

## HIGHLIGHTS OF PRESCRIBING INFORMATION

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

DEXTROSE injection, for intravenous use

Initial U.S. Approval: 1940

### RECENT MAJOR CHANGES

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

### INDICATIONS AND USAGE

Dextrose Injection is indicated as a source of water 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

Injection:

- 5% (0.05 grams/mL): 5 grams of dextrose hydrous per 100 mL in single-dose partial-fill flexible containers: 250 mL, 500 mL, and 1000 mL. (3)

### CONTRAINDICATIONS

- Clinically significant hyperglycemia. (4)
- Known hypersensitivity to dextrose. (4)

### WARNINGS AND PRECAUTIONS

- Hyperglycemia or Hyperosmolar Hyperglycemic State:** Monitor blood glucose and administer insulin as needed. (5.1)
- Hypersensitivity Reactions:** Monitor for signs and symptoms and discontinue infusion if reactions occur. (5.2)

- Vein Damage and Thrombosis:** Consider central vein when administering more than 5% dextrose or with an osmolality of at least 900 mOsm/L or when there is peripheral vein irritation, phlebitis, and/or associated pain. (2.2, 5.3)
- Hyponatremia:** Avoid in patients with or at risk for hyponatremia. If use cannot be avoided, monitor serum sodium concentrations. (5.4)
- Electrolyte Imbalance and Fluid Overload:** Avoid in patients with or at risk for fluid and/or solute overloading. If use cannot be avoided, monitor daily fluid balance, electrolyte concentrations, and acid-base balance, as needed and especially during prolonged use. (5.5)
- Refeeding Syndrome:** Monitor severely undernourished patients and slowly increase nutrient intake. (5.6)

### ADVERSE REACTIONS

The most common adverse reactions are, hyperglycemia, hypersensitivity reactions, hyponatremia, infection both systemic and at the injection site, vein thrombosis or phlebitis, and electrolyte imbalance. (6)

To report SUSPECTED ADVERSE REACTIONS, contact Baxter Healthcare at 1-866-888-2472 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://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)

### USE IN SPECIFIC POPULATIONS

**Pediatric Use:** Increased risk of hypoglycemia/hyperglycemia; monitor serum glucose concentrations. (8.4)

See 17 for PATIENT COUNSELING INFORMATION.

Revised: 12/2023

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## **FULL PRESCRIBING INFORMATION**

### **1 INDICATIONS AND USAGE**

Dextrose Injection is indicated as source of water and calories.

### **2 DOSAGE AND ADMINISTRATION**

#### **2.1 Important Administration Instructions**

- Dextrose Injection is intended for intravenous use.
- Peripheral administration of 5% dextrose is generally acceptable, however, consider central vein when administering more than 5% dextrose or with an osmolarity of at least 900 mOsm/L or when there is peripheral vein irritation, phlebitis, and/or associated pain [*see Warnings and Precautions (5.3)*].
- Do not administer Dextrose Injection simultaneously with blood products through the same administration set because of the possibility of pseudoagglutination 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 diluted dextrose 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 dextrose concentration, 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 (5.1), Use in Specific Populations (8.4)*].

## **2.3 Instructions for Use**

### To Open

- Do not remove from overpouch until ready to use.
- Tear overwrap down side at slit and remove solution container. Small amounts of moisture may be found on the solution container from water permeating from inside the container. The amount of permeated water is insufficient to affect the solution significantly. If larger amounts of water are found, the container should be checked for tears or leaks.
- Visually inspect the container. Some opacity of the plastic due to moisture absorption during the sterilization process may be observed. This is normal and does not affect the solution quality or safety. The opacity will diminish gradually. Evaluate the following:
  - If the outlet port protector is damaged, detached, or not present, discard container.
  - 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, insoluble complexes or crystals.
  - Check for minute leaks by squeezing the inner bag firmly. If leaks are found, discard container.

### Preparation for Administration

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

### 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 Dextrose Injection and that the pH range of Dextrose Injection is appropriate.

#### *To Add Medication Before Solution Administration*

1. Prepare medication site.
2. Using syringe with 19 to 22 gauge 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.
4. 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, insoluble complexes or crystals.

