



HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use **DEXTROSE AND SODIUM CHLORIDE INJECTION** safely and effectively. See full prescribing information for **DEXTROSE AND SODIUM CHLORIDE INJECTION**.

DEXTROSE AND SODIUM CHLORIDE injection, for intravenous use
Initial U.S. Approval: 1970

-----RECENT MAJOR CHANGES-----

Contraindications (4)	08/2019
Warnings and Precautions (5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7)	08/2019

-----INDICATIONS AND USAGE-----

2.5% Dextrose and 0.45% Sodium Chloride Injection is indicated as a source of water, electrolytes and calories. (1)

-----DOSAGE AND ADMINISTRATION-----

- Only for intravenous infusion. (2.1)
- See full prescribing information for information on preparation, administration, dosing considerations and instructions for use. (2.1, 2.2, 2.3)

---DOSAGE FORMS AND STRENGTHS---

2.5% Dextrose and 0.45% Sodium Chloride Injection is a clear solution in 1000 mL single dose, flexible containers. (3)

-----CONTRAINDICATIONS-----

- Known hypersensitivity to dextrose, or sodium chloride (4, 5.1)
- Clinically significant hyperglycemia (4, 5.2)

-----WARNINGS AND PRECAUTIONS-----

- Hypersensitivity Reactions: Monitor for signs and symptoms and discontinue infusion if reactions occur. (5.1)

- Hyperglycemia or Hyperosmolar Hyperglycemic State: Monitor blood glucose and administer insulin as needed. (5.2, 8.4)
- Hyponatremia, Hypokalemia, Hypernatremia and Hyperchloremia: Avoid in patients with or at risk for hypo-/hypernatremia and hypokalemia. If use cannot be avoided, monitor serum sodium and potassium concentrations. (5.3, 5.4, 5.5, 8.4)
- Fluid Overload: Avoid in patients with or at risk for fluid and/or solute overloading. If use cannot be avoided, monitor daily fluid balance and electrolyte, concentrations and acid-base balance, as needed and especially during prolonged use. (5.6)
- Refeeding Syndrome: Monitor severely undernourished patients and slowly increase nutrient intake. (5.7)

-----ADVERSE REACTIONS-----

Adverse reactions include electrolyte imbalances, hyperglycemia, and hypervolemia and injection site reactions. (6)

To report SUSPECTED ADVERSE REACTIONS, contact Fresenius Kabi USA, LLC at 1-800-551-7176 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

-----DRUG INTERACTIONS-----

- Other Products that Affect Glycemic Control, Vasopressin or Fluid and/or Electrolyte Balance: Monitor blood glucose concentrations, fluid balance serum electrolyte concentrations and acid-base balance. (7.1)
- Lithium: Decreased lithium concentrations with concomitant use; monitor serum lithium concentrations. (7.2)

See 17 for PATIENT COUNSELING INFORMATION.

Revised: 04/2020

**FULL PRESCRIBING INFORMATION:
CONTENTS***

1 INDICATIONS AND USAGE

2 DOSAGE AND ADMINISTRATION

- 2.1 Important Administration Instructions
- 2.2 Recommended Dosage
- 2.3 Instructions for Use

3 DOSAGE FORMS AND STRENGTHS

4 CONTRAINDICATIONS

5 WARNINGS AND PRECAUTIONS

- 5.1 Hypersensitivity Reactions
- 5.2 Hyperglycemia and Hyperosmolar Hyperglycemic State
- 5.3 Hyponatremia
- 5.4 Hypokalemia
- 5.5 Hyponatremia and Hyperchloremia
- 5.6 Fluid Overload
- 5.7 Refeeding Syndrome

6 ADVERSE REACTIONS

7 DRUG INTERACTIONS

- 7.1 Other Products that Affect Glycemic Control, Vasopressin or Fluid and/or Electrolyte Balance
- 7.2 Lithium

8 USE IN SPECIFIC POPULATIONS

- 8.1 Pregnancy
- 8.2 Lactation
- 8.4 Pediatric Use
- 8.5 Geriatric Use
- 8.6 Renal Impairment

10 OVERDOSAGE

11 DESCRIPTION

12 CLINICAL PHARMACOLOGY

- 12.1 Mechanism of Action

16 HOW SUPPLIED/STORAGE AND HANDLING

17 PATIENT COUNSELING INFORMATION

* Sections or subsections omitted from the full prescribing information are not listed.

