

# Adult DKA PowerPlan for Providers, Nurses, and Pharmacists

Cerner PowerChart, FirstNet EDUCATION

**Summary:** At Cadillac and Grayling hospitals, a new Adult Diabetic Ketoacidosis (DKA) PowerPlan will replace the existing PowerPlan to be used in the emergency department and within the hospital to guide the treatment of adults 18 years of age and older with diabetic ketoacidosis utilizing a **two-bag infusion method and electrolyte replacement protocol**.

**When:** January 30, 2024

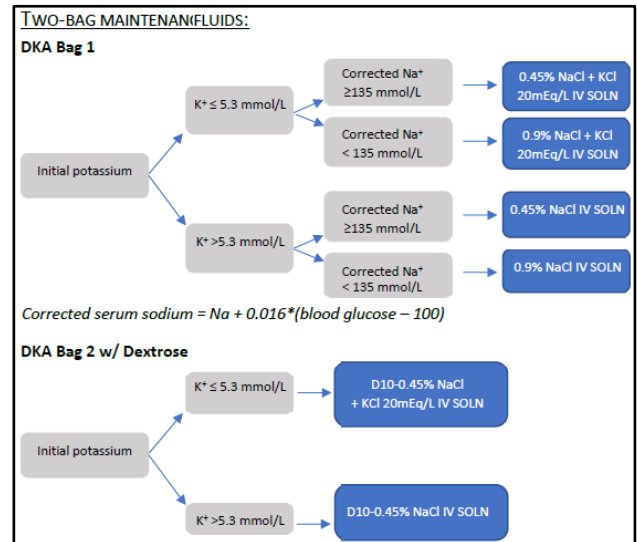
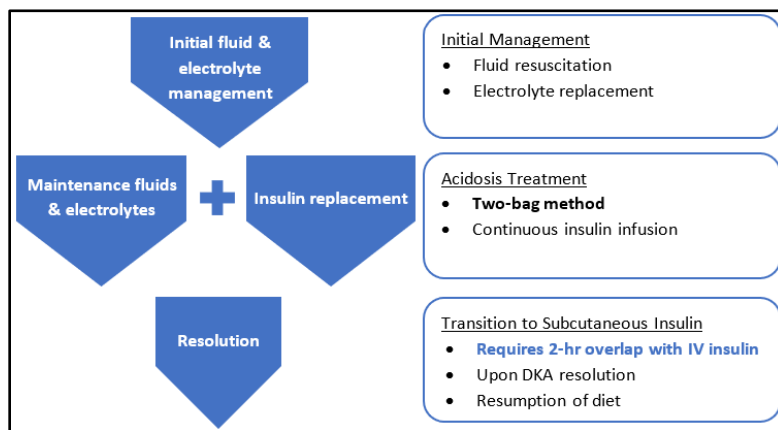
**Support:** Help Desk at 231-935-6053

## DKA Two-Bag Method Summary

The two-bag system is an approach to DKA management that uses two maintenance fluid solutions (one WITH and one WITHOUT dextrose), allowing insulin to run at a set rate.

Standard nomenclature for the naming of Bag 1 and Bag 2 on labels and smart pump infusion devices:

