

# Initiation of a Glucometrics Program to Improve Quality and Safety in Patients Receiving Intravenous Insulin

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## Background

- Glycemic control presents a challenge to inpatient clinicians caring for patients with or without diabetes whereby differing populations risk suboptimal outcomes secondary to hypoglycemia or hyperglycemia.
- Inpatient hyperglycemia represents an independent risk factor for mortality in the intensive care population and sternal wound infections after cardiothoracic (CT) surgery. Overcompensation for such hyperglycemia risks hypoglycemia which is associated with poor outcomes secondary to neuroglycopenia, cardiac arrhythmias, and other detrimental effects.
- The American Diabetes Association (ADA) recommends intermittent subcutaneous insulin for non-critically ill inpatients and intravenous insulin for critically ill patients with recent guidelines recommending moderate inpatient blood glucose (BG) control with a range of 140-180 mg/dL.
- The Institute for Safe Medication Practices considers both the subcutaneous and intravenous forms of insulin to be high alert medications and recommends an increased focus on developing practices to improve the quality of care and reduce the risk of errors in the care of patients receiving insulin.

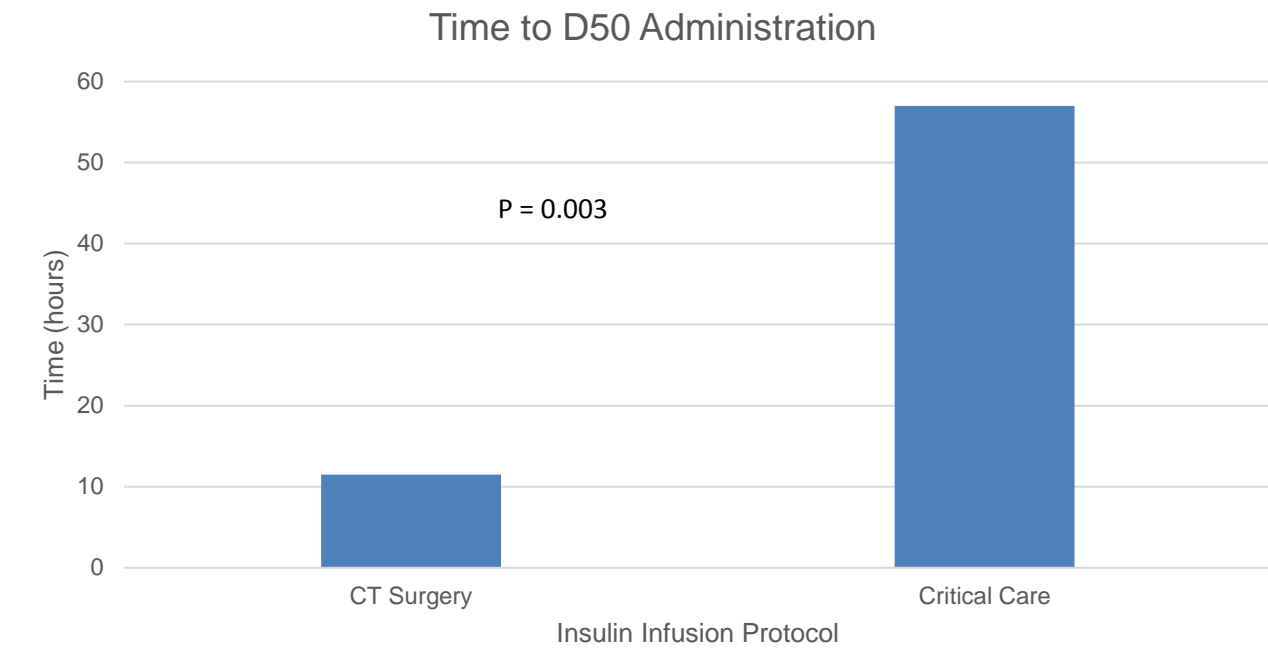
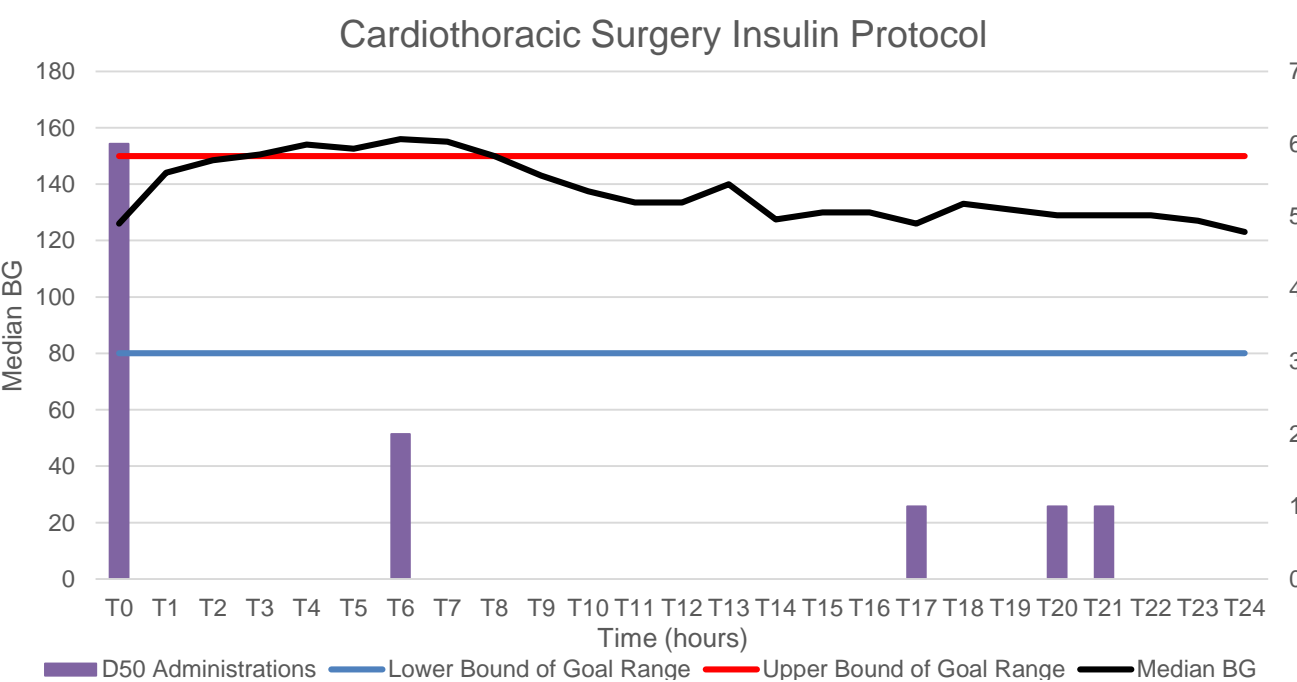
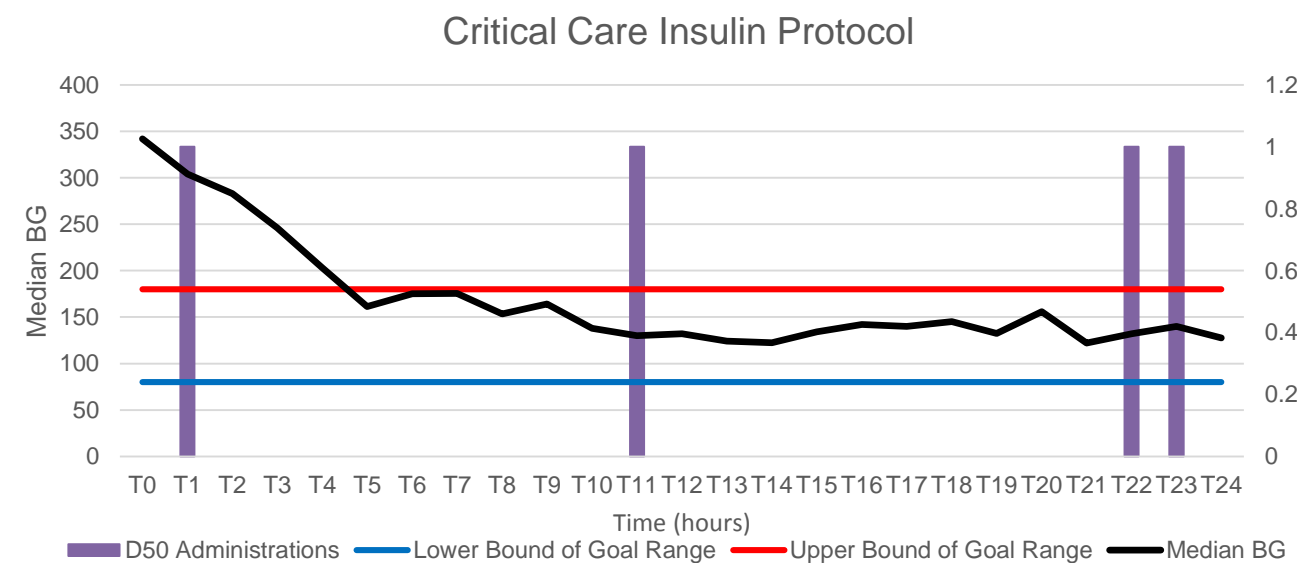
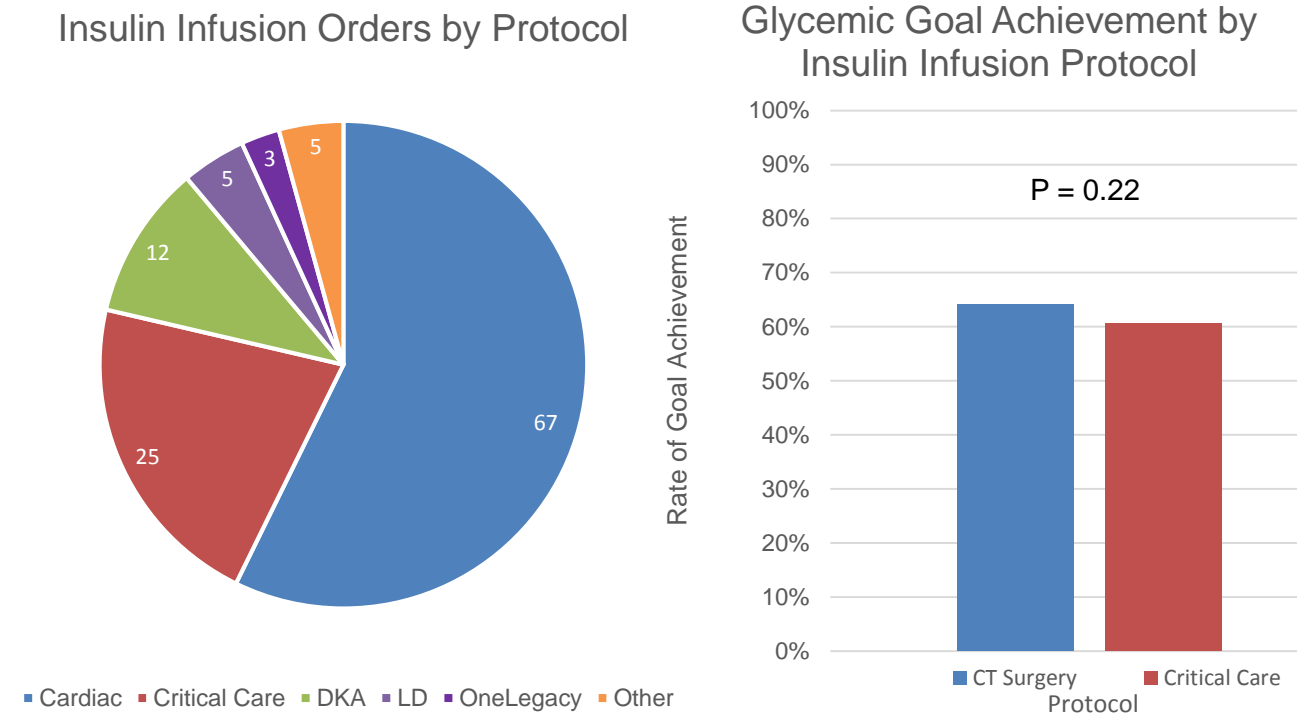
## Objectives