FULL PRESCRIBING INFORMATION

1 INDICATIONS AND USAGE

2.5% Dextrose and 0.45% Sodium Chloride Injection is indicated as a source of water, electrolytes and calories.

2 DOSAGE AND ADMINISTRATION

2.1 Important Administration Instructions

- 2.5% Dextrose and 0.45% Sodium Chloride Injection is only for intravenous infusion.
- The osmolality of 2.5% Dextrose and 0.45% Sodium Chloride Injection, is 280 mOsmol/L (calc). Peripheral administration is generally acceptable; however, consider central vein administration if there is peripheral vein irritation, phlebitis, and/or associated pain.
- Do not administer 2.5% Dextrose and 0.45% Sodium Chloride Injection simultaneously with blood products through the same administration set because of the possibility of pseudo-agglutination or hemolysis.
- To prevent air embolism, use a non-vented infusion set or close the vent on a vented set, avoid multiple connections, do not connect flexible containers in series, fully evacuate residual gas in the container prior to administration, do not pressurize the flexible container to increase flow rates, and if administration is controlled by a pumping device, turn off pump before the container runs dry.
- Prior to infusion, visually inspect the solution for particulate matter. The solution should be clear and there should be no precipitates. Do not administer unless solution is clear and container is undamaged.
- Use of a final filter is recommended during administration of parenteral solutions, where possible.

2.2 Recommended Dosage

The choice of the specific, sodium chloride, and dextrose concentrations, rate and volume depends on the age, weight, clinical and metabolic conditions of the patient and concomitant therapy. Electrolyte supplementation may be indicated according to the clinical needs of the patient.

The administration rate should be governed, especially for premature infants with low birth weight, during the first few days of therapy, by the patient's tolerance to dextrose. Increase the infusion rate gradually as indicated by frequent monitoring of blood glucose concentrations [see *Warnings and Precautions (5.2), Use in Specific Populations (8.4)*].

2.3 Instructions for Use

- Check flexible container solution composition, lot number, and expiry date.
- Do not remove solution container from its overwrap until immediately before use.
- Use sterile equipment and aseptic technique.

Flexible Plastic Container (**freeflex**[®] bag)

To Open

1. Turn solution container over so that the text is face down. Using the pre-cut corner tabs, peel open the overwrap and remove solution container.
 2. Check the solution container for leaks by squeezing firmly. If leaks are found, or if the seal is not intact, discard the solution.
-
-

-
-
3. Check to ensure the solution is clear and there are no precipitates. Discard if there is a color change and/or the appearance of precipitates.

Preparation for Administration

1. Immediately before inserting the infusion set, break off BLUE Infusion Port Cap with the arrow pointing away from container.
2. Use a non-vented infusion set or close the air-inlet on a vented set.
3. Close the roller clamp of the infusion set.
4. Hold the base of BLUE Infusion Port.
5. Insert spike through BLUE Infusion Port by rotating wrist slightly until the spike is inserted.
NOTE: See full directions accompanying administration set.
6. Suspend solution container from hanger hole.

To Add Medication

- Additives may be incompatible. Complete information is not available. Do not use additives known or determined to be incompatible.
- Consult with pharmacist, if available. If, in the informed judgment of the healthcare provider, it is deemed advisable to introduce additives, use aseptic technique.
- When introducing additives, consult the instructions for use of the medication to be added and other relevant literature.
- Before adding a substance or medication, verify that it is soluble and/or stable in this drug product and that the pH range of this drug product is appropriate.

