



**National Agency for Food & Drug Administration  
&  
Control  
(NAFDAC)**

**Registration & Regulatory Affairs (R & R)  
Directorate**

**SUMMARY OF PRODUCT CHARACTERISTICS  
(SmPC)  
4.3% DEXTROSE SALINE INFUSION**

## SUMMARY OF PRODUCT CHARACTERISTICS (SmPC)

### 1. NAME OF THE MEDICINAL PRODUCT

4.3% Dextrose and 0.18% saline solution for infusion BP

### 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Sodium chloride: 1.80g/l

Glucose (as monohydrate): 43.00g/l

Each ml contains 1.8mg sodium chloride and 43mg glucose (as monohydrate)

For a full list of excipients, see Section 6.1.

### 3. PHARMACEUTICAL form

Solution for infusion.

Clear solution, free from visible particles

### 4. Clinical particulars

#### 4.1 Therapeutic indications

4.3% Dextrose and 0.18% saline is used in the following indications:

Dehydration treatment due to a moderated loss of sodium and chloride (vomiting, diarrhoea, renal disorders, overuse of diuretics) in cases where a source of energy is required (particularly starvation).

Paediatric Population

This product should only be used in paediatric specialist settings (such as renal, hepatic and cardiac units, high dependency units and intensive care units) for intravenous fluid therapy requiring the use of 0.18% sodium chloride and 4.3% glucose to maintain fluid and electrolyte balance.

#### 4.2 Posology and method of administration

##### Posology

The choice of the specific sodium chloride and glucose concentration, dosage, volume, rate and duration of administration depends on the age, weight, clinical condition of the patient and concomitant therapy. It should be determined by a physician. For patients with electrolyte and glucose abnormalities and for paediatric patients, consult a physician experienced in intravenous fluid therapy. Rapid correction of hyponatraemia and hypernatraemia is potentially dangerous (risk of serious neurologic complications).

##### ***Adults, older patients and adolescents (age 12 years and over):***

The Recommended dosage is 500 ml to 3 L/24h

Administration rate

The infusion rate is usually 40 ml/kg/24h and should not exceed the patient's glucose oxidation capacities in order to avoid hyperglycaemia. Therefore, the maximum acute administration rate is 5 mg/kg/min.

##### ***Paediatric Population***

Use of 0.18% sodium chloride and 4.3% glucose should be restricted to specialist paediatric settings such as renal, hepatic and cardiac units, high dependency units and intensive care units.

The dosage varies with weight:

0-10 kg body weight:	100 ml/kg/24h
10-20 kg body weight:	1000 ml + (50 ml/kg over 10 kg)/24h
> 20 kg body weight:	1500 ml + (20 ml/kg over 20 kg)/24h.

The administration rate varies with weight:

0-10 kg body weight:	6-8 ml/kg/h
10-20 kg body weight:	4-6 ml/kg/h
> 20 kg body weight:	2-4 ml/kg/h

The infusion rate should not exceed the patient's glucose oxidation capacities in order to avoid hyperglycaemia. Therefore the maximum acute administration rate is 10-18 mg/kg/min, depending on the total body mass.

For all patients, a gradual increase of flow rate should be considered when starting administration of glucose containing products.

#### **Method of administration**

The administration is performed by intravenous infusion.

4.3% Dextrose and 0.18% saline solution is hypotonic and hyperosmolar, due to the glucose content.

#### ***Precautions to be taken before manipulating or administering the product***

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration. Do not administer unless the solution is clear and the seal is intact. Administer immediately following the insertion of infusion set.

Do not remove unit from overwrap until ready for use.

The inner bag maintains the sterility of the product.

The solution should be administered with sterile equipment using an aseptic technique.

The equipment should be primed with the solution in order to prevent air entering the system.

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 the administration of the fluid from the secondary container is completed.

Pressurizing 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.

Additives may be introduced before or during infusion through the resealable medication port. When additive is used, verify tonicity prior to parenteral administration. Hyperosmolar solutions may cause venous irritation and phlebitis. Thus, any hyperosmolar solution is recommended to be administered through a large central vein, for rapid dilution of the hyperosmotic solution.