#### *To Add Medication During Solution Administration*

1. Close clamp on the set.
2. Prepare medication site.
3. Using syringe with 19 to 22 gauge needle, puncture resealable medication port and inject.
4. Remove container from IV pole and/or 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. 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, insoluble complexes or crystals, do not use.
8. 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**

Dextrose Injection, USP is a clear, sterile, non-pyrogenic solution of dextrose in single-dose containers:

- 5% (0.05 grams/mL): 5 grams of dextrose hydrous per 100 mL in partial-fill flexible containers: 250 mL, 500 mL, and 1000 mL

### **4 CONTRAINDICATIONS**

The use of Dextrose Injection is contraindicated in patients with:

- Clinically significant hyperglycemia [*see Warnings and Precautions (5.1)*].
- Known hypersensitivity to dextrose [*see Warnings and Precautions (5.2)*].

### **5 WARNINGS AND PRECAUTIONS**

#### **5.1 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 [*see Warnings and Precautions (5.5)*].

Patients with underlying CNS disease and renal impairment who receive dextrose infusions, may be at greater risk of developing hyperosmolar hyperglycemic state.

Monitor blood glucose levels and treat hyperglycemia to maintain levels within normal limits while administering Dextrose Injection. Insulin may be administered or adjusted to maintain optimal blood glucose levels during Dextrose Injection administration.

#### **5.2 Hypersensitivity Reactions**

Hypersensitivity and infusion reactions, including anaphylaxis, have been reported with Dextrose Injection [*see Adverse Reactions (6)*]. Stop infusion immediately and treat patient accordingly if signs or symptoms of a hypersensitivity reaction develop.

Appropriate therapeutic countermeasures must be instituted as clinically indicated.

### 5.3 Vein Damage and Thrombosis

Peripheral administration of 5% Dextrose Injection is generally acceptable, however, consider central vein when administering more than 5% dextrose or with an osmolality of  $\geq$  at least 900 mOsm/L or when there is peripheral vein irritation, phlebitis, and/or associated pain [see *Dosage and Administration* (2. 1)]. The infusion of hypertonic solutions into a peripheral vein may result in vein irritation, vein damage, and/or thrombosis. The primary complication of peripheral access is venous thrombophlebitis, which manifests as pain, erythema, tenderness or a palpable cord. Remove the catheter as soon as possible, if thrombophlebitis develops.

### 5.4 Hyponatremia

5% Dextrose Injection is an isotonic solution [see *Description, Table 1 (11)*]. In the body, however, glucose containing fluids can become extremely physiologically hypotonic due to rapid glucose metabolism. 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. Monitor serum sodium to minimize the risk of 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 diuretics, certain antiepileptic and psychotropic medications). Close clinical monitoring may be warranted.

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 Dextrose 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. Brain adaptations reducing risk of cerebral edema make the brain vulnerable to injury when chronic hyponatremia is too rapidly corrected, which is known as osmotic demyelination syndrome (ODS). 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.

### **5.5 Electrolyte Imbalance and Fluid Overload**

Electrolyte deficits, particularly in serum potassium and phosphate, may occur during prolonged use of concentrated dextrose solutions.

Depending on the volume and rate of infusion, the patient's underlying clinical condition and capability to metabolize dextrose, intravenous administration of Dextrose Injection can cause fluid and/or solute overloading resulting in dilution of serum electrolyte concentrations, (including hypoosmotic hyponatremia), overhydration, congested states or pulmonary edema. The risk of dilutional states is inversely proportional to the electrolyte concentrations in the administered solution. The risk of solute overload causing congested states with peripheral and pulmonary edema is directly proportional to the electrolyte concentrations in the solution.

Avoid Dextrose Injection in patients with or at risk for fluid and/or solute overloading. If use cannot be avoided, monitor fluid balance, blood electrolyte levels, concentration of glucose, acid-base balance, correct fluid and electrolyte imbalances during prolonged parenteral therapy or whenever the condition of the patient or the rate of administration warrants such evaluation and acid-base balance as needed and especially during prolonged use. Additional monitoring is recommended for patients with water and electrolyte disturbances that could be aggravated by increased glucose, insulin administration and/or free water load. Patients at increased risk for developing hyponatremic encephalopathy include pediatric patients; elderly patients, women, in particular premenopausal women; patients with hypoxemia; and patients with underlying CNS disease [*see Use in Specific Populations (8.4, 8.5)*].

