mg
- Magnesium Chloride 300mg
- Anhydrous Glucose 50g
- Hydrochloric acid pH adjustment
- Water for Injections q.s. to 1000mL

pH range 4.0 to 6.0

Approximate Osmolality 584mOsm
Approximate Kilojoules 901kJ

Plasmalyte 148 in 5% Glucose infusion solution when administered intravenously, is a source of water, electrolytes, and calories. It contains no antimicrobial agents. The osmolarity is 584mOsm/kg. An injection with an osmolality within the range of 250 to 350mOsm/kg is considered to be isotonic. Administration of substantially hypertonic solutions (≥ 600mOsm/kg) may cause vein damage.
Each 1000mL of **Plasmalyte 148 in 5% Glucose** infusion solution has an ionic concentration of:

<table>
<thead>
<tr>
<th>Element</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>140mmol</td>
</tr>
<tr>
<td>Potassium</td>
<td>5.0mmol</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1.5mmol</td>
</tr>
<tr>
<td>Chloride</td>
<td>98mmol</td>
</tr>
<tr>
<td>Acetate</td>
<td>27mmol</td>
</tr>
<tr>
<td>Gluconate</td>
<td>23mmol</td>
</tr>
<tr>
<td>Glucose</td>
<td>278mmol</td>
</tr>
</tbody>
</table>

**PHARMACOLOGY**

**Plasmalyte 148 in 5% Glucose** infusion solution is a source of water, electrolytes and calories. It is capable of inducing diuresis depending on the clinical condition of the patient.

**Plasmalyte 148 in 5% Glucose** infusion solution produces a metabolic alkalinising effect. Acetate and gluconate ions are metabolised ultimately to carbon dioxide and water, which requires the consumption of hydrogen cations.

**INDICATIONS**

**Plasmalyte 148 in 5% Glucose** infusion solution is indicated as a source of water, electrolytes and calories or as an alkalinising agent.

**CONTRAINDICATIONS**

Solutions containing glucose may be contraindicated in patients with known allergy to corn or corn products.

**Plasmalyte 148 in 5% Glucose** infusion solution is contraindicated in patients with a known hypersensitivity to the product.

**Plasmalyte 148 in 5% Glucose** infusion solution must not be used in patients with clinically significant hyperglucaemia.

**PRECAUTIONS**

**Plasmalyte 148 in 5% Glucose** infusion solution should not be administered simultaneously with blood through the same administration set because of the possibility of pseudo-agglutination or haemolysis.
Hypersensitivity/infusion reactions, including anaphylactoid reactions, have been reported with Plasmalyte 148 in 5% Glucose infusion solution. The infusion must be stopped immediately if any signs or symptoms of a suspected hypersensitivity reaction develop. Appropriate therapeutic countermeasures must be instituted as clinically indicated.

Plasmalyte 148 in 5% Glucose infusion solution is a hypertonic solution, having an osmolarity of 584mOsmol/L. Administration of hypertonic solutions may cause venous irritation including phlebitis. Hyperosmolar solutions should be administered with caution, if at all, to patients with hyperosmolar states e.g. hypochloreaemic hypokalaemic alkalosis due to prolonged vomiting, pyloric stenosis, prolonged nasogastric suctioning.

Plasmalyte 148 in 5% Glucose infusion solution is not indicated for:
- The treatment of hypochloreaemic hypokalaemic alkalosis.
- The primary treatment of severe metabolic acidosis.
- Hypomagnesaemia.

Although Plasmalyte 148 in 5% Glucose infusion solution has a potassium concentration similar to the concentration in plasma, it is insufficient to produce a useful effect in case of severe potassium deficiency; therefore, it should not be used for correction of severe potassium deficiency.

Plasmalyte 148 in 5% Glucose infusion solution should be used with caution if at all, in patients with hyperkalaemia, or conditions predisposing to hyperkalaemia (such as severe renal impairment or adrenocortical insufficiency, acute dehydration or extensive tissue injury or burns) and in patients with cardiac disease, and in conditions where potassium retention is present.

Plasmalyte 148 in 5% Glucose infusion solution should be used with great care in patients with metabolic or respiratory alkalosis. The administration of acetate or gluconate ions should be done with great care in those conditions in which there is an increased level or an impaired utilisation of these ions, such as severe hepatic insufficiency.