To Add Medication Prior to Solution Administration

1. Identify WHITE Additive Port with arrow pointing toward container.
2. Immediately before injecting additives, break off WHITE Additive Port Cap with the arrow pointing toward container.
3. Hold base of WHITE Additive Port horizontally.
4. Prepare medication site
5. Insert an 18 to 23 gauge needle horizontally through the center of WHITE Additive Port's septum and inject additives.
6. Mix container contents thoroughly.
For high density medication such as potassium chloride, squeeze ports while ports are upright and mix thoroughly.
7. After addition, check to ensure the solution is clear and there are no precipitates. Discard if there is a color change and/or the appearance of precipitates.

To Add Medication During Solution Administration

1. Close the clamp on the set
 2. Identify WHITE Additive Port with arrow pointing toward container
 3. Immediately before injecting additives, if the Cap has not been broken off, break off WHITE Additive Port cap with the arrow pointing toward container.
 4. Hold base of WHITE Additive Port horizontally.
 5. Prepare medication site.
 6. Using a syringe with an 18 to 23 gauge needle, horizontally insert through the center of WHITE Additive Port's septum and inject additives.
 7. Remove container from IV pole and/or turn to an upright position.
 8. Mix container contents thoroughly.
-
-

-
-
9. After addition, check to ensure the solution is clear and there are no precipitates. Discard if there is a color change and/or the appearance of precipitates.
 10. Using aseptic technique, repeat steps 4-7 as necessary.
 11. Return container to in use position and continue administration.

Storage

- Use promptly; do not store solutions containing additives.
- Single-dose container.
- Discard any unused portion.

3 DOSAGE FORMS AND STRENGTHS

2.5% Dextrose and 0.45% Sodium Chloride Injection is a clear solution in 1000 mL single dose, flexible containers.

4 CONTRAINDICATIONS

2.5% Dextrose and 0.45% Sodium Chloride Injection is contraindicated in patients with:

- known hypersensitivity to dextrose and/or sodium chloride [see *Warnings and Precautions* 5.1]
- clinically significant hyperglycemia [see *Warnings and Precautions* (5.2)]

5 WARNINGS AND PRECAUTIONS

5.1 Hypersensitivity Reactions

Hypersensitivity and infusion reactions, including anaphylaxis, have been reported with 2.5% Dextrose and 0.45% Sodium Chloride Injection [see *Adverse Reactions* (6)]. Stop the infusion immediately if signs or symptoms of a hypersensitivity or infusion reaction develops [see *Contraindications* (4)]. Appropriate therapeutic countermeasures must be instituted as clinically indicated.

5.2 Hyperglycemia and Hyperosmolar Hyperglycemic State

The use of dextrose infusions in patients with impaired glucose tolerance may worsen hyperglycemia. Administration of dextrose at a rate exceeding the patient's utilization rate may lead to hyperglycemia, coma, and death.

Hyperglycemia is associated with an increase in serum osmolality, resulting in osmotic diuresis, dehydration and electrolyte losses. Patients with underlying central nervous system disease and renal impairment who receive dextrose infusions, may be at greater risk of developing hyperosmolar hyperglycemic state.

Monitor blood glucose concentrations and treat hyperglycemia to maintain concentrations within normal limits while administering 2.5% Dextrose and 0.45% Sodium Chloride Injection.

Insulin may be administered or adjusted to maintain optimal blood glucose concentrations.

5.3 Hyponatremia

2.5% Dextrose and 0.45% Sodium Chloride Injection is a hypertonic solution [see *Description, Table 1 (11)*]. In the body, however, glucose containing fluids can become extremely physiologically hypotonic due to rapid glucose metabolization. Monitoring of serum sodium is particularly

important for hypotonic fluids.

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 metabolize glucose, intravenous administration of glucose can cause electrolyte disturbances, most importantly hypo- or hyperosmotic hyponatremia.

The risk for hyponatremia is increased, in pediatric patients, elderly patients, postoperative patients, those with psychogenic polydipsia and in patients treated with medications that increase the risk of hyponatremia (such as certain diuretic, antiepileptic and psychotropic medications) [see *Drug Interactions (7.1)*].

