

# The clinical impact on glycemic control in non-critically ill hospitalized patients receiving a three times a day SSI protocol compared to those receiving four times a day SSI protocol

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## Background

- 34.2 million Americans have diabetes and 88 million American adults have prediabetes<sup>1</sup>
- 25-30% of hospitalized patients have a known diagnosis of diabetes<sup>1</sup>
  - 5-10% have an initial diagnosis discovered during admission
- Cost of diabetes and prediabetes is estimated to reach \$4.8 billion in Kentucky each year<sup>4</sup>
- The presence of hyperglycemia in hospitalized patients has been associated with prolonged hospital stay in addition to an increase in risk of complications, infection, and mortality<sup>2</sup>
- Minimal clinical trials that focus on optimal sliding-scale insulin (SSI) management in noncritical hospitalized patients<sup>3</sup>
- Research is needed to compare the clinical impact of mean glucose levels in patients receiving a three times daily SSI order to those receiving four times daily<sup>3</sup>

## Objectives

1. Compare mean glucose levels in patients receiving a three times daily SSI order to those who received four times daily
  - Mean AM fasting glucose levels throughout entire hospital admission
  - Mean daily random blood levels throughout entire hospital admission
  - Mean glucose during entire hospital stay
2. Assess daily overall insulin unit requirements
3. Compare the incidence of hypoglycemic and hyperglycemic events
  - Hypoglycemia defined as blood glucose <70 mg/dL and hyperglycemia defined as blood glucose >180 mg/dL
4. Investigate a composite endpoint of the difference in cost of insulin utilized between the groups

## Methods

- Single center, retrospective, cohort study of patients that utilized SSI during admission at Baptist Health Louisville
- Dates of data collection inclusion
  - Four times daily: July 1<sup>st</sup>-31<sup>st</sup> 2019
  - Three times daily: July 1<sup>st</sup>-31<sup>st</sup> 2020
- Data obtained from chart review of patient medical records