Depending on the volume and rate of infusion, intravenous administration of Plasmalyte 148 in 5% Glucose infusion solution can cause:
- Fluid and/or solute overload resulting in overhydration/hypervolemia and for example congested states, including pulmonary congestion and oedema.
- Clinically relevant electrolyte disturbances and acid-base imbalance.

The risk of dilutional states is inversely proportional to the electrolyte concentrations of the infusion. The risk of solute overload causing congested states with peripheral and pulmonary oedema is directly proportional to the electrolyte concentrations of the infusion.
**Plasmalyte 148 in 5% Glucose** infusion solution should be administered with particular caution, to hypervolemia or overhydrated patients.

**Plasmalyte 148 in 5% Glucose** infusion solution should be used with great care, if at all, in patients with congestive heart failure, severe renal insufficiency, and in clinical states in which there exists oedema with sodium retention and fluid overload, such as patients with primary hyperaldosteronism, secondary hyperaldosteronism (associated with, for example, hypertension, congestive heart failure, renal artery stenosis or nephrosclerosis) or preeclampsia.

Clinical evaluation and periodic laboratory determinations are 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.

**Plasmalyte 148 in 5% Glucose** infusion solution should be used with particular caution, if at all, in patients with alkalosis or at risk for alkalosis. Excess administration may result in metabolic alkalosis.

Solutions containing magnesium should be used with caution, if at all, in patients with:
- Hypermagnesaemia or conditions predisposing to hypermagnesaemia including, but not limited to, severe renal impairment or magnesium therapy such as eclampsia.
- Myasthenia gravis.

In patients with diminished renal function, administration of **Plasmalyte 148 in 5% Glucose** infusion solution may result in sodium and/or potassium or magnesium retention.

**Plasmalyte 148 in 5% Glucose** infusion solution contains no calcium and an increase in plasma pH due to its alkalinising effect may lower the concentration of ionised (not protein-bound) calcium. **Plasmalyte 148 in 5% Glucose** infusion solution should be administered with particular caution, if at all, to patients with hypocalcaemia.

Because **Plasmalyte 148 in 5% Glucose** infusion solution contains glucose as well as gluconate (a portion of which may be metabolized into glucose), administration of **Plasmalyte 148 in 5% Glucose** infusion solution that exceeds the metabolic capacity for glucose may lead to hyperglycaemia.

**Plasmalyte 148 in 5% Glucose** infusion solution should be used with caution in patients with impaired glucose tolerance or diabetes mellitus.

In order to avoid hyperglycaemia the infusion rate should not exceed the patient’s ability to utilise glucose. Hyperglycaemia has been implicated in increasing cerebral ischemic brain damage and impairing recovery after acute ischemic strokes. Caution is recommended in using glucose-containing solutions in such patients.
Early hyperglycaemia has been associated with poor outcomes in patients with severe traumatic brain injury. Glucose-containing solutions should, therefore, be used with caution in patients with head injury, in particular during the first 24 hours following the trauma.

If hyperglycaemia occurs, the rate of glucose administration should be reduced and/or insulin administered, or the insulin dose adjusted.

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 results 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.

**Use in pregnancy (no category)**

Intrapartum maternal intravenous infusion of glucose-containing solutions may result in foetal insulin production, with an associated risk of foetal hyperglycaemia and metabolic acidosis as well as rebound hypoglycaemia in the neonate. Physicians should carefully consider the potential risks and benefits for each specific patient before administering **Plasmalyte 148 in 5% Glucose** infusion solution.

**Use in lactation**

There are no adequate data from the use of **Plasmalyte 148 in 5% Glucose** infusion solution in lactating women. The potential risks and benefits for each specific patient should be carefully considered before using **Plasmalyte 148 in 5% Glucose** infusion solution in lactating women.

**Paediatric use**

Safety and effectiveness of **Plasmalyte 148 in 5% Glucose** infusion solution in paediatric patients have not been established by adequate or well controlled trials, however, the use of electrolyte solutions in the paediatric population is referenced in the medical literature. The precautions and adverse reactions identified in this document should be observed in the paediatric population.

The infusion rate and volume depends on the age, weight, clinical and metabolic conditions of the patient, concomitant therapy and should be determined by the consulting physician experienced in paediatric intravenous fluid therapy.

In very low birth weight infants, excessive or rapid administration of glucose infusion may result in increased serum osmolarity and possible haemorrhage.
Newborns – especially those born premature and with low birth weight - are at increased risk of developing hypo- or hyperglycaemia and therefore need close monitoring during treatment with intravenous glucose solutions to ensure adequate glycaemic control in order to avoid potential long term adverse effects. Hypoglycaemia in the newborn can cause prolonged seizures, coma and brain damage. Hyperglycaemia has been associated with intraventricular haemorrhage, late onset bacterial and fungal infection, retinopathy of prematurity, necrotising enterocolitits, bronchopulmonary dysplasia, prolonged length of hospital stay, and death.