Acute hyponatremia can lead to acute hyponatremic encephalopathy characterized by headache, nausea, seizures, lethargy and vomiting. Patients with brain edema are at particular risk of severe, irreversible and life-threatening brain injury. Patients at increased risk for developing complications of hyponatremia, such as hyponatremic encephalopathy include pediatric patients; women, in particular, premenopausal women; patients with hypoxemia; and in patients with underlying central nervous system disease [see *Use in Specific Populations (8.4, 8.5)*].

Avoid 2.5% Dextrose and 0.45% Sodium Chloride Injection in patients with or at risk for hyponatremia. If use cannot be avoided, monitor serum sodium concentrations.

Rapid correction of hyponatremia is potentially dangerous with risk of serious neurologic complications such as osmotic demyelination syndrome with risk of seizures and cerebral edema. To avoid complications, monitor serum sodium and chloride concentrations, fluid status, acid-base balance, and signs of neurologic complications.

High volume infusion must be used with close monitoring in patients with cardiac or pulmonary failure, and in patients with non-osmotic vasopressin release (including SIADH), due to the risk of hospital-acquired hyponatremia.

5.4 Hypokalemia

Excessive administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection may result in significant hypokalemia. Hypokalemic periodic paralysis, metabolic alkalosis, increased gastrointestinal losses (e.g. diarrhea, vomiting), prolonged low potassium diet, or primary hyperaldosteronism may increase the risk of hypokalemia. Avoid the administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection in patients with or at risk of hypokalemia or taking medications that may increase the risk. If use cannot be avoided, monitor serum potassium levels.

5.5 Hypernatremia and Hyperchloremia

Electrolyte imbalances such as hypernatremia and hyperchloremia, leading to metabolic acidosis may occur with solutions containing 0.9% sodium chloride.

Conditions that may increase the risk of hypernatremia, fluid overload and edema (central and peripheral), include patients with pre-eclampsia, primary hyperaldosteronism and secondary hyperaldosteronism associated with, for example, hypertension, congestive heart failure, severe renal impairment, liver disease (including cirrhosis), and renal disease (including renal artery stenosis, nephrosclerosis).

Medications such as corticosteroids or corticotropin, may increase the risk of sodium and fluid retention.

Avoid in patients with or at risk for hypernatremia. If use cannot be avoided, monitor serum

sodium concentrations.

Rapid correction of hypernatremia is potentially dangerous with risk of serious neurologic complications. Excessively rapid correction of hypernatremia is also associated with a risk for serious neurologic complications such as osmotic demyelination syndrome (ODS) with risk of seizures and cerebral edema.

5.6 Fluid Overload

Depending on the volume and rate of infusion, the patient's underlying clinical condition and capability to metabolize dextrose, intravenous administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection can cause fluid and/or solute overloading resulting in dilution of serum electrolyte concentrations, overhydration, congested states or pulmonary edema.

Avoid 2.5% Dextrose and 0.45% Sodium Chloride Injection in patients with or at risk for fluid and/or solute overloading. If use cannot be avoided, monitor fluid balance, electrolyte concentrations, and acid-base balance as needed and especially during prolonged use.

5.7 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. To prevent these complications, monitor severely undernourished patients and slowly increasing nutrient intake.

6 ADVERSE REACTIONS

The following adverse reactions associated with the use of 2.5% Dextrose and 0.45% Sodium Chloride Injection were identified in postmarketing reports. Because these reactions were reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

The following clinically significant adverse reactions are described elsewhere in the labeling:

- *Hypersensitivity Reactions*: anaphylaxis, rash and pruritus [see *Warnings and Precautions (5.1)*].
- *Metabolism and Nutrition Disorders*: hyperglycemia [see *Warnings and Precautions (5.2)*], hyponatremia and hyponatremic encephalopathy, for solutions containing less than 0.9% sodium chloride [see *Warnings and Precautions (5.3)*]. Hypernatremia and hyperchloremia acidosis [see *Warnings and Precautions (5.5)*] have been observed in solutions containing 0.9% sodium chloride.
- *Infusion and/or Injection Site Reactions*: phlebitis, injection site vesicles, infusion site pain, chills and pyrexia.