For further information on the product with additives, please see sections 6.2, 6.3 and 6.6.

#### ***Monitoring***

Fluid balance and the concentrations of glucose and electrolytes (especially sodium) in plasma must be monitored during administration. Electrolyte supplementation may be indicated according to the clinical needs of the patient.

#### **4.3 Contraindications** The solution is contraindicated in patients presenting with:

- Known hypersensitivity to the product
- Extracellular hyperhydration or hypervolaemia
- Fluid and sodium retention

- Severe renal insufficiency (with oliguria/anuria)
- Uncompensated cardiac failure
- Hyponatraemia or hypochloraemia
- General oedema and ascitic cirrhosis
- Clinically significant hyperglycaemia.

The solution is also contraindicated in case of uncompensated diabetes, other known glucose intolerances (such as metabolic stress situations), hyperosmolar coma or hyperlactataemia.

#### **Paediatric Population**

This product should not be used in children except in paediatric specialist settings (such as renal, hepatic and cardiac units high dependency units and intensive care units) under expert medical supervision.

#### **4.4 Special warnings and precautions for use**

The infusion of solutions with sodium concentrations <0.9% may result in hyponatraemia. Close clinical monitoring may be warranted.

Hyponatraemia can lead to headache, nausea, seizures, lethargy, coma, cerebral oedema, and death. Acute symptomatic hyponatraemic encephalopathy is considered a medical emergency.

The risk for hyponatraemia is increased, for example,

- in children
- in older patients
- in women
- postoperatively
- in persons with psychogenic polydipsia
- in 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, for example,

- In paediatric patients ( $\leq 16$  years of age)
- in women (in particular, premenopausal women)
- in patients with hypoxaemia
- in patients with underlying central nervous system disease.

#### **Sodium retention, fluid overload and oedema**

4.3% Dextrose and 0.18% saline solution should be used with particular caution, in:

• Patients with conditions that may cause sodium retention, fluid overload and oedema (central and peripheral), such as	
	o Primary hyperaldosteronism, o Secondary hyperaldosteronism associated with, for example,
	- hypertension, - congestive heart failure, - liver disease (including cirrhosis), - renal disease (including renal artery stenosis, nephrosclerosis)
	o Pre-eclampsia.
• Patients taking medications that may increase the risk of sodium and fluid retention, such as corticosteroids	

### ***Hypokalaemia***

The infusion of 4.3% Dextrose and 0.18% saline solution may result in hypokalaemia. This medicine should be used with particular caution in patients with or at risk for hypokalemia. Close clinical monitoring may be warranted in, for example:

- persons with metabolic alkalosis
- persons with thyrotoxic periodic paralysis, administration of intravenous glucose has been associated in aggravating hypokalaemia
- persons with increased gastrointestinal losses (e.g., diarrhea, vomiting)
- prolonged low potassium diet
- persons with primary hyperaldosteronism
- patients treated with medications that increase the risk of hypokalaemia (e.g. diuretics, beta-2 agonist, or insulin)

### ***Hypo- and hyperosmolality, serum electrolytes and water imbalance***

Depending on the volume and rate of infusion and depending on a patient's underlying clinical condition and capability to metabolize glucose, intravenous administration of 4.3% Dextrose and 0.18% saline solution can cause:

- Hypo-osmolality
- Hyperosmolality, osmotic diuresis and dehydration
- Electrolyte disturbances such as
  - o hyponatraemia (see above),
  - o hypokalaemia (see above),
  - o hypophosphataemia,
  - o hypomagnesaemia,
- Overhydration/hypervolaemia and, for example, congested states, including central (e.g., pulmonary congestion) and peripheral oedema.

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.

### ***Hyperglycaemia***

Rapid administration of glucose solutions may produce substantial hyperglycaemia and a hyperosmolar syndrome. In order to avoid hyperglycaemia the infusion rate should not exceed the patient's ability to utilize glucose.

To reduce the risk of hyperglycaemia-associated complications, the infusion rate must be adjusted and/or insulin administered if blood glucose levels exceed levels considered acceptable for the individual patient.

