

DKA – Diabetic Ketoacidosis

Moderate DKA

pH 7.2-7.3
Bicarb > 10
+ Ketones
Blood Glucose > 250

Severe DKA

pH < 7.2
Bicarb < 10
+ Ketones
Blood Glucose > 250

Nursing Care Guidelines

Cardiac Monitoring

Bed rest

Strict I&O

* until Anion Gap closes & Ketones clear

Possible Lab/XR Evaluation

Oxygen

SaO₂ < 94%

Vital Signs

Stable: q 1^o
Unstable: q 15-30"
Stable: Neuro √ q 1^o
Unstable: q 15-30"

POCT Glucose

w/in 15 min of arrival
(even if glucose tested prior to arrival)
Accu √ q 1^o

Notify MD immediately if glucose changes > 100

- CBC, CMP, Mg²⁺, Phos, ABG or VBG
- HbA_{1c}, Serum Insulin
- UA, Serum Ketones/Urine Ketones
- CXR
- CT (STAT) for altered mental status (r/o cerebral edema.)

**obtain order prior to sending*

Cerebral Edema

- Unstable (GCS < 14): Neuro √ q 15 "
- Treatment options:
- ✓ Mannitol 0.5 gm/kg IV over 20"
- ✓ 3% Saline 5-10 ml/kg IV over 10-20"

MD/APN Notifications

- Change in GCS
 - ✓ GCS decreases (Δ in LOC)
 - ✓ Pupillary change
 - ✓ Complaint of headache
 - ✓ Vomiting
- Change in glucose
 - ✓ Change of Glucose > 100 mg/dL in 1 Hr
 - ✓ Glucose < 200 mg/dL
 - ✓ Sodium < 135 mmol/dL
 - ✓ Decrease in blood pH or VCO₂

Insulin infusion

- Humulin Reg 250 units/ 250 ml of NS
 - Rate: 0.05 - 0.1 units/kg/hr
 - Do NOT stop until Ketones clear & Gap closes.
- **Dextrose will be titrated (IVF) according to hourly POCT Glucose testing.*
- NO INSULIN BOLUS!!**

Dehydration/Shock

- NS 10-20 ml/kg IV over 30" - 1^o
- AVOID** excess fluid bolus' unless in shock

NO

Sodium Bicarbonate!!!!

Options	IV Fluid Options	Selection Criteria
1	Bag #1: 0.45% NS Bag #2: D ₁₀ 0.45% NS	Na ⁺⁺ > 140 mmol/dL K ⁺ > 5.5 mEq or No UO
2	Bag #1: 0.45% NS w/ 20 mEq KCL & 20 mEq KPhos Bag #2: D ₁₀ 0.45% NS w/ 20 mEq KCL & 20 mEq KPhos	Na ⁺⁺ > 140 mmol/dL K ⁺ < 5.5 mEq & UO
3	Bag #1: 0.9% NS Bag #2: D ₁₀ 0.9% NS	Na ⁺⁺ < 140 mmol/dL K ⁺ > 5.5 mEq or No UO
4	Bag #1: 0.9% NS w/ 20 mEq KCL & 20 mEq KPhos Bag #2: D ₁₀ 0.9% NS w/ 20 mEq KCL & 20 mEq KPhos	Na ⁺⁺ < 140 mmol/dL K ⁺ < 5.5 mEq & UO

2 Bags of IVF will be obtained at the same time according to the physician order.

Body Weight	Fluid needs per hour	Hourly Fluid Rate
1 st – 10 Kg	4 ml/kg/hr	4 ml x ___ Kg = ___ ml
2 nd – 10 kg	2 ml/kg/hr	2 ml x ___ Kg = ___ ml
Remaining Kg	1 ml/kg/hr	1 ml x ___ Kg = ___ ml (+)
	IVF Maintenance Rate (Normal)	___ ml/hr
*Hourly Rate	IVF Maintenance Rate (1 ½ x Normal)	Normal IVF ___ ml/hr x 1.5 = ___ ml/hr

"2 Bag Method" – for IVF Administration

- 2 Bags of IVF (see above chart for possible fluid selections) will be obtained at the same time according to the physician order.
- Total rate of fluid administration from **BOTH** bags will be calculated at 1 ½ times maintenance needs (150%)
- Percentage of fluid from **each bag** will be determined base on the patients dextrose needs.
- Rationale for "2 Bag Method:" Dextrose needs will change rapidly with intuition of therapy for DKA requiring frequent monitoring of glucose at the bedside and adjustment of dextrose administration.