7 DRUG INTERACTIONS

7.1 Other Products that Affect Glycemic Control, Vasopressin or Fluid and/or Electrolyte Balance

2.5% Dextrose and 0.45% Sodium Chloride Injection can affect glycemic control, vasopressin and fluid and/or electrolyte balance [see *Warnings and Precautions (5.2, 5.3, 5.4, 5.5, 5.6)*]. Monitor blood glucose concentrations, fluid balance, serum electrolyte concentrations and acid-base balance when using 2.5% Dextrose and 0.45% Sodium Chloride Injection in patients

treated with other substances that affect glycemic control, vasopressin or fluid and/or electrolyte balance.

7.2 Lithium

Renal sodium and lithium clearance may be increased during administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection resulting in decreased serum lithium concentrations. Monitor serum lithium concentrations during concomitant use.

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Appropriate administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection during pregnancy is not expected to cause adverse developmental outcomes, including congenital malformations. Animal reproduction studies have not been conducted with 2.5% Dextrose and 0.45% Sodium Chloride Injection.

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. All pregnancies have a background risk of birth defect, loss, or other adverse outcomes. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2 to 4% and 15 to 20%, respectively.

8.2 Lactation

Risk Summary

Sodium is present in human breast milk. There are no data on the effects of 2.5% Dextrose and 0.45% Sodium Chloride Injection on a breastfed infant or the effects on milk production.

The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for 2.5% Dextrose and 0.45% Sodium Chloride Injection and any potential adverse effects on the breastfed infant from 2.5% Dextrose and 0.45% Sodium Chloride Injection or from the underlying maternal condition.

8.4 Pediatric Use

The safety profile of 2.5% Dextrose and 0.45% Sodium Chloride Injection in pediatric patients is similar to adults.

Neonates, especially premature infants with low birth weight, are at increased risk of developing hypo- or hyperglycemia and therefore need close monitoring during treatment with intravenous glucose solutions to ensure adequate glycemic control in order to avoid potential long-term adverse effects.

Closely monitor plasma electrolyte concentrations in pediatric patients who may have impaired ability to regulate fluids and electrolytes. In very low birth weight infants, excessive or rapid administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection may result in increased serum osmolality and risk of intracerebral hemorrhage.

Children (including neonates and older children) are at increased risk of developing hyponatremia as well as for developing hyponatremic encephalopathy.

8.5 Geriatric Use

Clinical studies of 2.5% Dextrose and 0.45% Sodium Chloride Injection did not include sufficient

numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects.

Elderly patients are at increased risk of developing hyponatremia as well as for developing hyponatremic encephalopathy [see *Warnings and Precautions (5.3)*]. 2.5% Dextrose and 0.45% Sodium Chloride Injection is known to be substantially excreted by the kidney, and the risk of adverse reactions to this product may be greater in patients with impaired renal function [see *Warnings and Precautions (5.2, 5.5)*].

Dose selection for an elderly patient should be cautious, 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 other drug therapy.

8.6 Renal Impairment

Administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection in patients with renal impairment may result in hyperosmolar hyperglycemic state, hyponatremia, and/or fluid overload. Monitor patients with renal impairment for development of these adverse reactions [see *Warnings and Precautions (5.2, 5.3, 5.5, 5.6)*].

10 OVERDOSAGE

Excessive administration of 2.5% Dextrose and 0.45% Sodium Chloride Injection can cause:

Electrolyte and Fluid Disorders

- Hyperglycemia, hyperosmolality, and adverse effects on water and electrolyte balance, and corresponding complications, which can be fatal [see *Warnings and Precautions (5.2)*].
- Hyponatremia, manifestations may include seizures, coma, cerebral edema and death) [see *Warnings and Precautions (5.3)*].
- Hypernatremia, especially in patients with severe renal impairment [see *Warnings and Precautions (5.5)*].
- Fluid overload (which can lead to central and/or peripheral edema) [see *Warnings and Precautions (5.6)*].

