**Approved Professional Information for DEXTROSE 20 % and 35 % FRESENIUS**

## SCHEDULING STATUS

S3

## 1. NAME OF THE MEDICINE

**DEXTROSE 20 % FRESENIUS** solution for infusion

**DEXTROSE 35 % FRESENIUS** solution for infusion

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

DEXTROSE 20 % FRESENIUS: Each 500 ml contains 100 g dextrose (anhydrous) (as dextrose monohydrate).

DEXTROSE 35 % FRESENIUS: Each 500 ml contains 175 g dextrose (anhydrous) (as dextrose monohydrate).

*Excipient with known effect:*

Contains sugar (dextrose).

For a full list of excipients, see section 6.1.

## 3. PHARMACEUTICAL FORM

Solution for infusion.

Clear, colourless to straw-coloured solution of anhydrous dextrose in water for injection.

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Conditions or disorders where hypertonic dextrose-containing solutions are indicated.

## 4.2 Posology and method of administration

### Posology

DEXTROSE 20 % and 35 % FRESENIUS solution is administered by slow intravenous infusion:

(a) After admixture with amino acid solutions, or

(b) After dilution with other compatible IV fluids.

Dosage should be adjusted to meet the requirements of each individual patient.

The maximum rate at which DEXTROSE 20 % and 35 % FRESENIUS solution can be infused without producing glycosuria is 0,5 g per kg of body mass per hour. About 95 % of the dextrose is retained when infused at a rate of 0,8 g/kg/h.

The dosage and constant infusion rate of intravenous DEXTROSE 20 % and 35 % FRESENIUS solution must be selected with caution in paediatric patients. 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 warrants such evaluation.

DEXTROSE 20 % and 35 % FRESENIUS solution should be inspected visually for particulate matter and discolouration prior to administration, whenever solution and container permit.

### Method of administration

DEXTROSE 20 % and 35 % FRESENIUS solution should be administered by the intravenous route; it should not be administered subcutaneously or intramuscularly. Except in the emergency treatment of severe hypoglycaemia, DEXTROSE 20 % and 35 % FRESENIUS solution should be administered via a central vein.

Care should be exercised to ensure that the needle (or catheter) is well within the lumen of the vein and that extravasation does not occur.

Do not administer DEXTROSE 20 % and 35 % FRESENIUS solution unless solution is clear, and container is undamaged. Discard unused portion.

The choice of a central or peripheral venous route of infusion should depend on the osmolarity of the final infusate. Solutions with greater than 5 % dextrose or with osmolarity of greater than or equal to 900 mOsm/l must be infused through a central catheter (see section 4.4).

*Paediatric use*

The safety and effectiveness of DEXTROSE 20 % and 35 % FRESENIUS solution in the paediatric population are based on the similarity of the clinical conditions of the paediatric and adult populations.

Frequent monitoring of serum dextrose concentration is required when DEXTROSE 20 % and 35 % FRESENIUS solution is prescribed to paediatric patients. Infusion of hypertonic dextrose solution should not be used in neonates.

## 4.3 Contraindications

DEXTROSE 20 % and 35 % FRESENIUS solution is contraindicated in patients with:

- hypersensitivity to the active substance or to any excipients listed in section 6.1, or known allergy to maize or maize products
- anuria
- intracranial or intraspinal haemorrhage
- ischaemic stroke
- delirium tremens where there is dehydration
- glucose-galactose malabsorption syndrome
- hyperglycaemic coma.

## 4.4 Special warnings and precautions for use

DEXTROSE 20 % and 35 % FRESENIUS solution should be administered only after suitable dilution. DEXTROSE 20 % and 35 % FRESENIUS solution should be given slowly.

Significant hyperglycaemia and possible hyperosmolar syndrome may result from too rapid administration. The symptoms of hyperosmolar syndrome include mental confusion and loss of consciousness, especially in patients with chronic uraemia and those with known carbohydrate intolerance.

The intravenous administration of DEXTROSE 20 % and 35 % FRESENIUS solution can cause fluid and/or solute overloading resulting in dilution of serum electrolyte concentrations, overhydration, congested states or pulmonary oedema. DEXTROSE 20 % and 35 % FRESENIUS solution should be used with caution in patients with diabetes mellitus, as rapid infusion can lead to hyperglycaemia, as well as in those with malnutrition, thiamine deficiency, carbohydrate intolerance, sepsis, shock, or trauma.

**For peripheral vein administration:**

DEXTROSE 20 % and 35 % FRESENIUS solution should be given slowly, preferably through a small-bore catheter into a large vein, to minimise venous irritation.

**For central venous administration:**

DEXTROSE 20 % and 35 % FRESENIUS solution should be administered via a central vein after appropriate admixture or dilution when required.