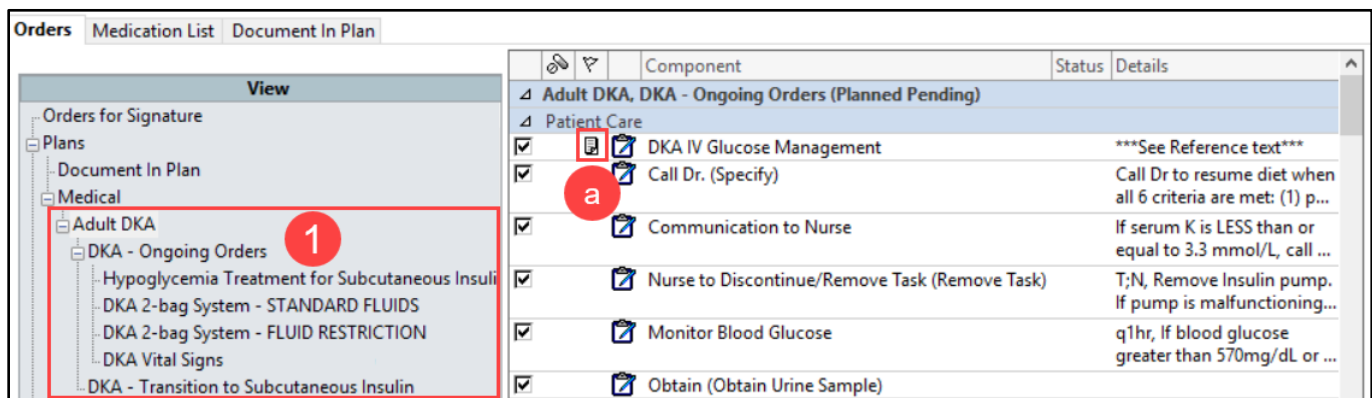
- Bag 1: DKA Bag 1
- Bag 2: DKA Bag 2 w/Dextrose



**Note:** DKA Bag 1 and DKA Bag 2 w/Dextrose are connected to two different IV pumps and connected to each other via a Y-site to be administered through one IV line.

## Adult DKA PowerPlan

1. Search for and select the Adult DKA PowerPlan.
  - a. [Reference Text](#) is also included in this PowerPlan.



**Note:** This PowerPlan should NOT be utilized for patients under the age of 18 years old.

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2. Check and uncheck orders within the PowerPlan, as needed.
3. Select the DKA 2-bag System – STANDARD FLUIDS or DKA 2-bag System – FLUID RESTRICTION.

Insulins: Continuous Infusion

- Insulin bolus not necessary with 2 bag management. Set rate of 0.1 unit/kg/hr is preferred for all patients. 0.05 unit/kg/hr rate is reserved for patients with persistent hypoglycemia despite titration of DKA Bag 2 w/Dextrose for details.
- insulin regular (Insulin Regular Drip SET RATE) 0.1 unit/kg/hr, SET RATE, IV, 100 unit, 100 mL, STAT PAUSE/HOLD insulin if K less than 3.3 mmol/L or BG less than 100 mg/dL
- Hypoglycemia Treatment for Subcutaneous Insulin Planned Pen...

Infusion(s)

- Select DKA Bag 1 and DKA Bag 2 w/Dextrose from subphase based on fluid rate, potassium, and corrected sodium. Corrected serum sodium =  $[Na + 0.016 * (BG - 100)]$
- DKA 2-bag System - STANDARD FLUIDS
- DKA 2-bag System - FLUID RESTRICTION

Medications

- Sodium bicarbonate is NOT recommended in DKA and does not improve outcomes. Administer only in severe acidemia (pH < 7.2).
- sodium bicarbonate (Sodium Bicarb IVPush) 50 mEq, IVPush, Inject, ONCE, 50 meq=1 amp
- Note (DKA Electrolyte Replacement Protocol) DKA Electrolyte Replacement, Note, q12hSTD

4. Within the DKA 2-bag System subphase, select 1 option for DKA BAG 1 and select 1 option for DKA BAG 2 w/DEXTROSE.
5. Click Return to DKA – Ongoing Orders to return to the PowerPlan.