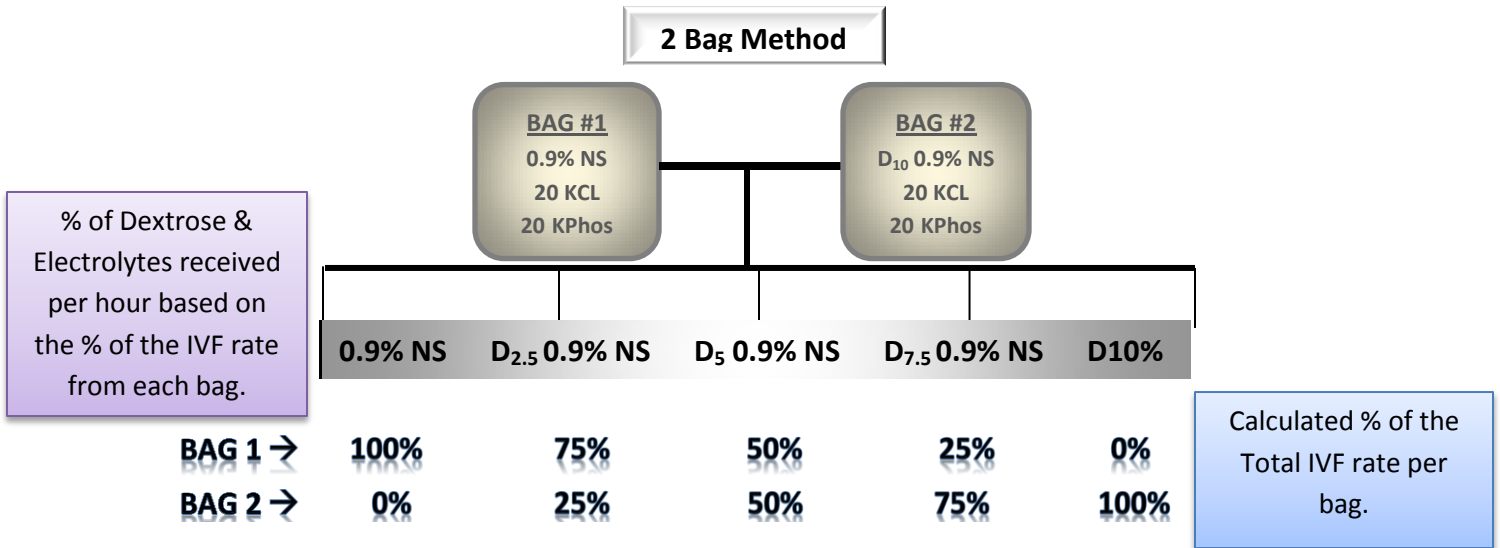


Table Determining Hourly Dextrose Requirements

Glucose	Bag #1 Percent of TIVF Rate from Saline Bag	Bag #2 Percent of TIVF Rate from Dextrose Bag
> 300	100%	OFF
275 – 300	75%	25%
250 – 274	50%	50%
225 – 249	25%	75%
< 225	OFF	100%

Example: 5 y/o with Dx. of DKA. Accu √ 275. Patient weight: 22.7 kg. BMP: Na²⁺ 138. K⁺ 3.8. MD orders 75% of Total IVF to come from bag #1 (0.9%NS w/ 20 KCL & 20 KPhos) and 25% of Total IVF to come from Bag #2 (D10 0.9%NS w/ 20 KCL & 20 KPHOS). What is the TIVF rate for this pt? ___ ml/hr

What % of the pt's daily IVF maintenance requirement are we administering? ____%.

How much Dextrose (____%), Na⁺ (____mmol), KCL (____mEq), KPHOS (____mEq) is the pt receiving every hour?

Total IVF Rate (1 ½ x maintenance): 94 ml/hr	Bag 1# IVF Rate = 70.5 ml/hr	Bag #2 IVF Rate: 23.5 ml/hr
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Formula: $10 \text{ kg} \times 4 \text{ ml/hr} = 40 \text{ ml/hr}$
 $10 \text{ kg} \times 2 \text{ ml/hr} = 20 \text{ ml/hr}$
 $2.7 \text{ kg} \times 1 \text{ ml/hr} = 2.7 \text{ ml/hr}$ (*add all together*)

 $(22.7 \text{ kg}) = 62.7 \text{ ml/hr}$ (Maintenance IVF Rate)
 $\times 1.5 \text{ ml/hr}$

94.05 ml/hr ($1 \frac{1}{2} \times$ Maintenance IVF Rate)

% of Dextrose administered per hours = $D_{2.5}$
% of Sodium Chloride Administered per hour = 0.9%
% of KCL administered per hours = 20 KCL
% of KPhos administered per hours = 20 KPhos
Total KCL administered per hour = 40 mEq

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