

University of Toledo Insulin Infusion (STANDARD DOSE) – Adult – Practice Protocol

Glucose Monitoring Orders: Perform blood glucose monitoring every hour until within **target range (110-150 mg/dL)** for 3 hours (3 readings in a row), then decrease frequency to every 2 hours. **Hourly monitoring must be resumed if blood glucose deviates from target range.** Serum monitoring should be performed for patients with Hct<20%, severely compromised circulation, and other conditions in which peripheral blood glucose monitoring is known to be unreliable.

Insulin Infusion Orders: Initiating Infusion: (NOTE: After priming IV tubing, waste additional 20 ml of insulin infusion to saturate all plastic tubing binding sites-electrostatic interaction).

Column 1: INSULIN SENSITIVE. Only start here for extremely insulin sensitive patients (i.e., patients with type 1 diabetes using less than 30 units of insulin at home or s/p islet transplant).

Column 2: MOST. Start here for most patients (NOTE exceptions from Column 1 or 3).

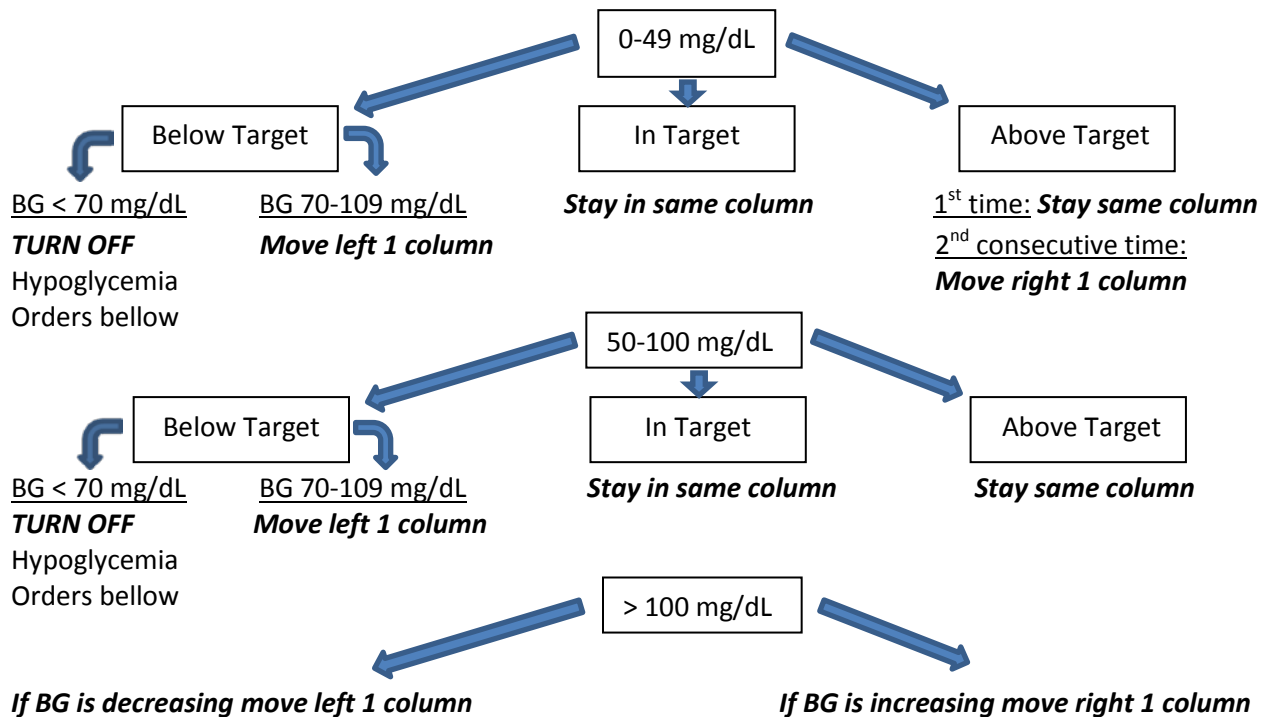
Column 3: INSULIN RESISTANT. Only start here if: Glucose \geq 600 mg/dL; s/p solid organ transplant; receiving vasopressors or steroids.

Columns 4-6: DO NOT USE FOR START.

Columns 7-9: ONLY FOR USE IN ICU (HIGH DOSE).

Rules for Column changes (1-6):

A. Determine the amount of glucose change since previous glucose check and follow decision trees:



B. Do not move more than 1 column each hour unless specifically ordered.

C. Consider moving right after initiation or increase of vasopressors or steroids, tube feeding or TPN if BG increases with subsequent monitoring.

D. Consider moving left after reduction or discontinuation of above medications or 4 hours after 1st subcutaneous dose of long-acting insulin if BG decreases with subsequent monitoring.