Continuous Infusions

- \*\*\*DKA BAG 1 - select ONE option\*\*\*
- Initial potassium LESS than or equal to 5.3 mmol/L AND corrected serum sodium GREATER than or equal to 135 mmol/L
- Sodium Chloride 0.45%+KCl 20 mEq/L IV SOLN 1,000 mL, IV, TITRATE This is DKA Bag 1. Rate of Bag 1 is 0 mL/hr, 125 mL/hr, or 250 mL/hr
- Initial potassium LESS than or equal to 5.3 mmol/L AND corrected serum sodium LESS than 135 mmol/L
- Sodium Chloride 0.9% with KCl 20 mEq/L intravenous solution (Sodium Chloride 0.9%+KCl 20 mEq/L IV SOLN) 1,000 mL, IV, TITRATE This is DKA Bag 1. Rate of Bag 1 is 0 mL/hr, 125 mL/hr, or 250 mL/hr
- Initial potassium GREATER than 5.3 mmol/L AND corrected serum sodium GREATER than or equal to 135 mmol/L
- Sodium Chloride 0.45% intravenous solution (Sodium Chloride 0.45% IV SOLN) 1,000 mL, IV, TITRATE This is DKA Bag 1. Rate of Bag 1 is 0 mL/hr, 125 mL/hr, or 250 mL/hr
- Initial potassium GREATER than 5.3 mmol/L AND corrected serum sodium LESS than 135 mmol/L
- Sodium Chloride 0.9% intravenous solution (Sodium Chloride 0.9% IV SOLN) 1,000 mL, IV, TITRATE This is DKA Bag 1. Rate of Bag 1 is 0 mL/hr, 125 mL/hr, or 250 mL/hr
- \*\*\*DKA BAG 2 w/DEXTROSE - select ONE option\*\*\*
- Initial potassium LESS than 5.3 mmol/L
- Dextrose 10% - NaCl 0.45% - KCl 20 mEq 1,000 mL, IV, Start T;N, TITRATE, Routine This is DKA Bag 2 w/Dextrose. Rate of Bag 2 is 0 mL/hr, 125 mL/hr, or 250 mL/hr
- Initial potassium GREATER than 5.3 mmol/L
- Dextrose 10% with 0.45% NaCl intravenous solution 1,000 mL, IV, TITRATE This is DKA Bag 2 w/Dextrose. Rate of Bag 2 is 0 mL/hr, 125 mL/hr, or 250 mL/hr

Return to DKA - Ongoing Orders

6. Click on the Dosage Calculator icon to complete, if applicable.
7. To sign the PowerPlan, click Orders For Signature.

Orders For Signature

Continuous Infusions

INITIAL FLUID MANAGEMENT

- LR is safe in DKA and may help resolve acidosis faster than 0.9% NaCl fluid replacement.
- Lactated Ringers IV BOLUS 20 mL/kg 20 mL/kg, IV Bolus
- Sodium Chloride 0.9% intravenous solution (Sodium Chloride 0.9% IV BOLUS) 20 mL/kg, IV Bolus

INITIAL ELECTROLYTE MANAGEMENT

- If serum K is LESS than 3.3 mmol/L, K should be replaced BEFORE starting fluid replacement.
- potassium chloride (Potassium Chloride IVPB) 20 mEq, IVPB

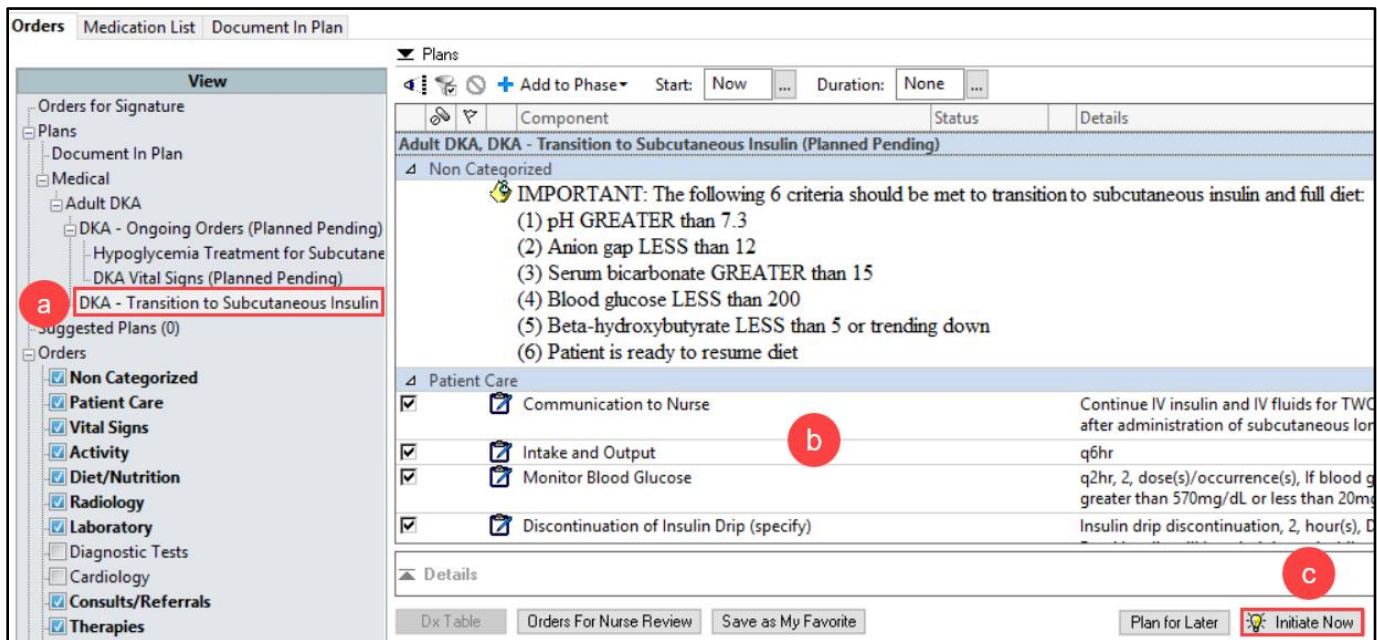
Details for Lactated Ringers IV BOLUS 20 mL/kg