When assessing an overdose, any additives in the solution must also be considered. Clinically significant overdose of 2.5% Dextrose and 0.45% Sodium Chloride Injection may, therefore, constitute a medical emergency. The effects of an overdose may require immediate medical attention and treatment.

Interventions include discontinuation of the infusion, dose reduction, monitoring of fluid balance, electrolyte concentrations and acid-base balance and institution of appropriate corrective measures such as administration of exogenous insulin.

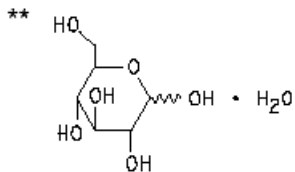
11 DESCRIPTION

2.5% Dextrose and 0.45% Sodium Chloride Injection, USP is a sterile, nonpyrogenic solution for fluid and electrolyte replenishment and caloric supply in single-dose containers for intravenous administration. It contains no antimicrobial agents. Composition, osmolality, pH, ionic concentration and caloric content are shown in Table 1.

Table 1.

	Size (mL)	Composition (g/L)		*Osmolarity (mOsmol/L) (calc.)	pH	Ionic Concentration (mEq/L)		Caloric Content (kcal/L)
		**Dextrose Hydrated, USP	Sodium Chloride, USP (NaCl)			Sodium	Chloride	
2.5% Dextrose and 0.45% Sodium Chloride Injection, USP	1,000	25	4.5	280	4.5 (3.2 to 6.5)	77	77	85

* Normal physiologic osmolarity range is approximately 280 to 310 mOsmol/L.



Dextrose is derived from corn.

The flexible plastic container is fabricated from a specially formulated non-plasticized, film containing polypropylene and thermoplastic elastomers (**freeflex**® bag). The amount of water that can permeate from the container into the overwrap is insufficient to affect the solution significantly. Solutions in contact with the flexible container can leach out certain of the container's chemical components in very small amounts within the expiration period. The suitability of the container material has been confirmed by tests in animals according to USP biological tests for plastic containers.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

2.5% Dextrose and 0.45% Sodium Chloride Injection is a source of water, electrolytes and calories. It is capable of inducing diuresis depending on the clinical condition of the patient.

16 HOW SUPPLIED/STORAGE AND HANDLING

2.5% Dextrose and 0.45% Sodium Chloride is a clear solution in 1000 mL single-dose, flexible containers available as follows:

Product Name	Size (mL)	Number per Carton	NDC	Product Code
2.5% Dextrose and 0.45% Sodium Chloride Injection, USP	1,000	10	63323-874-10	874010

Storage: Avoid excessive heat. Store at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature]; brief exposure up to 40°C/104°F does not adversely affect the product. The container closure is not made with natural rubber latex. Non-PVC, Non-DEHP, Sterile.

17 PATIENT COUNSELING INFORMATION

Inform patients, caregivers or home healthcare providers of the following risks of 2.5% Dextrose and 0.45% Sodium Chloride Injection:

- Hypersensitivity reactions [see *Warnings and Precautions* (5.1)]
- Hyperglycemia and hyperosmolar hyperglycemic state [see *Warnings and Precautions* (5.2)]
- Hyponatremia [see *Warnings and Precautions* (5.3)]

-
-
-
- Hypokalemia [see *Warnings and Precautions (5.4)*]
 - Hyponatremia and hyperchloremia [see *Warnings and Precautions (5.5)*]
 - Fluid overload [see *Warnings and Precautions (5.6)*]
 - Refeeding syndrome [see *Warnings and Precautions (5.7)*]

Manufactured for:



Lake Zurich, Illinois 60047

Made in Germany

451655A

www.fresenius-kabi.com/us

Revised: April 2020