### **5.6 Refeeding Syndrome**

Refeeding severely undernourished patients may result in refeeding syndrome, characterized by the intracellular shift of potassium, phosphorus, and magnesium as the

patient becomes anabolic. Thiamine deficiency and fluid retention may also develop. To prevent these complications, monitor severely undernourished patients and slowly increase nutrient intake.

## **6 ADVERSE REACTIONS**

The following adverse reactions associated with the use of dextrose injection were identified in clinical trials or postmarketing reports. Because these reactions were reported voluntarily from a population of uncertain size, it is not always possible to estimate their frequency, reliably, or to establish a causal relationship to drug exposure.

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

- Hyperglycemia and hyperosmolar hyperglycemic state [*see Warnings and Precautions (5.1)*]
- *Hypersensitivity Reactions*: anaphylaxis, pruritis, bronchospasm, cyanosis, angioedema, hypotension, pyrexia, chills, and rash [*see Warnings and Precautions (5.2)*]
- *Infusion Site Reactions*: infusion site phlebitis, infusion site erythema, vein damage and thrombosis [*see Warnings and Precautions (5.3)*]
- Hyponatremia and hyponatremic encephalopathy [*see Warnings and Precautions (5.4)*]
- Electrolyte imbalance, fluid overload and hypervolemia [*see Warnings and Precautions (5.5)*]
- Refeeding syndrome [*see Warnings and Precautions (5.6)*]

## **7 DRUG INTERACTIONS**

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

Dextrose Injection can affect glycemic control, vasopressin and fluid and/or electrolyte balance [*see Warnings and Precautions (5.1, 5.4, 5.5)*]. Monitor blood glucose concentrations, fluid balance, serum electrolyte concentrations and acid-base balance when using Dextrose Injection in patients treated with other substances that affect glycemic control, vasopressin or fluid and/or electrolyte balance.



## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

#### Risk Summary

Appropriate administration of Dextrose Injection during pregnancy is not expected to cause adverse developmental outcomes, including congenital malformations. Animal reproduction studies have not been conducted with injectable dextrose solutions.

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

There are no data on the presence of dextrose in human milk, the effects on a breastfed infant, or the effects on milk production. The lack of clinical data during lactation precludes a clear determination of the risk of Dextrose Injection to an infant during lactation; therefore, the developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for Dextrose Injection and any potential adverse effects on the breastfed infant from Dextrose Injection or from the underlying maternal condition.

### **8.4 Pediatric Use**

The safety profile of Dextrose 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 infusions 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 Dextrose 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 [*see Warnings and Precautions (5.4)*].

### **8.5 Geriatric Use**

Clinical studies of Dextrose 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 (5.4)*]. 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 other drug therapy.

Dextrose is known to be substantially excreted by the kidney, and the risk of toxic reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function.

## **10 OVERDOSAGE**

An increased infusion rate of Dextrose Injection or administration of dextrose solutions can cause hyperglycemia, hyperosmolality, and adverse effects on water and electrolyte balance [*see Warnings and Precautions (5.1, 5.5)*].

Severe hyperglycemia and severe dilutional hyponatremia, and their complications, can be fatal. Discontinue infusion, reduce dose and institute appropriate corrective measures such as administration of exogenous insulin.

Discontinue infusion and institute appropriate corrective measures in the event of overhydration or solute overload during therapy, with particular attention to CNS, respiratory and cardiovascular systems.

If over-exposure occurs, call your Poison Control Center at 1-800-222-1222 for current information on the management of poisoning or overdosage.

## 11 DESCRIPTION

Dextrose Injection, USP is sterile, non-pyrogenic solutions of Dextrose, USP in Water for Injection in a flexible plastic container for intravenous administration as a source of water and calories.

Partial-fill containers, designed to facilitate admixture when necessary, are available in 250 mL, 500 mL, and 1000 mL sizes. See Table 1 for the content and characteristics of this solution.

The solution contains no bacteriostatic, antimicrobial agent or added buffer and is intended only for use as a single-dose injection. The pH range is 4.0 (3.2 to 6.5).