## Methods Continued

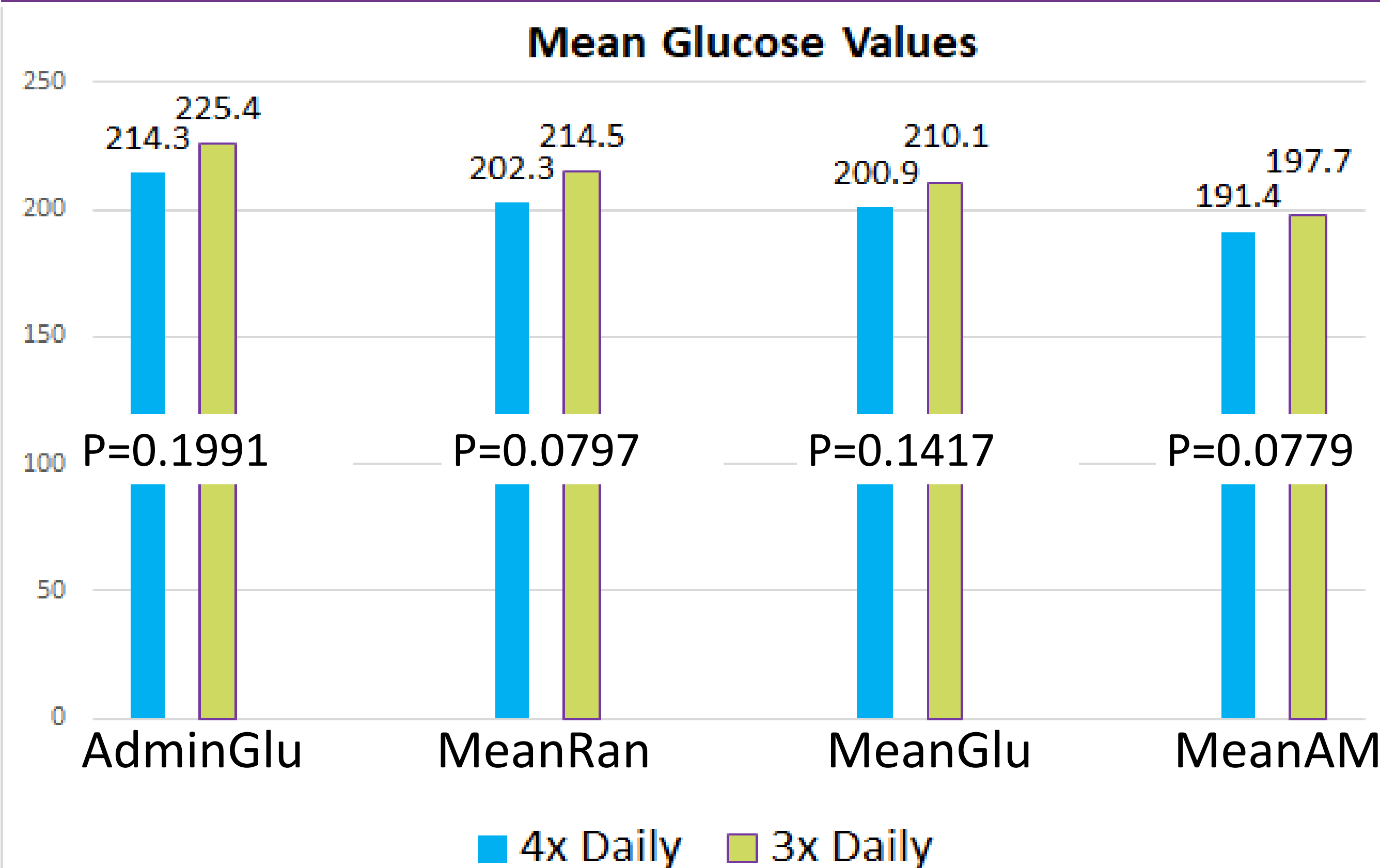
### Inclusion and Exclusion Criteria

Inclusion	Exclusion
• Patients 18 years of age or older	• Pregnancy
• Admitted to surgical or medical general service	• Receiving renal replacement therapy
• SSI ordered	• Usage of insulin pump
• Usage of SSI order set with at least one usage per day of admission	

## Data Analysis

- A sample size of 146 patients needed to meet power of 90%
  - 146 patients were included in the four times daily group
  - 146 patients were included in the three times daily group
- Alpha set at 0.05
- Binary endpoints were analyzed by means of Chi-square or Fisher's exact tests
- Continuous variables were compared with the use of t-test and Wilcoxon rank sum tests

## Results



- Comparison between (mean) 3 times daily vs. 4 times daily
  - Unit requirements: 144.1 vs. 121.4 (P=0.9486)
  - Hypoglycemic events: 0.3 vs. 0.2 (P=0.4669)
  - Hyperglycemic events: 10.4 vs. 9.4 (P=0.7539)

## Discussion

- High degree of external validity by evaluating many clinically important outcomes and utilizing limited exclusion criteria of our patient population
- Mean overall insulin use did not differ between groups despite the difference in number of administrations
- Days on regular diet was greater in the four times a day group compared to the three times a day (4.3 vs. 3.8, P= 0.0033) which likely correlates to the variation in length of stay
- Average cost of insulin per patient differs between groups
  - 3x daily: \$5.54 basal, \$3.34 SSI
  - 4x daily: \$4.85 basal, \$2.77 SSI
- Limitations of the study include:
  - Single-centered study with a patient population primarily including individuals >70 YOA
  - History of type-1 diabetes observed in 5.8% of population studied

## Conclusion

- Mean glucose values as well as the number of hyperglycemic and hypoglycemic events do not statistically differ between patients receiving a four times a day SSI protocol to those who receive three times a day
- Implementing a three times daily SSI protocol appears to be equivalent to a four times daily protocol in our study

## References

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### Disclosures

The authors of this poster presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have an interest in the subject matter included in this presentation



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