

New IV Insulin PowerPlans Incorporating EndoTool IV Sharp Healthcare

Diabetes Service Line
4/14/2021



EndoTool IV will replace the current paper based insulin infusion orders and is incorporated into new PowerPlans (PP)

- ❖ EndoTool IV is a clinical decision support system designed to provide insulin dosing recommendations to control of hyperglycemia
- ❖ EndoTool IV is only available by initiating the appropriate PowerPlan (PP)
- ❖ EndoTool IV calculates a patient specific dosing model using:
 - Diabetes Dx (Type 2, Type 1, Gestational, or Unknown)
 - Age
 - Weight
 - Steroids (Yes/No)
 - Renal Function
 - HbA1c (%)
 - Patient's serial response to insulin
- ❖ EndoTool IV will be operated by the RN

Where are PPs with EndoTool IV available?

Search with "Starts with": "Insulin" OR Search with "Contains": "Insulin or EndoTool"

- **SMH**- SICU, MICU, ED
 - Insulin Infusion ICU Continuous
 - Diabetes Crisis PPs
- **SMBHWN**- PACU, LDR, PSCU
 - Insulin Infusion Continuous
- **SGH**: ICU, PCU, ED, Women's Health
 - Insulin Infusion Continuous – ICU and PCU versions
 - Diabetes Crisis PPs - ICU and PCU versions
- **SCVMC**: ICU, PCU, ED, Women's Health
 - Insulin Infusion Continuous – ICU, PCU, WHS versions
 - Diabetes Crisis PPs - ICU and PCU versions
- **SCOR**: ICU, ED
 - Insulin Infusion ICU Continuous
 - Diabetes Crisis PPs



Go Live:
May 4, 2021


New Hyperglycemia Continuous Insulin Infusion PowerPlan ICU EndoTool

(not for diabetes crises – e.g., DKA)

- ❖ This is the PowerPlan to use for patients with hyperglycemia without DKA/HHS
- ❖ Indications are the same as with the current continuous insulin infusion (CII) PowerPlan
- ❖ This new PowerPlan will be added to plans currently containing the CII option
- ❖ Type 2 diabetes is the default and this can be used for all patients or can be changed
- ❖ All that is required with this plan is “initiate” and “sign”
- ❖ For patients with known diabetes type 1, the default should be changed to type 1
- ❖ Limited options are provided, e.g., nutrition.

Why are there 4 New PowerPlans for Diabetes Crisis?



- Evidence shows that customized treatment of the different types of diabetes crisis optimizes outcomes and prevents complications.
- In the past, we have had only ONE PowerPlan:
 **Insulin Diabetic Crisis DKA HHS**
- A single PowerPlan could not be structured to address the various types of diabetes crises with a simple initiation process
- The four types of diabetes crises are outlined in the boxes
- An osmolality calculator is now available on the Diabetes MPage

HHS

- NO acidosis
 - HCO_3 (CO_2) ≥ 18 *mEq/L*
 - pH 7.35-7.45
 - Negative ketones
- BG generally > 600 mg/dL
- Osmolality ≥ 320 *mOsm/kg*

Hyperosmolar DKA (hDKA)

- Acidosis
 - HCO_3 (CO_2) ≤ 18 *mEq/L*
 - Anion gap > 12
 - pH < 7.3
 - Ketones
- BG generally > 600 mg/dL
- Osmolality ≥ 320 *mOsm/kg*

Standard DKA (sDKA)

- Acidosis
 - HCO_3 (CO_2) ≤ 18 *mEq/mL*
 - Anion Gap > 12
 - pH < 7.3
 - Ketones
- Blood Glucose (BG) generally > 400 mg/dL
- Osmolality < 320 *mOsm/kg*

Euglycemic DKA (eDKA)

- Acidosis
 - HCO_3 (CO_2) ≤ 18 *mEq/L*
 - Anion Gap > 12
 - pH < 7.3
 - Ketones
- BG generally ≤ 300 mg/dL
- Persistent glycosuria with SGLT2i inhibitors
- Osmolality < 320 *mOsm/kg*

Orders Common to All the Diabetes Crisis PowerPlans

Prechecked orders	*Provider <u>must</u> select	Optional orders
Nutrition - NPO	<ul style="list-style-type: none">• Type of Diabetes• Two Bag Method with or without KCL• Total IV fluid rate• IV insulin rate start up	Fluid bolus (often done in ED)
Laboratory monitoring & general monitoring guidelines		Insulin bolus (often done in ED)
Provider notification		Additional labs and diagnostic studies
Electrolyte with phosphorous replacement		

*Many orders are prechecked; see next slide for details.

EndoTool is only available by initiating a PowerPlan

Keys to Initiate The New Diabetes Crisis PowerPlans

PP Order to Review	sDKA	HHS	hDKA	eDKA
<u>Type of Diabetes</u> In the EndoTool Setting Order in the PowerPlan	ACTION NEEDED Select Type of Diabetes <i>Type 1, Type 2, Gestational, Unknown</i>			NO ACTION NEEDED If diabetes is Type 2 (preselected)
<u>IV fluid</u> Two Bag Method Provides a controlled rate of dextrose administration	ACTION NEEDED <ol style="list-style-type: none"> Select fluids either WITH or WITHOUT KCL Then select the two bags at the desired total IV rate 150 mL/hr, 200 ml/hr, or 250 ml/hr <p>The Orders for Bag A (without dextrose) and Bag B (with dextrose) are linked so that “checking” (selecting) Bag A at the desired rate, will activate the order for Bag B</p>			
<u>Insulin Drip</u> start rate	ACTION NEEDED Select Insulin drip start rate	NO ACTION NEEDED Insulin drip rate is prechecked at a fixed rate <i>EndTool IV will start when the BG < 500 mg/dl</i>		

A NEW Order in Each PowerPlan: “EndoTool Settings”

The EndoTool (ET) Settings order specifies parameters which the RN uses to start ET; in most PPs all required items in this order are preselected and no action by the provider is needed. If prompted, the type of diabetes needs to be specified.