E. Nutritional Considerations: If subcutaneous rapid-acting insulin is administered with meals, stay in the same column for the next 2 hours. Two hours after, resume use of decision trees above.

iej [®]	Column 1		Column 2		Column 3		Column 4		Column 5		Column 6		Column 7-9
	BG	U/hr	BG	U/hr	BG	U/hr	BG	U/hr	BG	U/hr	BG	U/hr	
	≥ 360	3	≥ 360	6	≥ 360	12	≥ 360	18	≥ 360	26	≥ 360	30	ICU provider order required for use of HIGH DOSE Insulin Infusion.
	330-359	2.5	330-359	4	330-359	9	330-359	15	330-359	24	330-359	30	
	300-329	2	300-329	4	300-329	8	300-329	13	300-329	22	300-329	28	
	270-299	1.8	270-299	3	270-299	7	270-299	11	270-299	18	270-299	28	
	240-269	1.5	240-269	3	240-269	6	240-269	10	240-269	14	240-269	24	
	210-239	1	210-239	2	210-239	5	210-239	8	210-239	12	210-239	20	
	180-209	1	180-209	2	180-209	4	180-209	6	180-209	10	180-209	16	
	151-179	0.8	151-179	1.5	151-179	3	151-179	5	151-179	9	151-179	12	
Target Range	140-150	0.5	140-150	1.2	140-150	2.5	140-150	4	140-150	8	140-150	10	
	130-139	0.3	130-139	1	130-139	2	130-139	3	130-139	5	130-139	8	
	110-120	0.2	110-120	0.8	110-120	1.5	110-120	2.5	110-120	4	110-120	6	
	89-109	OFF	BG < 110 mg/dL : Move left 1 column every hour until BG is back within Target Range										Move to Column 7 when criteria met to move right 1 column for patients currently in Column 6.
	Check BG hourly, resume infusion when BG > 109 mg/dL		100-109	0.5	100-109	1	100-109	1.5	100-109	2	100-109	4	
			90-99	0.2	90-99	0.5	90-99	1	90-99	1.5	90-99	3	
			70-89	0.2	70-89	0.2	70-89	1	70-89	1	70-89	1.5	
	< 70	OFF	< 70	OFF	< 70	OFF	< 70	OFF	< 70	OFF	< 70	OFF	Notify ICU provider when move to Column 7 is warranted.
BG < 70 mg/dL = hypoglycemia (see hypoglycemia Treatment Orders)													

Hypoglycemia Treatment Orders:

1. Stop infusion. (Infusion should be off for at least 30 minutes. See step 4 below for how to re-start).

2. Provide Treatment:

If unable to eat or swallow safely or NPO: Administer Dextrose 50% per orders

If able to eat or swallow safely and BG is 40-69 mg/dL: Give 15 grams of carbohydrates (i.e. 4 ounces of juice or 4 glucose tablets); **if BG is less than 40 mg/dL:** Give 30 grams of carbohydrates (i.e. 8 ounces of juice or 8 glucose tablets)

3. Recheck BG 5 minutes after. Repeat treatment as ordered until BG ≥ 80 mg/dL. Another BG need to be checked before re-starting infusion.

4. **Re-start infusion if insulin has been off for 30 minutes AND if current BG is 110 mg/dL or greater. Move Left 1 column and re-start infusion rate according to current BG (if already using Column 1, follow dosing parameters as written in column 1).**

University of Toledo Insulin Infusion (HIGH DOSE) – Adult – Practice Protocol (ICU ONLY)

Rules for Column changes (7-9):

- A. A patient must be in the ICU to use the HIGH DOSE insulin infusion Columns 7-9.**
- B. Notify provider when patient initially meets criteria to move to Columns 7-9.**
- C. A patient must be using Column 6 and meet criteria to move right 1 column in order to transition to Column 7.**
- D. When criteria are met to move left 1 column for a patient using column 7, patient should be moved back to Column 6 of the STANDARD DOSE Insulin Infusion Protocol.**
- E. Apply same rules for column changes as Rules for Column Changes (1-6)**

jcj®	Column 7		Column 8		Column 9	
	BG	U/hr	BG	U/hr	BG	U/hr
	≥ 360	38	≥ 360	46	≥ 360	54
	330-359	36	330-359	42	330-359	48
	300-329	34	300-329	38	300-329	44
	270-299	30	270-299	34	270-299	38
	240-269	26	240-269	30	240-269	34
	210-239	22	210-239	26	210-239	30
	180-209	18	180-209	22	180-209	26
	151-179	15	151-179	18	151-179	22
Target Range	140-150	12	140-150	15	140-150	18
	130-139	10	130-139	12	130-139	15
	110-120	8	110-120	10	110-120	12
BG < 110 mg/dL : Move left 1 column every hour until BG is back within Target Range; revert to columns 1-6 as needed						
	100-109	5	100-109	6	100-109	8
	90-99	4	90-99	5	90-99	7
	70-89	3	70-89	3	70-89	5
	< 70	OFF	< 70	OFF	< 70	OFF
BG < 70 mg/dL = hypoglycemia (see hypoglycemia Treatment Orders)						