

Blood Glucose Target Ranges for IV Insulin Infusions Impact Inpatient Glucose Metrics



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INTRODUCTION

Inpatient hyperglycemia is associated with prolonged hospital length of stay (LOS) and morbidity. Minimizing both hypo and hyperglycemic events are an overall strategy to avoid hospital complications related to dysglycemia.

Diabetic ketoacidosis (DKA) and stress related hyperglycemia are frequently managed in the critical care setting with IV insulin where guidelines recommend a blood glucose (BG) target of 140-180 mg/dL.

METHODS

We queried the EndoTool IV (ETIV) de-identified data base to quantify hypo and hyperglycemic events as a function of selected BG ranges.

ETIV is an insulin dosing algorithm that utilizes individual patient factors to adjust insulin dosing and allows provider selection of a range of target BG values.

In the year 2023, a total of 73,458 patient runs with IV insulin were studied. Target BG ranges fell into 4 major groups noted in Table 1.

BG Target Range	90-120 mg/dL	100-140 mg/dL	120-160 mg/dL	140-180 mg/dL
# Readings	160,675	466,993	288,185	545,824
# Runs	6,554	20,934	14,655	31,315
% Goal in Target Range	49.5	57.5	55.0	49.1
% BG < 70 mg/dL	0.60	0.39	0.22	0.16
% BG < 40 mg/dL	0.014	0.013	0.011	0.01
% BG > 180 mg/dL	4.2	7.3	12	23
Duration of IV Insulin (hours)	34.9	33.9	27.5	26.0
RR v BG 140-180 mg/dL	3.75	2.44	1.38	

Table 1. BG Target ranges in mg/dL with event rates for hyper and hypoglycemia, duration of IV insulin, and relative risk (RR) for hypoglycemia compared to BG 140-180 mg/dL. P-value for target ranges compared to BG 140-180 mg/dL were all < 0.05.

RESULTS

- No significant differences in number of BG checks, use of steroids or renal function was noted among the groups.
- There are highly statistically significant differences in more hypoglycemia between targets ranges compared to BG 140-180 mg/dL.
- Glycemic targets of 120-160 mg/dL and 140-180 mg/dL resulted in reduction in duration of IV insulin required, which contributes to time in ICU and LOS.

CONCLUSIONS

Best practices regarding optimal BG targets in critical care settings are evolving. Data presented suggests that for a heterogeneous patient population treated with IV insulin that target BG of 120-160 mg/dL with ETIV offers minimal hypoglycemic and hyperglycemic events with acceptable time in goal range.

REFERENCES

Available upon request.