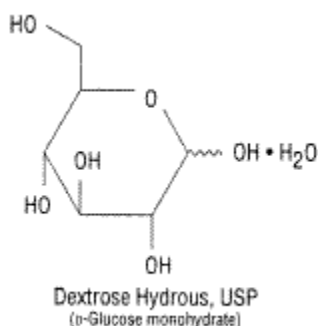
Water can permeate from inside the container into the overwrap but not in amounts sufficient to affect the solution significantly.

**Table 1. Contents and Characteristics of Dextrose Injection 5%, USP**

Strength	Fill Volume	Amount of Dextrose Hydrous per Container	kcal* per Container	Osmolarity (mOsmol per liter)
Dextrose Injection 5%, USP (0.05 grams/mL)	50 mL	2.5 grams	8.5	252
	100 mL	5 grams	17	252
	250 mL	12.5 grams	42.5	252
	500 mL	25 grams	85	252
	1000 mL	50 grams	170	252

\*Caloric value calculated on the basis of 3.4 kcal/g of dextrose, hydrous

Dextrose, USP is chemically designated D-glucose, monohydrate ( $C_6H_{12}O_6 \cdot H_2O$ ), a hexose sugar freely soluble in water. The molecular weight of dextrose (D-glucose) monohydrate is 198.17. It has the following structural formula:



Water for Injection, USP is chemically designated  $H_2O$ .

Dextrose is derived from corn.

VIAFLO is a flexible plastic container fabricated from a multilayer sheeting (PL-2442) composed of Polypropylene (PP), Polyamide (PA) and Polyethylene (PE). Two different administration connectors are available with VIAFLO containers. The VIAFLO dripless access container (DAC) will not drip once the spike is removed. The non-DAC VIAFLO will drip once the spike is removed from the administration port.

VIAFLO is not made with natural rubber latex, DEHP, or PVC.

## **12 CLINICAL PHARMACOLOGY**

### **12.1 Mechanism of Action**

Dextrose is oxidized to carbon dioxide and water, yielding energy.

## **16 HOW SUPPLIED/STORAGE AND HANDLING**

Dextrose Injection, USP are clear, colorless, sterile solutions of dextrose supplied in VIAFLO dripless access containers (DAC) and non-DAC plastic containers are shown below. VIAFLO DAC will not drip once the spike is removed. VIAFLO non-DAC will drip once the spike is removed from the administration port.

<b>Product Description</b>	<b>Size</b>	<b>Code</b>	<b>NDC</b>
Dextrose Injection 5%, USP (0.05 grams/mL)	50mL (DAC)	UE0086DG	0338-9651-75
	50mL (Non-DAC)	UE0086G	0338-9649-75
	100mL (DAC)	UE0087DG	0338-9655-60
	100mL (Non-DAC)	UE0087G	0338-9653-60
	250 mL (DAC)	UE0062D	0338-0062-30
	250 mL (Non-DAC)	UE0062	0338-0074-30
	500 mL (DAC)	UE0063D	0338-0066-20
	500 mL (Non-DAC)	UE0063	0338-0078-20
	1000 mL (DAC)	UE0064D	0338-0070-10
	1000 mL (Non-DAC)	UE0064	0338-0082-10

	1000mL (DAC)	UE0064DG	0338-0070-12
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Do not remove container from the overwrap until intended for use.

Use the product immediately after mixing and the introduction of additives.

Exposure of pharmaceutical products to heat should be minimized. Avoid excessive heat. It is recommended the product be stored at room temperature (25°C/77°F); brief exposure up to 40°C/104°F does not adversely affect the product.

## 17 PATIENT COUNSELING INFORMATION

Inform patients, caregivers, or home healthcare providers of the following risks of Dextrose Injection:

- Hyperglycemia and hyperosmolar hyperglycemic state *[see Warnings and Precautions (5.1)]*
- Hypersensitivity reactions *[see Warnings and Precautions (5.2)]*
- Vein damage and thrombosis *[see Warnings and Precautions (5.3)]*
- Hyponatremia *[see Warnings and Precautions (5.4)]*
- Electrolyte imbalance and fluid overload *[see Warnings and Precautions (5.5)]*
- Refeeding syndrome *[see Warnings and Precautions (5.6)]*

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