Prolonged use in parenteral nutrition may affect insulin production; therefore, blood and urine glucose should be monitored.

DEXTROSE 20 % and 35 % FRESENIUS solution intravenous infusion is a hypertonic solution (*in vitro*, in a container). In the body, however, dextrose-containing fluids can become extremely physiologically hypotonic due to rapid glucose metabolism (see section 4.2 and 5.2).

Depending on the tonicity of the solution, the volume and rate of infusion and depending on a patient's underlying clinical condition and capability to metabolise glucose, intravenous administration of DEXTROSE 20 % and 35 % FRESENIUS solution can cause electrolyte disturbances, most importantly hypo- or hyperosmotic hyponatraemia.

***Hyponatraemia:***

Patients with non-osmotic vasopressin release (e.g., in acute illness, pain, post-operative stress, infections, burns and central nervous system (CNS) disease), patients with heart -, liver - and kidney diseases and patients exposed to vasopressin agonists (see section 4.5) are at risk of acute hyponatraemia upon infusion of hypotonic fluids.

Acute hyponatraemia can lead to acute hyponatraemic encephalopathy (brain oedema) characterised by headache, nausea, seizures, lethargy, and vomiting. Patients with brain oedema are at particular risk of severe, irreversible, and life-threatening brain injury.

Children, women of childbearing potential and patients with reduced cerebral compliance (e.g., meningitis, intracranial bleeding, and cerebral contusion) are at particular risk of the severe and life-threatening brain swelling caused by acute hyponatraemia.

Intravenous administration of DEXTROSE 20 % and 35 % FRESENIUS solution may result in other electrolyte disturbances, such as hypokalaemia, hypophosphataemia and hypomagnesaemia (see sections 4.2 and 4.8).

Special care should be taken during injection to avoid leakage into the surrounding tissue.

Electrolyte deficits, particularly serum potassium and phosphate, may occur during prolonged use of concentrated DEXTROSE 20 % and 35 % FRESENIUS solution. Blood electrolyte monitoring is essential, and fluid and electrolyte imbalances should be corrected. Essential vitamins and minerals also should be provided as needed. To minimise hyperglycaemia and

consequent glycosuria, it is desirable to monitor blood and urine glucose and if necessary, add insulin.

When DEXTROSE 20 % and 35 % FRESENIUS is abruptly withdrawn, it is advisable to follow with the administration of 5 % or 10 % dextrose solutions to avoid rebound hypoglycaemia.

DEXTROSE 20 % and 35 % FRESENIUS solution should be used with caution in patients with known subclinical or overt diabetes mellitus.

## 4.5 Interaction with other medicines and other forms of interaction

DEXTROSE 20 % and 35 % FRESENIUS solution should not be given through the same infusion equipment as whole blood as haemodialysis and clumping can occur (see section 6.2).

Additives may be incompatible. Consult with pharmacist, if available.

When introducing additives, use the aseptic technique, mix thoroughly, and do not store. The effects of insulin are reversed by glucose.

Medicines increasing the vasopressin effect, listed below, lead to reduced renal electrolyte free water excretion and increase the risk of hospital- acquired hyponatraemia following inappropriately balanced treatment with IV fluids (see sections 4.2, 4.4 and 4.8):

- medicines stimulating vasopressin release, e.g., carbamazepine, vincristine, selective serotonin reuptake inhibitors, 3,4-methylenedioxy-*N*-methamphetamine, ifosfamide, antipsychotics, narcotics
- medicines potentiating vasopressin action, e.g., NSAIDs (nonsteroidal anti-inflammatory drugs), cyclophosphamide
- vasopressin analogues, e.g., desmopressin, oxytocin, vasopressin, terlipressin.

Other medicines increasing the risk of hyponatraemia also include diuretics in general and antiepileptics such as oxcarbazepine.

## 4.6 Fertility, pregnancy and lactation

Safety in pregnancy and lactation has not been established.

DEXTROSE 20 % and 35 % FRESENIUS solutions are commonly used as hydrating fluids and as vehicles for other medicines. If given during labour to the mother, it may lead to foetal hyperglycaemia, hyperinsulinaemia, and acidosis, with subsequent neonatal hypoglycaemia and jaundice.

There is no, or inadequate evidence of safety of the use of intravenous glucose in human pregnancy, but it has been in wide use for many years without apparent harmful consequence. Intravenous glucose may result in foetal insulin production, with an associated risk of rebound hypoglycaemia in the neonate. Infusions of glucose administered during Caesarean section and labour should be used with caution and should not exceed 5 – 10 g glucose/hour.

