



UTSW/Parkland BioTel EMS System

Frequently Asked Questions: D10W for Symptomatic Hypoglycemia

1. What is the difference in the concentration of D10W versus D50W?

D10W has one-fifth (1/5) of the concentration of D50W. Therefore, it takes five times the volume of D10W to equal one ampule of D50W. So, a 250-mL bag of D10W has the same amount of dextrose (25 grams) as found in one, 50-mL ampule of D50W.

2. Is D10W safer than D50W?

Yes. The normal concentration of the blood, called osmolality, is around 300 milliosmoles per liter (mOsm/L). Human veins can withstand chemical concentrations of up to about 900 mOsm/L. The concentration of D50W is 2,525 mOsm/L, far exceeding the safety factor for the veins by almost 300%. The concentration of D10W is only 506 mOsm/L. So, using D10W is safer than D50W, especially if extravasation were to occur.¹ D10W is also less likely to cause thrombophlebitis in the vein. Literature suggests that any concentration of dextrose of 20% or greater should be administered into a central line.^{2,3} D10W for symptomatic hypoglycemia is not new – UK, Australia, other countries, and many U.S. EMS systems have been using D10W for years.^{2,4}

3. Aside from the local toxicity, can administering a full ampule of D50W cause other problems in the hypoglycemic patient?

Yes. D50W administration is more likely to cause the diabetic patient's blood sugar to spike to up to 5 times higher than normal (6-10 times normal in children). This is called "overshoot" and can cause many adverse effects, including hyperosmolar syndrome.

4. How do I administer D10W?

Start a peripheral IV (or IO) line, as you normally do. Hang either a 100-mL bag or a 250-mL bag. *The initial adult dose in the 2017 BioTel CPGs has not yet been finalized. For availability reasons, it most likely will be 12.5 g (half of a 250-mL bag),* administered over 10 minutes, and monitoring the patient for clinical response.

5. How much is enough IV Dextrose?

Enough to do the job!! The primary endpoint is the level of consciousness. A normal, repeat POC glucose analysis confirms that no additional dextrose is needed. Approximately 70-90% of adult patients should respond to an initial dose of 10 g or 12.5 g. Occasionally a second dose may be needed.^{2,5} Patients who do not wake up, despite a normal repeat POC glucose (who may have another cause of altered LOC), and those with a persistently low POC glucose despite two doses of IV dextrose should be transported.

6. What about Infants and Children?

Pending final review of the DRAFT 2017 BioTel CPGs, the initial dose for infants and children between 1 year and 13 years of age will be 5 mL/kg; the dose for neonates and for infants 1 month to 1 year of age will be 2 mL/kg. Patient response, repeat POC Glucose analysis, and a repeat dose, if needed, are the same as for adults.

Want to read more about it?

1. Levy SB, Rosh AJ. Images in emergency medicine. Dextrose extravasation causing skin necrosis. Ann Emerg Med 2006 Sept; 48(3):236, 239.
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2. Nehme Z. A review of the efficacy of 10% dextrose as an alternative to high concentration glucose in the treatment of out-of-hospital hypoglycemia. Journal of Emergency Primary Healthcare. Vol 5, Issue 3, 2009. [Available here](#)
3. Kuwahara T, Asanami S, Kubo S. Experimental infusion phlebitis: tolerance osmolality of peripheral venous endothelial cells. Nutrition 1998 Jun;14(6):496-501.
[PMID: 9646289](#)
4. Moore C, Woollard M. Dextrose 10% or 50% in the treatment of hypoglycaemia out of hospital? A randomised controlled trial. Emerg Med J 2005 Jul; 22(7):512-515.
[PMC1726850](#)
5. Wood SP. Is D50 too much of a good thing? A reappraisal of the safety of 50% dextrose administration in patients with hypoglycemia. Journal of Emergency Medical Services 2007;32(3):103-6.
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