IF initial BG is LESS than 500 mg/dL SELECT

Details for EndoTool Settings

Details Order Comments Offset Details

+ Person List Arrow

*Diabetes Diagnosis: (dropdown menu open showing Type 1, Type 2, Gestational, Unknown)

Goal Range:

Special Instructions:

Mode of Therapy: sDKA

*Start/Restart Method: from other IV

Requested Start Date/Time: **/**/**** PDT

Expands if action is needed

ACTION IS NEEDED if not already prechecked or change is desired
Provider must select: Type of Diabetes
(Type 1, Type 2, GDM or Unknown)

Implementing the Two Bag Method in the Diabetes Crisis PowerPlans

- Option available: two linked bags either WITH or WITHOUT KCL
- The provider must select the Total IV rate, options are: 150 mL/hr, 200 mL/hr, or 250 mL/hr
- For the Two Bag Method, the total IV rate includes the combined rate of Bag A (dextrose free bag) and Bag B (dextrose containing bag)
- (excludes piggybacks and concentrated dextrose such as D10W and D20W)

Selecting "The Two Bags" in the PowerPlans

Select both IV's at the desired total IV rate

Bag A + Bag B
= 150 mL/hr

or

Bag A + Bag B
= 200 mL/hr

or

Bag A + Bag B
= 250 mL/hr

Two Bag Method With K+	
<input type="checkbox"/>	NaCl 0.45%/KCl 20 mEq 1000 mL
<input type="checkbox"/>	D5-NaCl 0.45%/KCl 20 mEq 1000 mL
Total IV Rate 150 mL/hr Select BOTH orders	
IV, Rate = 150 mL/hr, Bag A	Rate of Bag A equals Total IV Rate (150 mL/hr)
Total IV Rate of Bag A plus Bag B = 150 mL/hr	Rate of Bag B equals Total IV Rate (150 mL/hr)
IV, Rate = 1 mL/hr, Bag B	
Total IV Rate 200 mL/hr Select BOTH orders	
IV, Rate = 200 mL/hr, Bag A	Rate of Bag A equals Total IV Rate (200 mL/hr)
Total IV Rate of Bag A plus Bag B = 200 mL/hr	Rate of Bag B equals Total IV Rate (200 mL/hr) min
IV, Rate = 1 mL/hr, Bag B	
Total IV Rate 250 mL/hr Select BOTH orders	
IV, Rate = 250 mL/hr, Bag A	Rate of Bag A equals Total IV Rate (250 mL/hr)
Total IV Rate of Bag A plus Bag B = 250 mL/hr	Rate of Bag B equals Total IV Rate (250 mL/hr) min
IV, Rate = 1 mL/hr, Bag B	

The order for the two bags at each combined rate are linked,  so checking Bag A automatically selects Bag B

How to Order Insulin in the DM Crisis PPs

Start up Insulin Rate Depends on Initial BG

BG \geq 500 or $<$ 500 mg/dL

- If initial BG \geq 500 mg/dL, select fixed rate (up to 0.1 unit/kg/hr; not to exceed 10 units/hr). EndoTool will be started by the RN when BG is less than 500 mg/dL.
- If initial BG $<$ 500mg/dL, select insulin with EndoTool

Exception:

For eDKA (*Euglycemic DKA*), EndoTool is prechecked since the initial BG is $<$ 300 mg/dl

Medications	
<input checked="" type="checkbox"/>	Discontinue all other insulin orders and all oral antihyperglycemic agents at the start of Enc
<input checked="" type="checkbox"/>	Insulin Bolus
<input type="checkbox"/>	insulin regular 0.1 unit/kg, IV Bo
Insulins: Continuous IV Insulin Infusion	
<input type="checkbox"/>	See Diabetes Crisis: Standard DKA Guide
<input type="checkbox"/>	IF initial BG GREATER than or equal to 500 mg/dL. SELECT fixed rate insulin drip
<input type="checkbox"/>	insulin drip IV, Use fixed rate; DO NOT start ins
<input type="checkbox"/>	Sodium Chloride 0.9% (NaCl 0.9%) IV, Rate = 10 mL/
<input type="checkbox"/>	EndoTool Settings Mode of therapy:
<input type="checkbox"/>	IF initial BG LESS than 500 mg/dL. SELECT: 'EndoTool to calculate' insulin drip
<input type="checkbox"/>	insulin drip IV, Start by select DO NOT start ins
<input type="checkbox"/>	Sodium Chloride 0.9% (NaCl 0.9%) IV, Rate = 10 mL/
<input type="checkbox"/>	EndoTool Settings Mode of therapy:
<input checked="" type="checkbox"/>	D50W for hypoglycemia
<input checked="" type="checkbox"/>	Dextrose 50% in Water (Dextrose 50% in Water dose calculation) For hypoglycemia

After EndoTool is started, insulin rate will be adjusted based on EndoTool recommendations

Questions?

For any questions, please contact your entity diabetes education team