Use in the elderly

Clinical studies of Plasmalyte 148 in 5% Glucose infusion solution did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal or cardiac function, and of concomitant disease or medicine therapy.

When selecting the type of infusion solution and the volume/rate of infusion for an elderly patient, consider that elderly patients are generally more likely to have cardiac, renal, hepatic and other diseases or concomitant medicinal therapy.

Carcinogenicity

Studies with Plasmalyte 148 in 5% Glucose infusion solution have not been performed to evaluate carcinogenic potential.

Genotoxicity

Studies with Plasmalyte 148 in 5% Glucose infusion solution have not been performed to evaluate mutagenic potential.

Effects on fertility

Studies with Plasmalyte 148 in 5% Glucose infusion solution have not been performed to evaluate effect on fertility.

Effect on laboratory tests

There have been reports of false-positive test results using the Bio Rad Laboratories Platelia Aspergillus EIA test in patients receiving Baxter gluconate containing Plasmalyte solutions. These patients were subsequently found to be free of Aspergillus infection. Therefore, positive test results for this test in patients receiving Baxter
gluconate containing Plasmalyte solutions should be interpreted cautiously by other diagnostic methods.

INTERACTIONS WITH OTHER MEDICINES

Caution must be exercised in the administration of Plasmalyte 148 in 5% Glucose infusion solution to patients treated with medicines that may increase the risk of sodium and fluid retention such as corticosteroids or corticotropin.

Caution is advised when administering Plasmalyte 148 in 5% Glucose infusion solution to patients treated with medicines for which renal elimination is pH dependent. Due to its alkalinising effect (formation of bicarbonate), Plasmalyte 148 in 5% Glucose infusion solution may interfere with the elimination of such medicines

- Renal clearance of acidic medicines such as salicylates, barbiturates and lithium may be increased.
- Renal clearance of alkaline medicines such as sympathomimetics e.g. ephedrine, pseudoephedrine, quinidine or dextroamphetamine (dexamphetamine) sulfate may be decreased.

Because of its potassium content, Plasmalyte 148 in 5% Glucose infusion solution should be administered with caution in patients treated with agents or products that can cause hyperkalaemia or increase the risk of hyperkalaemia, such as potassium sparing diuretics (amiloride, spironolactone, triamterene) with ACE inhibitors, angiotensin II receptor antagonists or the immunosuppressant tacrolimus and cyclosporine.

General

The Viaflex plastic container is fabricated from a specially formulated polyvinyl chloride (PL 146 Plastic). The amount of water that can permeate from inside the container into the overwrap is insufficient to affect the solution significantly. Solution in contact with the plastic container can leach out certain chemical components from the plastic in very small amounts; however, biological testing was supportive of the safety of the plastic container material.

ADVERSE EFFECTS

Reactions that may occur because of the solution or the technique of administration include febrile response or infection at the site of infusion. Other reactions that may occur include:

Circulatory effects: Extravasation.
- Hypervolemia.
- Venous thrombosis.
- Phlebitis extending from the site of injection.
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.

The following adverse reactions have been reported in the post-marketing experience with unspecified Plasmalyte products and Plasmalyte products without Glucose (listed by MedDRA System Organ Class (SOC), then by Preferred Term in order of severity, where feasible):

IMMUNE SYSTEM DISORDERS: Hypersensitivity/infusion reactions including anaphylactoid reaction and the following manifestations: hypotension, chest discomfort, dyspnoea, wheezing, flushing, hyperaemia, asthenia, urticaria, cold sweat, pyrexia and chills.

METABOLISM AND NUTRITION DISORDERS: Hyperkalaemia and hyperglycaemia.

GENERAL DISORDERS AND ADMINISTRATION SITE CONDITIONS: Infusion site reaction (e.g. burning sensation).

Other adverse reactions reported with Plasmalyte products without Glucose are other manifestations of hypersensitivity/infusion reactions including tachycardia, palpitations, chest pain, respiratory rate increased, feeling abnormal, piloerection, oedema peripheral and infusion site pain.

**DOSAGE AND ADMINISTRATION**

**Dosage**

As directed by the physician. Dosage is dependent on age, weight and clinical condition of the patient as well as laboratory determinations. 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.

