

Insulin Drip Management



To ensure safe, consistent, and evidence-based management of insulin drips for patients requiring continuous intravenous insulin therapy for diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic states (HHS), and hyperglycemia with or without known insulin resistance. This huddle card reinforces key practices that support patient safety, timely glucose control, and adherence to clinical protocols. Consistent adherence to protocol improves outcomes and reduces complications.

General Guidelines

- Use **programmable IV pump** for all insulin drips which has both **units/hr and units/kg/hr**
- **Independent nurse double check** required for IV bolus and new bags.
- Document **start time, initial rate, and all titrations** in the EHR using the IV drip titration intervention
- Insulin drips are **restricted** to designated care areas by the *Restricted Medications Policy*.
- Use standardized concentration (e.g. Regular Insulin 100unit/100mL NS); Max Rate of 15 mL/hr
- Initial rate based on weight and clinical indication (e.g. 0.1 units/kg/hr for DKA)
- Insulin will be differentiated by “modifiers” indicative of indication in the programmable pump
- For **DKA, HHS, and Insulin Toxicology** the rate will remain **weight based** (units/kg/hr). **Biggest change is dosing in units/kg/hr**
- For all other indications **CABG, OB, Hyperglycemia** the order set **will remain in units/hr** – ALWAYS choose the modifier based on the indication
- All modifiers except Insulin Toxicology (for CCB/BB Overdose) will be available in the INSULIN drug entry



WHAT HAS CHANGED?

- ✓ Dosing is units/kg/hr
- ✓ Use the patients actual body weight
- ✓ Titration instructions
- ✓ When to notify the provider



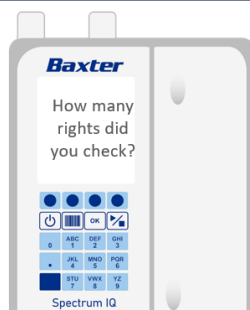
Weight-Based Dosing

CARE EXCELLENCE INDEPENDENT DOUBLE CHECKS

Did You Know?

CERTAIN MEDICATIONS REQUIRE INDEPENDENT DOUBLE CHECKS WITH 2 NURSES VERIFYING THE 6 MEDICATION RIGHTS INCLUDING:

- RIGHT PATIENT
- RIGHT MEDICATION
- RIGHT DOSE
- RIGHT TIME
- RIGHT ROUTE
- RIGHT DOCUMENTATION



WHEN THE 2ND NURSE DOCUMENTS AN INDEPENDENT DOUBLE CHECK IN THE EMR, THE 2ND NURSE IS ATTESTING TO VERIFICATION OF THE 6 MEDICATION RIGHTS. PLEASE DO NOT DOCUMENT WITHOUT VERIFYING ALL COMPONENTS.

From FL BON: Nurses are expected to exhibit honesty, accuracy, and integrity in the provision of nursing care, including: performing nursing assessments; applying the nursing process; reporting changes in patients' condition; acknowledging errors in practice and reporting them promptly; accurately charting and reporting, whether verbal or written; implementing care as ordered; complying with all laws and rules affecting the practice of nursing; and complying with the minimum standards of nursing.

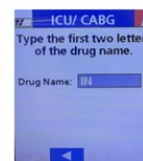
Programming IV Pump: Weight-Based

Insulin for DKA

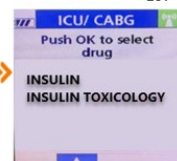
Step 1. Choose your care area



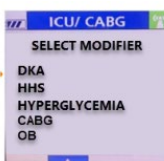
Step 2. Type the first 2 letters of the medication



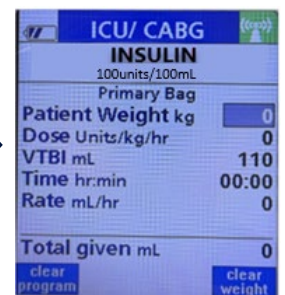
Step 3. Select your drug – INSULIN (if not for toxicology)