Base Solution	Bag Volume	Rate	Infuse Over
Lactated Ringers IV BOLUS	20 mL/kg	Bolus	
Additive	Additive Dose	Occurrence	
Total Bag Volume	mL/kg		

8. Once the patient is ready to transition to the long-acting subcutaneous insulin, the DKA – Transition to Subcutaneous Insulin subphase of the Adult DKA PowerPlan will need to be ordered.
  - a. Select the subphase.
  - b. Check and uncheck orders within the subphase, as needed.
  - c. Click Initiate Now to sign the orders.

Long-acting subcutaneous insulin (e.g., insulin glargine) is NOT immediately active and requires time to absorb into the bloodstream. Patients recovering from DKA must continue IV insulin until the subcutaneous product is working.

IV insulin and IV fluids **MUST** continue for TWO hours after administration of subcutaneous long-acting (basal) insulin to prevent relapse back into DKA.



The screenshot displays the 'Orders' section in Cerner PowerChart. The left-hand pane shows a tree view under 'Plans' > 'Medical' > 'Adult DKA' > 'DKA - Transition to Subcutaneous Insulin', which is highlighted with a red box and a red circle labeled 'a'. The main content area shows the details of this plan, including a list of criteria for transition to subcutaneous insulin and full diet, and a table of patient care orders. The 'Patient Care' section contains several orders, with 'Intake and Output' highlighted by a red circle labeled 'b'. At the bottom right, the 'Initiate Now' button is highlighted with a red box and a red circle labeled 'c'.

Component	Status	Details
<b>Adult DKA, DKA - Transition to Subcutaneous Insulin (Planned Pending)</b>		
Non Categorized		
IMPORTANT: The following 6 criteria should be met to transition to subcutaneous insulin and full diet: (1) pH GREATER than 7.3 (2) Anion gap LESS than 12 (3) Serum bicarbonate GREATER than 15 (4) Blood glucose LESS than 200 (5) Beta-hydroxybutyrate LESS than 5 or trending down (6) Patient is ready to resume diet		
Patient Care		
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Communication to Nurse Continue IV insulin and IV fluids for TWO hours after administration of subcutaneous insulin
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Intake and Output q6hr
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Monitor Blood Glucose q2hr, 2, dose(s)/occurrence(s), If blood glucose greater than 570mg/dL or less than 20mg/dL
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Discontinuation of Insulin Drip (specify) Insulin drip discontinuation, 2, hour(s), DKA
Details		
<input type="button" value="Dx Table"/> <input type="button" value="Orders For Nurse Review"/> <input type="button" value="Save as My Favorite"/> <input type="button" value="Plan for Later"/> <input checked="" type="button" value="Initiate Now"/>		

**Note:** The Adult DKA PowerPlan can be discontinued once the patient is no longer on IV insulin and IV fluids. Nursing is tasked to discontinue the IV two hours after administration of the first dose of basal insulin.