DEXTROSE 20 % and 35 % FRESENIUS solution should be administered with special caution to pregnant women during labour, particularly if administered in combination with oxytocin, due to the risk of hyponatraemia (see sections 4.4, 4.5 and 4.8).

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

None known.

### 4.8 Undesirable effects

| **System organ class (SOC)** | **Adverse reaction (MedDRA term)** | **Frequency** |
|---|---|---|
| Infections and infestations | Infection at the site of injection | Not known*** |
| Metabolism and nutrition disorders | Hospital-acquired hyponatraemia*, hyperglycaemia**, hypokalaemia, hypophosphataemia, | |

| | | |
|---|---|---|
| | hypomagnesaemia, fluid, and electrolyte imbalance | |
| Nervous system disorders | Hyponatraemic encephalopathy* | Not known |
| General disorders and administration site conditions | Pain at the injection site, vein irritation, thrombophlebitis, venous thrombosis, phlebitis (extending from the site of injection), extravasation, hypovolaemia, tissue necrosis (if extravasation occurs) | Not known |

* Hospital-acquired hyponatraemia may cause irreversible brain injury and death due to development of acute hyponatraemic encephalopathy (see sections 4.2 and 4.4).

** Hyperglycaemia (possibly indicated by mental confusion or loss of consciousness) and glycosuria may occur as a result of the rate of administration or metabolic insufficiency. If undetected and untreated hyperglycaemia can lead to dehydration, hyperosmolar coma, and death.

*** Frequency unknown cannot be estimated from the available data.

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.

Prolonged or rapid infusion of large volumes of hyperosmotic solutions may result in dehydration as a consequence of the induced hyperglycaemia.

The administration of DEXTROSE 20 % and 35 % FRESENIUS solution without adequate levels of thiamine may precipitate overt deficiency states, e.g., Wernicke's encephalopathy.

Sodium retention, oedema, pulmonary oedema and congestive heart failure may be induced in patients with severe under-nutrition.

**Reporting of suspected adverse reactions**

Reporting suspected adverse reactions after authorisation of DEXTROSE 20 % and 35 % FRESENIUS is important. It allows continued monitoring of the benefit/risk balance of DEXTROSE 20 % and 35 % FRESENIUS. Health care providers are asked to report any suspected adverse reactions to SAHPRA via the "6.04 Adverse Drug Reactions Reporting Form", found online under SAHPRA's publications: http://www.sahpra.org.za/Publications/Index/8.

Health care providers are asked to report any suspected adverse drug reactions to the Holder of the Certificate of Registration at the following email address: safety.fksa@fresenius-kabi.com and to the relevant medicine's regulatory authority in the country where the product is marketed.

### 4.9 Overdose

In the event of overhydration or solute overload during therapy, re-evaluate the patient and institute appropriate corrective measures (see section 4.4).

Overdose of DEXTROSE 20 % and 35 % FRESENIUS solution may lead to hyperglycaemia and glycosuria leading to dehydration, hyperosmolar coma, and death. The blood levels of glucose can be reduced by slow infusion of insulin. Careful monitoring of blood glucose levels would be necessary.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

**Category and class:** A 24 Mineral substitutes, electrolytes, and trace elements.

Pharmacotherapeutic group: Carbohydrate-containing solution for parenteral nutrition.

ATC code: B05BA03.

When administered intravenously, solutions containing carbohydrate in the form of dextrose restore blood glucose level and provide calories.

The metabolism of glucose is an energy source for the body.

### 5.2 Pharmacokinetic properties

Dextrose is rapidly metabolised into carbon dioxide and water.

## 6. PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Hydrochloric acid (for pH-adjustment)

Water for injection.

### 6.2 Incompatibilities

DEXTROSE 20 % and 35 % FRESENIUS solution should not be administered concomitantly with blood through the same infusion set, because of the possibilities of agglomeration (see section 4.5).

### 6.3 Shelf life

24 months

### 6.4 Special precautions for storage

Store at or below 25 °C.

### 6.5 Nature and contents of container

500 ml & 1 000 ml PVC/Freeflex bag.

Not all pack sizes may be marketed.

### 6.6 Special precautions for disposal

No special requirements.

## 7. HOLDER OF CERTIFICATE OF REGISTRATION

Fresenius Kabi Manufacturing SA (Pty) Ltd

6 Gibaud Road

Korsten 6020

Gqeberha

South Africa

## 8. REGISTRATION NUMBERS

DEXTROSE 20 % FRESENIUS: L/24/329

DEXTROSE 35 % FRESENIUS: 29/24/0559

## 9. DATES OF FIRST AUTHORISATION

DEXTROSE 20 % FRESENIUS: 8 October 1979

DEXTROSE 35 % FRESENIUS: 15 June 1995

## 10. DATE OF REVISION OF THE TEXT

11 November 2022