- Evaluate patient outcomes after receiving intravenous insulin infusions at a 523-bed tertiary care community hospital by examining longitudinal glycemic control.
- Describe incidence of hypoglycemia as indicated by rescue agent administration.

## Methods

- Mission Hospital retrospectively examined current insulin infusion protocols to determine trends in usage, outcomes, and opportunities to improve insulin usage and safety.
- Categorical data were analyzed using the chi square test and ordinal data were compared using the Mann-Whitney U test. Differences were considered statistically significant at an alpha level of < 0.05.

## Results



## Conclusions

- Current protocols do not reflect ADA-recommended goal ranges and may be leading to overcompensation and increased incidence of hypoglycemia given the lower goal range of 80 mg/dL.
- Time to D50 administration was notably shorter in patients receiving insulin for glycemic management in CT surgery as compared to critical care BG management.

## Limitations

- In cardiac surgery, insulin infusion protocol start criteria is within the normoglycemic range, but current guidelines do not agree on a target range across the cardiac surgery literature.
- Current Mission Hospital Critical Care lower limit BG goal less than current ADA recommendations.

## Future Directions

- Future actions pursuant to these findings include proposing revisions to insulin infusion protocols to reflect current literature, raising of lower BG target goals, and assessing patient outcomes subsequent to such modifications.
- Exploration of intraoperative intravenous insulin management practices to optimize immediate post-operative glycemic outcomes in the CT surgery population.