Step 4. Select your modifier



For DKA
Scaled Weight in kg
Dose: Units/kg/hr



Step 4. Enter the Patient's **Scaled Weight** in kg

Step 5. Enter initial dose in **units/kg/hr**

Step 6. Independent double check

Step 7. EBCD IV Drip Documentation

Version 11072025

Appendix A – DKA Protocol

Order Sets

DKA FLUID MANAGEMENT
DKAHHS MANAGEMENT ADULT

DKA MANAGEMENT

Policy Highlights

- Verify baseline labs: blood glucose (BG), potassium, anion gap, and renal function.
- Ensure IV access and cardiac monitoring are in place.
- Insulin should not be administered until serum potassium > 3.5mEq/L to avoid life threatening hypokalemia

Insulin Drip:

- Start: **0.1 units/kg/hr** (max initial 10 mL/hr)
- Titrate to max **15 mL/hr**

BG Management:

- **Acute Phase:** Point of care (POC) BG >250 mg/dL → **no dextrose** containing fluid infusing
- **Maintenance Phase:** POC BG ≤250 mg/dL → **dextrose** containing fluids infusing

Glucose Monitoring:

- Maintain Blood glucose (BG) between **150-200 mg/dL** until resolution of DKA
- > 150 mg/dL → POC every 1 hour
- ≤ 150 mg/dL → POC every 30 minutes
- When BG < 150 mg/dL for >2 hours NOTIFY PROVIDER

Transition Criteria:

- Anion gap ≤12 mmol/L, CO₂ ≥18 mmol/L, patient stable for 8 hours and tolerating PO

Actions:

- Notify provider when BG <150 to initiate long or intermediate acting insulin
- Discontinue order set, order maintenance fluids and labs as needed when appropriate
- Advance diet as appropriate, order fluids/labs
- Do not discontinue IV insulin order without giving SubQ insulin FIRST

DKA MANAGEMENT: Insulin R 100 units/100mL NS -- **Maximum rate of 15 mL/hr**

Goal: Maintain blood glucose between 150-200 mg/dL until resolution of DKA		
Acute Phase: POC BG >250mg/dL – No dextrose containing fluid running		
	If POC BG decreases by less than 50mg/dL per hour	Increase rate to 0.15 units/kg/hr
	If POC BG decreases by 50-100 mg/dL per hour	Continue current rate
	If POC BG decreases by greater than 100 mg/dL per hour	Stop insulin for 30 min and decrease rate by 0.05 units/kg/hr
Maintenance phase: POC BG ≤ 250 mg/dL – Dextrose containing fluid running		
	POC BG >250 mg/dL once in maintenance phase (previously <250 mg/dL at one point)	Increase rate by 0.05 units/kg/hr – If >250 for 3 consecutive checks, notify provider
	POC BG 201-250 mg/dL	Increase rate by 0.02 units/kg/hr
	POC BG 176-200 mg/dL	Continue current rate
	BG 150-175 mg/dL	Decrease rate by 0.02 units/kg/hr
	BG < 150mg/dL <u>and</u> Anion Gap > 12 mmol/L	• Continue insulin drip at current rate • Call Provider to adjust dextrose containing IV fluid rate
	BG < 150mg/dL <u>and</u> Anion Gap ≤ 12 mmol/L	• Call Provider to request SubQ long acting or intermediate acting insulin • Recheck BG every 30 minutes for 2 hours • 2 hours after administration of long acting or intermediate acting SubQ insulin turn off insulin drip and Notify Provider
	BG below 70 mg/dL	Initiate hypoglycemia protocol
Resolution of DKA: If pH > 7.3 and anion gap ≤ 12 mmol/L and CO₂ ≥ 18 mmol/L		

Resolution of DKA:

- If pH > 7.3 and anion gap ≤ 12 mmol/L, and CO₂ ≥ 18 mmol/L

Notify Provider:

- BG <150 for >2h to request discontinuation of order set

Appendix B – HHS Protocol



Policy Highlights

- Verify baseline labs: blood glucose (BG), potassium, anion gap, and renal function.
- Ensure IV access and cardiac monitoring are in place.
- Insulin should not be administered until serum potassium > 3.5mEq/L to avoid life threatening hypokalemia



Insulin Drip:

- Start: **0.05 units/kg/hr** (max initial 10 mL/hr)
- Titrate to max **15 mL/hr**



BG Management:

- **Acute Phase:** Point of care (POC) BG >250 mg/dL → no dextrose containing fluid infusing
- **Maintenance Phase:** POC BG ≤250 mg/dL → dextrose containing fluids infusing



Glucose Monitoring:

- **Maintain Blood glucose (BG) between 200-250 mg/dL until resolution of HHS**
- > 200 mg/dL → POC BG every 1 hour
- ≤ 200 mg/dL → POC BG every 30 minutes



Transition Criteria:

- Osmolality <300 mOsm/kg, urine output ≥0.5 mL/kg/hr, BG <250, patient stable for 8 hours, tolerating PO

Actions:

- Notify provider when BG < 200 to request long or intermediate acting insulin
- Discontinue order set, order maintenance fluids and labs as needed when appropriate
- Advance diet, order fluids/labs
- Do not discontinue IV insulin order without giving SubQ first

Order Sets

DKA FLUID MANAGEMENT
DKA/HHS MANAGEMENT ADULT

HHS MANAGEMENT

HHS MANAGEMENT - Insulin R 100 units/100mL NS --- **Maximum rate of 15 mL/hr**

Goal: Maintain blood glucose between 200-250 mg/dL until resolution of HHS

Acute Phase: POC BG >250mg/dL – No dextrose containing fluid running

If POC BG decreases by less than 50mg/dL per hour	Increase rate by 0.05 units/kg/hr
If POC BG decreases by 50-100 mg/dL per hour	Continue current rate
If POC BG decreases by greater than 100 mg/dL per hour	Stop insulin for 30 min and decrease rate by 0.05 units/kg/hr
Maintenance phase: POC BG ≤ 250 mg/dL – Dextrose containing fluid running	
POC BG > 250mg/dL once in maintenance phase (previously <250 mg/dL at one point)	Increase rate by 0.02 units/kg/hr -- If >250 for 3 consecutive checks, notify provider
POC BG 226-250 mg/dL	Continue current rate
BG 200-225 mg/dL	Decrease rate by 0.02 units/kg/hr
BG < 200 mg/dL HHS NOT resolved	• Continue insulin drip at current rate • Call Provider to adjust dextrose containing IV fluid rate
BG < 200 mg/dL and HHS resolved Resolution of HHS: osmolality < 300 mOsm/kg and hypovolemia has been corrected (urine output ≥ 0.5 mL/kg/hour) and glucose < 250 mg/dL	• Call Provider to request SubQ long acting or intermediate acting insulin • Recheck BG every 30 minutes for 2 hours • 2 hours after administration of long acting or intermediate acting SubQ insulin turn off insulin drip and Notify Provider
BG below 70 mg/dL	• Initiate hypoglycemia protocol

Resolution of HHS: If osmolality < 300 mOsm/kg **and** hypovolemia has been corrected (urine output ≥ 0.5 mL/kg/hour) **and** glucose < 250 mg/dL

Resolution of HHS:

- If osmolality <300 mOsm/kg **and** urine output ≥0.5 mL/kg/hr **and** BG <250 mg/dL

Notify Provider:

- When BG < 200 for >2h to request discontinuation of order set



Appendix C – Insulin Hyperglycemia Protocol (previously called nonDKA)

Policy Highlights:

- Upon receipt of Insulin Drip protocol, review electronic health record ensuring **ALL** previous insulin and BG monitoring are discontinued
- IV insulin requires **independent nurse double check**
- Protocol **EXCLUDES**: DKA, HHS, CABG, OB, and toxicology patients

Target BG: 110–150 mg/dL

Monitoring:

- On admission/arrival to room
- Every HOUR (1 hr) until stabilized
- After 4 consecutive BG values within target range decrease BG checks to every 2 hours
- Resume q1h for the following clinical changes:
 - Any change in insulin infusion rate
 - Significant changes in clinical condition
 - Starting or stopping vasopressor or steroid therapy
 - Starting or stopping dialysis
 - Starting, stopping or changing rates of TPN, PPN, or tube feedings
 - If on TPN/PPN, and there is insulin in the ordered formula, please notify provider and/or pharmacist that an insulin drip has been ordered

Order Sets

Insulin (infusion) non-DKA
INSULIN DRIP ICU**

**not yet live but will take the place of non-DKA set

HYPERGLYCEMIA MANAGEMENT - Insulin R 100 units/100mL NS					
Algorithm 1 (Mild)		Algorithm 2 (Moderate)		Algorithm 3 (Aggressive)	
Start with Algorithm 1 • If the blood glucose is greater than or equal to 150 mg/dL after 2 hours of following Algorithm 1 AND blood glucose has decreased by less than 50 mg/dL over the second hour, move to Algorithm 2		• If the blood glucose is greater than or equal to 150 mg/dL after 2 hours of following Algorithm 2 AND blood glucose has decreased by less than 50 mg/dL over the second hour, move to Algorithm 3 . • If the glucose remains 110-150 mg/dL for 4 consecutive hours, move to Algorithm 1		• If the blood glucose is greater than or equal to 150 mg/dL after 6 hours of following Algorithm 3 , contact primary service for other insulin orders. • If the glucose remains 110-150 mg/dL for 4 consecutive hours, move to Algorithm 2	
Glucose POC (mg/dL)	Insulin Infusion Rate (units/hr)	Glucose POC (mg/dL)	Insulin Infusion Rate (units/hr)	Glucose POC (mg/dL)	Insulin Infusion Rate (units/hr)
Greater than 400	16	Greater than 400	23	Greater than 400	30
351 – 400	14	351 – 400	20	351 – 400	27
301 – 350	12	301 – 350	18	301 – 350	24
251 – 300	10	251 – 300	15	251 – 300	20
201 – 250	8	201 – 250	12	201 – 250	16
171 – 200	5	171 – 200	7	171 – 200	10
151 – 170	3	151 – 170	4	151 – 170	6
131 – 150	2	131 – 150	3	131 – 150	4
110 – 130	1	121 – 130	2	121 – 130	3
Less than 110	0	110 – 120	1	110 – 120	2
		Less than 110 (move to Algorithm 1)	0	Less than 110 (move to Algorithm 2)	0

Algorithm Progression: (see chart)

- Start with **Algorithm 1**
- Escalate to **Algorithm 2** if BG $\geq$ 150 mg/dL after 2 hours of following **Algorithm 1** and BG has decreased by $<$ 50 mg/dL the 2nd hour
- Escalate to **Algorithm 3** if BG $\geq$ 150 mg/dL after 2 hours of following **Algorithm 2** and BG has decreased by $<$ 50 mg/dL the 2nd hour
- While in **Algorithm 3**: if BG remains $\geq$ 150 mg/dL after 6 hours, **contact primary provider** for additional Insulin orders
- If BG remains 110-150 mg/dL for 4 consecutive hours then **de-escalate** to the next lower algorithm. For example, if the patient is on Algorithm 3 then de-Escalate to Algorithm 2.

Appendix D – Beta Blocker/Calcium Channel Blocker Toxicity High-Dose Insulin Protocol

Order Sets

ED SUSPECTED
TOXICITY TX

Policy Highlights:

- Provider-driven protocol ONLY
- RN titration not permitted
- High-risk concentration requires caution
- Always call poison control hotline at 1-800-222-1222 for any suspected toxicity cases and follow their guidance

Monitoring:

Glucose

- POC BG every 15 minutes
- After 4h stable → every 1 hour

Potassium

- Baseline serum potassium
- Then every 30 minutes

Insulin Concentration:

- 24hr pharmacy facilities: ALWAYS use Insulin R 800 units/50 mL NS
- Non-24hr pharmacy facilities: May use Myxredlin Premix insulin 100 units/100 mL NS (transition to Insulin R 800 units/50mL when pharmacy opens)

BG Management:

- If BG < 200 mg/dL, give 25g Dextrose 50mL IV once
- Maintain target BG between 100–200, Begin D10W @ 125 mL/hr titrating per provider order

- These suggested doses do not supersede clinical judgement or poison control guidance

Insulin Management:

- Bolus: Regular insulin 1 unit/kg IV **ONCE**

INSULIN - HIGH DOSE INFUSION GUIDANCE- Insulin R 800 units/50 mL NS (Non 24h facilities may start with Myxredlin Premix 100 units/100 mL)

Blood glucose assessment and maintenance		
If blood glucose is < 200 mg/dL	Give 25 g (50mL) of dextrose IV once	
Maintain target BG between 100-200 mg/dL	Start D10W infusion at 125mL/hr	Titrate per Provider order
NOTIFY PROVIDER when glucose remains below 200mg/dL for 4 hours		
Insulin management		
Bolus	Regular insulin 1 unit/kg IV once	
Initial dose:	Start infusion at 1 unit/kg/hr	Titrate per Provider order
Resolution of toxicity: Reversal of cardiac abnormalities, increased BP (SBP > 90mmHG), > 50% improvement in myocardial ejection fraction, Heart Rate > 60 beats/min, Urine output > 0.5 mL/kg/hr, Resolution of acidemia and euglycemia		

- Infusion: Start initial dose at **0.5 units/kg/hr** → titrate per provider order

Notify Provider:

- BG remains < 200 mg/dL for 4 hours

Resolution Criteria:

- Reversal of cardiac abnormalities such as ↑ BP (SBP > 90 mmHG), HR > 60 bpm, ↑ EF, urine output > 0.5 mL/kg/hr,
- Resolution of acidemia (pH 7.35-7.45) and euglycemia (BG between 100-200 mg/d)

Appendix E – Subcutaneous Insulin Protocol

Policy Highlights:

- SubQ insulin preferred for basal-bolus
- Transition off IV insulin must be provider-directed
- Do not hold basal insulin (i.e. insulin glargine or insulin NPH) without a provider order

Target BG: 100–180 mg/dL

Transition from IV to SubQ insulin:

- Continue IV insulin 24h post cardiovascular surgery
- Administer SubQ insulin per order → wait 2 hours → stop IV insulin drip and DKA IV fluids as ordered.
- Continue appropriate maintenance IV as ordered

Order Sets

BASAL BOLUS INSULIN
ADULT

Basal Insulin (insulin glargine or insulin NPH) Dosing Calculations:

- Total daily dose (TDD) while on insulin drip _____ x 0.5 = Basal dose _____ units
- Insulin Glargine: _____ units SubQ at Bedtime
- Insulin NPH: _____ units BID before meals; use same TDD divided by two doses

Scale Types:

- Low, Moderate, High, Very High Intensity
- Dosing based on BG ranges (see chart)
- Recommend starting no lower than moderate intensity for known diabetics

Notify Provider:



- Call provider to **INCREASE** sliding scale by **ONE** level when 2 BG levels are >180 within a 12h period only if all BG readings are >100
- Call provider to **DECREASE** sliding scale by **ONE** level when 2 BG levels are <100 within a 12h period or any < 70

Low Intensity sliding scale

Blood sugar 150-199 mg/dL = 1 unit
Blood sugar 200-249 mg/dL = 2 units
Blood sugar 250-299 mg/dL = 3 units
Blood sugar 300-349 mg/dL = 4 units
Blood sugar 350-399 mg/dL = 5 units
Blood sugar >= 400 mg/dL = 6 units and call MD