Intravenous glucose should be administered with caution in patients with, for example:

- impaired glucose tolerance (such as in diabetes mellitus, renal impairment, or in the presence of sepsis, trauma or shock),
- severe malnutrition (risk of precipitating a refeeding syndrome, see below),
- thiamine deficiency, e.g., in patients with chronic alcoholism (risk of severe lactic acidosis due to impaired oxidative metabolism of pyruvate),
- water and electrolyte disturbances that could be aggravated by increased glucose and/or free water load

Other groups of patients in whom 4.3% Dextrose and 0.18% saline solution should be used with caution include:

- patients with ischemic stroke. hyperglycaemia has been implicated in increasing cerebral ischemic brain damage and impairing recovery after acute ischemic strokes.

- patients with severe traumatic brain injury (in particular during the first 24 hours following the trauma). Early hyperglycaemia has been associated with poor outcomes in patients with severe traumatic brain injury.

- Newborns (see Paediatric glycaemia-related issues).

Prolonged intravenous administration of glucose and associated hyperglycaemia may result in decreased rates of glucose-stimulated insulin secretion.

### ***Hypersensitivity Reactions***

- Hypersensitivity/infusion reactions, including anaphylaxis, have been reported (see section 4.8).
- Stop the infusion immediately if signs or symptoms of hypersensitivity/infusion reactions develop. Appropriate therapeutic countermeasures must be instituted as clinically indicated.
- Solutions containing glucose should be used with caution in patients with known allergy to corn or corn products

### ***Refeeding syndrome***

Refeeding severely undernourished patients may result in the refeeding syndrome that is characterized by the shift of potassium, phosphorus and magnesium intracellularly as the patient becomes anabolic. Thiamine deficiency and fluid retention may also develop. Careful monitoring and slowly increasing nutrient intake while avoiding overfeeding can prevent these complications.

### ***Severe renal impairment***

4.3% Dextrose and 0.18% saline solution should be administered with particular caution to patients at risk of (severe) renal impairment. In such patients, administration may result in sodium retention and/or fluid overload.

### ***Paediatric use***

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

### ***Paediatric Population***

Intravenous fluid therapy should be closely monitored in the paediatric populations as they may have impaired ability to regulate fluids and electrolytes. Adequate urine flow must be ensured and careful monitoring of fluid balance, plasma and urinary electrolyte concentrations are essential.

### ***Paediatric glycaemia-related issues***

Newborns, especially those born premature and with low birth weight, are at increased risk of developing hypo- or hyperglycaemia. Close monitoring during treatment with intravenous glucose solutions is needed to ensure adequate glycaemic control, in order to avoid potential long term adverse effects.

Hypoglycaemia in the newborn can cause, e.g.,

- prolonged seizures,
- coma and
- cerebral injury.

Hyperglycaemia has been associated with

- cerebral injury, including intraventricular haemorrhage,
- late onset bacterial and fungal infection,
- retinopathy of prematurity,
- necrotizing enterocolitis,
- increased oxygen requirements,
- prolonged length of hospital stay and
- death.

### ***Paediatric hyponatraemia-related issues***

- Children (including neonates and older children) are at increased risk of developing hyponatraemia as well as for developing hyponatraemic encephalopathy.
- The infusion of hypotonic fluids together with the non-osmotic secretion of ADH may result in hyponatraemia.
- Hyponatraemia can lead to headache, nausea, seizures, lethargy, coma, cerebral edema and death; therefore, acute symptomatic hyponatraemic encephalopathy is considered a medical emergency.
- Plasma electrolyte concentrations should be closely monitored in the paediatric population.
- Rapid correction of hyponatraemia is potentially dangerous (risk of serious neurologic complications). Dosage, rate, and duration of administration should be determined by a physician experienced in paediatric intravenous fluid therapy.

### ***Blood***

4.3% Dextrose and 0.18% saline solution should not be administered simultaneously with blood through the same administration set because of the possibility of pseudoagglutination or haemolysis.

### ***Geriatric use***

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

## **4.5 Interaction with other medicinal products and other forms of interaction**

Both the glycaemic and effects on water and electrolyte balance should be taken into account when administering 4.3% Dextrose and 0.18% saline solution to patients treated with other substances that affect glycaemic control or fluid and/or electrolyte balance.