The infusion rate and volume of intravenous solutions containing glucose should be selected with caution in children.

Each Viaflex container is for single patient use only.

All injections in Viaflex plastic containers are intended for intravenous administration using sterile equipment.

As reported in the literature, the dosage and constant infusion rate of intravenous glucose must be selected with caution in paediatric patients, particularly neonates and
low birth weight infants, because of the increased risk of hyperglycaemia/hypoglycaemia.

**Directions for use**

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

Parenteral medicine products should be inspected visually for particular matter and discolouration prior to the administration whenever solution and container permit. Do not administer unless solution is clear and seal is intact.

**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 the inner bag firmly. If leaks are found, discard solution, as sterility may be impaired. If supplemental medication is desired, follow the directions below.

**Preparation for Administration:**
1. Suspend container from eyelet support.
2. Remove plastic protector from outlet port at bottom of container.
3. Attach administration set. Refer to complete directions accompanying set.

**To Add Medication**

**Warning:** Additives may be incompatible. Those additives known to be incompatible should not be used. Complete information is not available. Consult with a pharmacist if available. As with all parenteral solutions, compatibility of the additives with the solution must be assessed before addition. Before adding a substance or medication, verify that it is soluble and/or stable in water and that the pH range of Plasmalyte 148 in 5% Glucose infusion solution is appropriate. After addition, check for possible colour change and/or the appearance of precipitates, insoluble complexes or crystals. The instructions for use of the medication to be added and other relevant literature must be consulted.

If, in the informed judgement of the physician, it is deemed advisable to introduce additives, use aseptic technique. Mix thoroughly when additives have been introduced. Do not store solutions containing additives.
To add medication before solution administration:
1. Prepare medication site.
2. Using a syringe with a 0.63 to 0.80mm needle, puncture resealable medication port and inject.
3. 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:
1. Close clamp on the set.
2. Prepare medication site.
3. Using a syringe with a 0.63 to 0.80mm needle, puncture resealable medication port and inject.
4. Remove container from IV pole and turn to an upright position.
5. Evacuate both ports by squeezing them while container is in the upright position.
6. Mix solution and medication thoroughly.
7. Return container to in-use position and continue administration.

After opening the container, the contents should be used immediately and should not be stored for a subsequent infusion. Do not reconnect any partially used containers.

OVERDOSAGE

If overdosage is suspected (through the monitoring of electrolytes, especially sodium and potassium), administration of the medicine should be discontinued and the patient observed closely.

Excessive administration of Plasmalyte 148 in 5% Glucose infusion solution may lead to metabolic alkalosis. Metabolic alkalosis may be accompanied by hypokalaemia as well as a decrease in ionised serum calcium and magnesium (see PRECAUTIONS).

An excessive volume of Plasmalyte 148 in 5% Glucose infusion solution may lead to fluid and sodium overload with a risk of oedema (peripheral and/or pulmonary) particularly when renal sodium excretion is impaired (see PRECAUTIONS).

Excessive administration of potassium may lead to the development of hyperkalaemia, especially in patients with severe renal impairment (see PRECAUTIONS).

Excessive administration of magnesium may lead to hypermagnesaemia (see PRECAUTIONS).

Excessive administration of glucose-containing solution may lead to hyperglycaemia, hyperosmolarity, osmotic diuresis and dehydration.

When assessing an overdose, any additives in the solution must also be considered. The effect of overdose may require immediate medical attention and treatment.
PRESENTATION AND STORAGE CONDITIONS

**Plasmalyte 148 in 5% Glucose** infusion solution in Viaflex plastic containers is available as shown below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Size (mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHB2584</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Storage Condition**

Store product below 30°C. Do not freeze.

MEDICINE CLASSIFICATION

General Sale Medicine.

NAME AND ADDRESS

**Plasmalyte 148 in 5% Glucose** is distributed in New Zealand by:

Baxter Healthcare Ltd  
33 Vestey Drive  
Mt Wellington  
Auckland 1060

**Plasmalyte 148 in 5% Glucose** is distributed in Australia by:

Baxter Healthcare Pty Ltd  
1 Baxter Drive  
Old Toongabbie, NSW 2146.

DATE OF PREPARATION

28 July 2015

*Based on Australian PI most recent amendment 2 April 2015; and CCSI 420 2014 0828.*

*Please refer to the Medsafe website (www.medsafe.govt.nz) for most recent data sheet.*

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