Moderate Intensity sliding scale

Blood sugar 140-169 mg/dL = 1 unit
Blood sugar 170-199 mg/dL = 2 units
Blood sugar 200-229 mg/dL = 3 units
Blood sugar 230-259 mg/dL = 4 units
Blood sugar 260-289 mg/dL = 5 units
Blood sugar 290-319 mg/dL = 6 units
Blood sugar 320-349 mg/dL = 7 units
Blood sugar 350-379 mg/dL = 8 units
Blood sugar 380-409 mg/dL = 9 units
Blood sugar >= 410 mg/dL = 10 units and call MD

High Intensity sliding scale

Blood sugar 140-179 mg/dL = 2 units
Blood sugar 180-219 mg/dL = 4 units
Blood sugar 220-259 mg/dL = 6 units
Blood sugar 260-299 mg/dL = 8 units
Blood sugar 300-339 mg/dL = 10 units
Blood sugar 340-379 mg/dL = 12 units
Blood sugar 380-419 mg/dL = 14 units
Blood sugar >= 420 mg/dL = 16 units and call MD

Very High Intensity sliding scale

Blood sugar 140-169 mg/dL = 2 units
Blood sugar 170-199 mg/dL = 4 units
Blood sugar 200-229 mg/dL = 6 units
Blood sugar 230-259 mg/dL = 8 units
Blood sugar 260-289 mg/dL = 10 units
Blood sugar 290-319 mg/dL = 12 units
Blood sugar 320-349 mg/dL = 14 units
Blood sugar 350-379 mg/dL = 16 units
Blood sugar 380-409 mg/dL = 18 units
Blood sugar >= 410 mg/dL = 20 units and call MD

Appendix F – Hypoglycemia Protocol

Protocol Highlights:

Hypoglycemia = BG < 70 mg/dL

Protocol ensures safe and rapid correction of BG levels

Signs & Symptoms:

- Sweating
- Facial pallor
- Shakiness/Tremors
- Increased appetite
- Nausea
- Dizziness or light-headedness
- Sleepiness
- Weaknesses
- Rapid heart rate
- Headache
- Tingling around mouth and tongue
- Change in Level of Consciousness (ranging from confusion to coma)
- Seizures

Order Sets

HYPOGLYCEMIA
TREATMENT

BG Management:

- Choice of tab vs gel is dependent on facility formulary, gel is only available for pediatrics

Management with Oral Access:

- BG 54-69 → 16g glucose tab, 4oz juice/soda (DO NOT use DIET DRINKS)
- BG < 54 → 32g glucose tab, 8oz juice/soda (DO NOT use DIET DRINKS)

Without Oral Access:

- BG 54-69 → D50W 12.5g IVP or D10W 12.5g IVPB q15min PRN
- BG < 54 → D50W 25g IVP or D10W 25g IVPB q15min PRN

No IV Access:

- BG < 69 → Glucagon 1mg IM q15min PRN

HYPOGLYCEMIA MANAGEMENT

For patient WITH intact oral/enteral access

blood glucose 54-69 mg/dL	Glucose chewable tablet 16 gram orally every 15 minutes as needed Juice/soda 4 ounces orally or via tube every 15 minutes as needed Glucose gel 15 gram orally every 15 minutes as needed
blood glucose less than 54 mg/dl	Glucose chewable tablet 32 gram orally every 15 minutes as needed Juice/soda 8 ounces orally or via tube every 15 minutes as needed Glucose gel 30 gram orally every 15 minutes as needed

For patient WITHOUT intact oral/enteral access

blood glucose 54-69 mg/dl	Dextrose 50% (D50W) IV 12.5-gram intravenous push every 15 minutes as needed During shortage: Dextrose 10% (D10W) IVPB 12.5-gram intravenous piggyback every 15 minutes as needed
blood glucose less than 54mg/dl	Dextrose 50% (D50W) IV 25-gram intravenous push every 15 minutes as needed During shortage: Dextrose 10% (D10W) IVPB 25-gram intravenous piggyback every 15 minutes as needed

For patient WITHOUT IV access

blood glucose less than 69 mg/dl	Glucagon 1 milligram intramuscularly every 15 minutes as needed
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Note: Glucose Gel stocked only at Kendall, Palms West, Mercy and University