Caution is advised in patients treated with

- lithium. Renal sodium and lithium clearance may be increased during administration and can result in decreased lithium levels.
- corticosteroids, which are associated with the retention of sodium and water (with oedema and hypertension).
- diuretics, beta-2 agonist, or insulin, whom increase the risk of hypokalemia
- certain antiepileptic and psychotropic medications that increase the risk of hyponatraemia.

## **4.6 Pregnancy and lactation**

### ***Pregnancy***

Intrapartum maternal intravenous glucose infusion may result in foetal hyperglycaemia and metabolic acidosis as well as rebound neonatal hypoglycaemia due to foetal insulin production.

### ***Fertility***

There is no information on the effects of 4.3% Dextrose and 0.18% saline solution on fertility

### ***Lactation***

4.3% Dextrose and 0.18% saline solution can be used during breast-feeding. The potential risks and benefits for each specific patient should be carefully considered before administration.

## **4.7 Effects on ability to drive and use machines**

There is no information on the effects of 4.3% Dextrose and 0.18% saline solution on the ability to operate an automobile or other heavy machinery

## **4.8 Undesirable effects**

The following adverse reactions have been reported in post-marketing experience, listed by MedDRA System Organ Class (SOC), then where feasible, by Preferred Term in order of severity.

Frequencies cannot be estimated from the available data as all listed adverse reactions are based on spontaneous reporting

System Organ Class	Adverse reactions (Preferred terms)
Metabolism and nutrition disorders	Hypervolaemia
	Electrolyte imbalance
	Hyponatraemia*
Cardiac disorders	Cardiac failure
Renal and urinary disorders	Polyuria
Immune system disorders	Hypersensitivity
	Anaphylactic reaction

\*Potential manifestation in patients with allergy to corn, see section 4.4

*Adverse reactions* may be associated to the medicinal product(s) added to the solution; the nature of *the* additive will determine the likelihood of any other adverse reactions.

System Organ Class	Adverse reactions (Preferred Terms)
Metabolism and nutrition disorders	Hypervolaemia
Vascular disorders	Vein injury
	Thrombophlebitis superficial
General disorders and administration site conditions	Chills
	Pyrexia
	Application site infection
	Application site pain
	Application site reaction
	Injection site phlebitis
	Injection site extravasation

## 4.9 Overdose

Excess administration of 4.3% Dextrose and 0.18% saline solution can cause:

- Hyperglycaemia, adverse effects on water and electrolyte balance, and corresponding complications. For example, severe hyperglycaemia and severe dilutional hyponatraemia, and their complications, can be fatal.
- Hyponatraemia (which can lead to CNS manifestations, including seizures, coma, cerebral oedema and death).
- Fluid overload (which can lead to central and/or peripheral oedema).
- See also sections 4.4 and 4.8

When assessing an overdose, any additives in the solution must also be considered.

Clinically significant overdose of 4.3% Dextrose and 0.18% saline solution may therefore, constitute a medical emergency.

Interventions include discontinuation of administration, dose reduction, administration of insulin and other measures as indicated for the specific clinical constellation.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: "Electrolytes with Carbohydrates"



ATC code: B05BB02.

4.3% Dextrose and 0.18% saline solution is a hypotonic solution of sodium chloride and glucose.

The pharmacodynamic properties of this solution are those of its components (glucose, sodium and chloride).

Ions, such as sodium, circulate through the cell membrane, using various mechanisms of transport, among which is the sodium pump (Na-K-ATPase). Sodium plays an important role in neurotransmission and cardiac electrophysiology, and also in its renal metabolism.

Chloride is mainly an extracellular anion. Intracellular chloride is in high concentration in red blood cells and gastric mucosa. Reabsorption of chloride follows reabsorption of sodium.

Glucose is the principal source of energy in cellular metabolism.

## 5.2 Pharmacokinetic properties

The pharmacokinetic properties of this solution are those of its components (glucose, sodium, and chloride).

