



Prince Sultan Military Medical City

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Departmental Policy	Dept.: Intensive Care Services	Policy No: 1-2-9451-01-014 Version No: 03
Title: Insulin Infusion Protocol For Adult Critically Ill Patient		JCI Code: COP
Supersedes: 1-2-9451-01-014 Version No.02; 01 February 2021	Issue Date:	Effective Date: 17 APR 2024
		Revision Date: 16 APR 2027
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1. INTRODUCTION

- 1.1. This algorithm is not intended to be used for those individuals with Type 1 diabetes, diabetic ketoacidosis or hyperglycemic hyperosmolar states.
- 1.2. Target Range for Glycemic Control: 8-10 mmol/L (140- 180 mg/dL)
 - 1.2.1. Standard drip 50 units/50 mL 0.9% NaCl. (use Regular Insulin)
 - 1.2.2. Start IV insulin therapy when glucose is above target range.

2. PROCEDURES

- 2.1. Target Range for Glycemic Control: 8-10 mmol/L (140- 180 mg/dL)
 - 2.1.1. Standard drip 50 units/50 mL 0.9% NaCl. (use Regular Insulin)
 - 2.1.2. Start IV insulin therapy when glucose is above target range.
- 2.2. Stop Insulin infusion when:
 - 2.2.1. Hypoglycemia (**Blood Sugar** = < 3.5 mmol/L) developed.
 - 2.2.2. Patient has no history of diabetes and is receiving <1 Unit/hour.
 - 2.2.3. Feeding is stopped and patient is not on glucose containing infusion.
 - 2.2.4. During transportation from or to the ICU.
 - 2.2.5. When patient is shifted to subcutaneous insulin.
 - 2.2.6. When patient start to eat orally or on bolus NGT feeding.
- 2.3. Patient Monitoring
 - 2.3.1. Hourly venous (main lab) determinations until glucose <25 mmol/L; then capillary glucose (finger sticks) q 1hour until glucose is within goal x 4 hours; then every 2 hours x 4 hours; If stable, decrease monitoring to every 2 hours.
 - 2.3.2. Hourly monitoring indicated for critically ill patients even if the glucose is stable.
 - 2.3.3. In hypotensive patients (BP <80/60), capillary glucose values may be inaccurate. Obtain venous blood for glucose determinations.
 - 2.3.4. If any of the following occur, temporary resume hourly glucose monitoring, until glucose is again stable (2–3 consecutive values within target range):
 - 2.3.4.1. Any change in insulin infusion rate.



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- 2.3.4.2. Significant changes in clinical condition.
- 2.3.4.3. Starting or stopping pressor or steroid therapy.
- 2.3.4.4. Starting or stopping dialysis.
- 2.3.4.5. Starting, stopping or changing rates of TPN, PPN or tube feedings.
- 2.4. Treatment of Hypoglycemia (Glucose <3.5mmol/L)
 - 2.4.1. Discontinue insulin drip AND Give D50W IV
 - 2.4.1.1. Glucose 2.5-3.5mmol/L 12.5 g (1/2 amp of D50%)
 - 2.4.1.2. Glucose <2.5mmol/L 25.0 g (1 amp of D50%)
 - 2.4.2. Recheck glucose every 15–30 minutes and repeat D50W IV as above.
 - 2.4.3. Restart insulin drip, one algorithm lower, when glucose >8 mmol/L x 2 times
- 2.5. Notify the physician:
 - 2.5.1. For patients not responding to Algorithm 1 or 2.
 - 2.5.2. For hypoglycemia which has not resolved after administration of D50W IV and discontinuation of the insulin drip.
- 2.6. ICU Glycemic control titration guidelines:
 - 2.6.1. Initiating the insulin infusion

Glucose	10.1-12	12.1-15	15.1-18	18.1-21	> 21
Insulin bolus	2	4	6	8	Call MD
Initial rate	1	2	4	6	Call MD

- 2.6.2. Adjusting insulin infusion:
 - 2.6.2.1. Start all patients who require insulin infusion on ALGORITHM 1.
 - 2.6.2.2. If blood sugar is not controlled (not in target range) for 2 hours shift to ALGORITHM 2.
 - 2.6.2.3. Similarly if it is not controlled for 2 hours shift to ALGORITHM 3.



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GLUCOSE	ALGORITHM 1	ALGORITHM 2	ALGORITHM 3
< 3.5	0	0	0
3.5-8	0	0	0
8.1-10	0	0.5	1
10.1-12	1	2	3
12.1-14	2	3	4
14.1-16	3	4	5
16.1-18	4	5	6
18.1-20	5	6	7
>20	6 & Call MD	7 & Call MD	8 & Call MD

3. REFERENCES

- 3.1. Brunkhorst FM et. Al Intensive Insulin Therapy and Pentasstarch Resuscitation in Severe Sepsis N Engl J med 2008; 358: 125-39.
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- 3.6. Krinsley JS et al. Effect of an Intensive Glucose Management Protocol on the Mortality of Critically Ill Adult Patients Mayo ClinProc 2004; 79 (8): 992-1000
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4. CONTRIBUTING DEPARTMENT

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