

UWMC OPERATING ROOM AND PRE-OP HOLDING INSULIN INFUSION PROTOCOL

Goal BG Range = 100-140 mg/dL

Triggers to consider for initiating insulin infusion protocol

- Patient is diabetic
- Glucose level > 140 mg/dL
- For all inpatients, perform an intraoperative glucose measurement within 45 min past Start of Procedure and if glucose level > 140 mg/dL then initiate insulin infusion protocol

Insulin infusion protocol

- Discontinue All Previous Subcutaneous Insulin Orders
- Standard insulin infusion: 100 units/100 mL 0.9% Sodium chloride via an infusion device
- Confirm piggyback of 5% Dextrose and administer Dextrose per section "Dextrose infusion"
- Check blood glucose (BG) hourly

Treatment of Hypoglycemia (BG ≤ 70 mg/dL) or symptoms of hypoglycemia

- Turn off insulin infusion for any BG below goal **AND**
- Give 25 mL (1/2 amp) of 50% dextrose IV if BG 50-70 mg/dL **OR**
- Give 50 mL (1 amp) of 50% dextrose IV if BG < 50 mg/dL.
- Recheck BG every 20 minutes until BG ≥ 100 mg/dL
 - IF BG is < 70 mg/dL repeat 25 mL (1/2 amp) 50% dextrose
 - WHEN BG is > 100 mg/dL, restart the insulin infusion at a lower dose by using one algorithm **LEFT** from previous algorithm (see "Evaluating Trends & Using Algorithms" section).

Standard Insulin Infusion Table

Go to Algorithm 0.5 only if Algorithm 1 results in below goal BG	Algorithm 1 Start here for Type 1 DM & Non-DM > 140 mg/dL		Algorithm 2 Start here for Type 2 DM		Algorithm 3 Never start here		Algorithm 4 Never start here		If NOT achieving glycemic control in Algorithm 4 for 3 consecutive hours, consider HIGH DOSE Infusion
	BG	Units/hr	BG	Units/hr	BG	Units/hr	BG	Units/hr	
	≤ 70: HYPOglycemia (See page 1 for treatment) Important: Restart insulin infusion when BG > 100								
71-99: Turn off insulin infusion & recheck BG in 20 minutes. Important: Restart insulin infusion when BG > 100									
	100-120	0.5	100-120	1	100-120	1.5	100-120	2	
	121-140	0.8	121-140	1.5	121-140	2.5	121-140	3.5	
	141-160	1.2	141-160	2	141-160	3	141-160	4.5	
	161-180	1.5	161-180	2.5	161-180	4	161-180	6	
	181-210	2	181-210	3	181-210	5	181-210	7.5	
	211-240	2.5	211-240	4	211-240	6.5	211-240	9.5	
	241-270	3	241-270	5	241-270	8	241-270	11	
	271-300	3.5	271-300	6	271-300	9	271-300	13	
	301-330	4	301-330	6.5	301-330	10.5	301-330	15	
	331-360	4.5	331-360	7.5	331-360	12	331-360	17	
	> 360	5	> 360	8.5	> 360	14	> 360	19	

Evaluating Trends & Using Algorithms:

Move right or left only one algorithm per BG check. Subtract current BG reading from previous BG reading for the change in BG. Do NOT change algorithms for new BG made < 30 minutes after the previous one.

- BG in goal range:
 - If BG has decreased >50 mg/dL/hour, move **LEFT** one algorithm and use appropriate rate from table. Recheck BG in 20-30 minutes if BG decreased >100 mg/dL
 - If BG has decreased ≤50 mg/dL/hour, maintain patient within current algorithm and adjust rate until patient is in goal range for 4 hours
 - Once patient is within goal range for 4 hours, do NOT adjust rate unless BG change is >50 or BG exits goal range
- BG **above** goal range:
 - If BG has not decreased by at least 50 mg/dL/hour, move **RIGHT** one algorithm and use appropriate rate from table
 - If BG has decreased by 50-75 mg/dL/hour, stay within current algorithm and use appropriate rate from table
 - If BG has decreased > 75 mg/dL/hour, move **LEFT** one algorithm and use appropriate rate from table. Recheck BG in 20-30 minutes if BG decreased >100 mg/dL/hour
- Hypoglycemic event or BG below goal range
 - Turn off insulin infusion. Treat hypoglycemia if BG < 70 mg/dL. Recheck BG in 20 minutes.
 - When BG is > 100 mg/dL move **LEFT** one algorithm and use appropriate rate from table when BG returns to goal range.

Dextrose infusion:

Co-administer 5% Dextrose at 100 mL/hr with insulin infusion when

- BG < 200 mg/dL in patients who take insulin as outpatients,
- BG < 150 mg/dL in patients who do not take insulin as outpatients.
- Patients known to be Type I diabetics, have a history of ketoacidosis, or have taken gliflozin drugs within three days should receive glucose infusions regardless of blood glucose level.

Co-administration of 5% Dextrose with insulin infusion is not necessary for procedures utilizing cardiopulmonary bypass.

LOW DOSE Insulin Infusion Orders

Use only if Alg.1 in Standard Insulin Infusion Table results in below goal BG

Algorithm 0.5	
Use only if Alg.1 results in below goal BG	
BG	Units/hr
≤ 70: HYPOglycemia Orders. Important: Restart insulin infusion when BG > 100	
71-99: Turn off insulin infusion & recheck BG in 20-30 minutes. Important: Restart insulin infusion when BG > 100	
100-120	0.3
121-140	0.5
141-160	0.7
161-180	0.9
181-210	1.1
211-240	1.4
241-270	1.7
271-300	2
301-330	2.3
331-360	2.6
> 360	3

HIGH DOSE Insulin Infusion Orders

For patients NOT achieving glycemic control with Standard Dose Insulin Infusion Orders for X 3 or more consecutive hours.

HIGH DOSE Insulin Infusion Algorithm Table

	Algorithm 5		Algorithm 6		Algorithm 7		Algorithm 8	
	BG	Units/hr	BG	Units/hr	BG	Units/hr	BG	Units/hr
Algorithm 4 See Standard Insulin Infusion	<70 = Hypoglycemia (See Hypoglycemia Protocol)							
	71-99: Off x 20-30 minutes & recheck BG							
	100-110: Consider moving left one Algorithm if trending down. Recheck BG in 20-30 min.							
	100-120	3	100-120	4	100-120	5	100-120	6
	121-140	5	121-140	6.5	121-140	8.5	121-140	10
	141-160	7	141-160	9	141-160	12	141-160	14
	161-180	9	161-180	12	161-180	15	161-180	18
	181-210	11	181-210	15	181-210	19	181-210	23
	211-240	14	211-240	19	211-240	23	211-240	28
	241-270	17	241-270	23	241-270	28	241-270	34
	271-300	20	271-300	26	271-300	33	271-300	40
	301-330	23	301-330	30	301-330	38	301-330	46
331-360	26	331-360	34	331-360	42	331-360	52	
>360	29	>360	38	>360	47	>360	57	