

Pediatric DKA “Two Bag Method”

Basics & Background:

- Two liter bags of IV fluids containing electrolytes are hung simultaneously for hydration and electrolyte replacement and maintenance while insulin is infusing.
 - The major difference between IV bags: **one bag will contain dextrose**
 - The total rate of the two IV bags should equal the total desired maintenance fluid rate
 - As glucose levels fall with the administration of insulin, Bag 1 (without dextrose) will be titrated down and Bag 2 (contains dextrose) will be titrated up
- Use of the “Two Bag Method” does not hasten the time to resolution of ketoacidosis.¹ However, logistical benefits such as decreased response time for fluid order changes and a decrease in number of IV fluid bags used.¹⁻³

Logistics:

- EM or Pediatric providers will enter fluid orders for the “Two Bag Method” from the Pedi DKA orderset
- IV fluid bags will be verified by a pharmacist, compounded in the Main Pharmacy, and tubed to the proper tube station
- A calculator for IV fluid rates can be found on the EM Guidelines website. Open this file, enter the patient’s weight into the appropriate box, and the fluid rates will calculate. **These should match what has been entered in Epic**
- Each liter of IV fluid should run on its own pump (2 fluids + 1 insulin = 3 pumps)
- RNs may notify providers when IV fluid rate changes are indicated based on glucose values, but MDs are responsible for changing orders within Epic.

	Pediatric	Adult
Insulin Dose	0.1 units/kg/hour	0.14 units/kg/hour
Insulin Titration?	No	Yes
Fluids	Two bags titrated throughout protocol	One bag, contents may change based on electrolytes and phases
Usual Fluid Dispense Location	Main Pharmacy (IV Room)	Floorstock/Store Room
Phases of Protocol?	No	Yes

References:

1. Veverka M, Marsh K, Norman S, et al. A pediatric diabetic ketoacidosis management protocol incorporating a two-bag intravenous fluid system decreases duration of intravenous insulin therapy. *J Pediatr Pharmacol* 2016;21(6):512-517.
2. Poirier MP, Greer D, Satin-Smith M. A prospective study of the “Two-Bag System” in diabetic ketoacidosis management. *Clin Pediatr* 2004;43:809-13.
3. Grimberg A, Cerri RW, Satin-Smith M, et al. The “two bag system” for variable intravenous dextrose and fluid administration: Benefits in diabetic ketoacidosis management. *J Pediatr* 1999;134:376-8.

Pediatric New Onset Diabetes Mellitus Practice Guideline

All patients <18 years of age sent/presenting to ED with new-onset diabetes mellitus or suspected DKA



Triage identifies patient as ESI 2 and triggers patient to a care area



Nursing Interventions(not protocol orders, MD/Pa must order):

1. IV placed and labs drawn within 30 minutes of arrival.
2. Send urinalysis.
3. Normal Saline bolus at 10cc/kg
4. Water at the bedside for alert and oriented children who can safely drink (water only).

Physician Interventions:

1. Brief H&P
2. Utilize labs from Pedi diabetes/DKA set to get all labs needed
3. Consult with Pediatric Endocrinology Attending
4. STAT head CT if signs of cerebral edema



Venous pH <7.3 or bicarbonate <15 AND Plasma glucose

No

- Insulin to be ordered based on patient specific road map ask peds admission team to calculate. Goal is within one hour
- Cover carbohydrates using the road map if patient eats.
- BBCH inpatient

Yes

- See IVF in pedi DKA on ED Share point or EM guidelines.
- Contact PICU for admission

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