After injection of radiosodium ( $^{24}\text{Na}$ ), the half life is 11 to 13 days for 99% of the injected Na and one year for the remaining 1%. The distribution varies according to tissues: it is fast in muscles, liver, kidney, cartilage and skin; it is slow in erythrocytes and neurones; it is very slow in the bone. Sodium is predominantly excreted by the kidney, but (as described earlier) there is extensive renal reabsorption. Small amounts of sodium are lost in the faeces and sweat.

The two main metabolic pathways of glucose are gluconeogenesis (energy storage) and glycogenolysis (energy release). Glucose metabolism is regulated by insulin.

## 5.3 Preclinical safety data

The preclinical safety assessment of 4.3% Dextrose and 0.18% saline solution for infusion in animals is not relevant as sodium chloride and glucose are physiological constituents of the body and are covered by appropriate pharmacopoeial references.

## 6. PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Not Applicable

### 6.2 Incompatibilities

Incompatibility of the medicinal product to be added with the solution in the container must be assessed before addition.

In the absence of compatibility studies, this solution must not be mixed with other medicinal products.

The Instructions for Use of the medicinal product to be added must be consulted.

Before adding a drug, verify it is soluble and stable in water at the pH of 4.3% Dextrose and 0.18% saline solution (see section 3).

As guidance, the following medications are incompatible with the 4.3% Dextrose and 0.18% saline solution (non-exhaustive listing):

- Ampicillin sodium
- Mitomycin
- Erythromycin lactobionate
- Human insulin

Those additives known to be incompatible should not be used.

Because of the presence of glucose, 4.3% Dextrose and 0.18% saline solution should not be administered simultaneously with blood through the same administration set because of the possibility of pseudoagglutination or haemolysis.

### **6.3 Shelf life**

3 years

#### In-use shelf-life (Additives)

Chemical and physical stability of any additive medication at the pH of the 4.3% Dextrose and 0.18% saline solution in the container should be established prior to use.

From a microbiological point of view, the diluted product must be used immediately unless dilution has taken place in controlled and validated aseptic conditions. If not used immediately, in-use storage times and conditions are the responsibility of the user.

### **6.4 Special precautions for storage**

Store below 30°C.

### **6.5 Nature and contents of container <and special equipment for use, administration or implantation>**

500ml in a Low Density Polyethylene

### **6.6 Special precautions for disposal <and other handling>**

Use only if the solution is clear, without visible particles and if the container is undamaged.

Administer immediately following the insertion of infusion set.

Do not remove unit from overwrap until ready for use.

The inner bag maintains the sterility of the product.

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 the administration of the fluid from the secondary container is completed.

The solution should be administered with sterile equipment using an aseptic technique.

The equipment should be primed with the solution in order to prevent air entering the system.

Additives may be introduced before administration or during administration through the resealable medication port.

When additive is used, verify tonicity prior to parenteral administration. Thorough and careful aseptic mixing of any additive is mandatory. Solutions containing additives should be used immediately after preparation unless preparation has taken place in controlled and validated aseptic conditions.

Adding other medications or using an incorrect administration technique might cause the appearance of fever reactions due to the possible introduction of pyrogens. In case of an adverse reaction, infusion must be stopped immediately.

Discard after single use.

Discard any unused portion.

Do not reconnect partially used bags.

## **7. <APPLICANT/SUPPLIER>**

Name and address: Fidson Healthcare Plc, KM 38. Lagos-Abeokuta Expressway, Sango-Ota, Ogun State, Nigeria

Tel: +2348023067964

Fax: -

Email: info@fidson.com

**8. WHO PREQUALIFICATION REFERENCE NUMBER**

**Not applicable**

**9. DATE OF <PREQUALIFICATION> / <RENEWAL OF PREQUALIFICATION>**

Not applicable

**10. DATE OF REVISION OF THE TEXT**

First Version {November/2018}

**Reference list**

*[This list provides references to relevant WHO guidelines and to relevant literature and databases, in addition to the SmPC(s) of the innovator product(s). The list is compiled by WHO.]*

Detailed information on this medicinal product is available on PQTm's website (see: <http://www.who.int/prequal>).