BACKGROUND

Hyperglycemia affects up to 40% of hospitalized patients and is associated with poor outcomes, including increased mortality, length of stay and surgical complications. The standard of care is intravenous (IV) insulin therapy for critically ill patients and subcutaneous (SubQ) basal bolus insulin therapy (BBI) for non-critically ill patients. However, despite best practice guidelines, recommendations from ADA and other associations for use of BBI, use of sliding scale insulin therapy (SSI) persisted at our medical center because of familiarity, lack of diabetes and endocrinology expertise, and concerns over hypoglycemia. Glytec’s eGlycemic Management System® (eGMS®) was selected to facilitate the conversion from SSI to BBI.

METHODS

This retrospective quality improvement case study compared N and SubQ insulin ‘usual care’ (UC) to that of the nurse-directed, computer-guided Glucommander (GM) solution, an FDA-cleared insulin dosing decision support module of eGMS that is integrated with our medical center’s electronic health record. The primary objective was to measure (with the support of hospital leadership) the clinical effort required to improve education for clinicians, increase utilization of BBI order sets, analyze inpatient glucose, and provide safer insulin management. Comparisons were made between pre-eGMS (baseline) data from calendar year 2015 and post-eGMS data from March 2016 through March 2017. Comparisons were also made between patients treated with UC and patients treated with GM during the first year of eGMS use at our medical center.

CLINICAL RESULTS

Upon implementing eGMS, our medical center converted to near-exclusive utilization of BBI in our inpatient population. First year results with the computer-guided Glucommander (GM) solution for BBI are as follows:

- **Hypercglycemia <70 mg/dL:** 2,434 fewer events with GM BBI vs UC SSI
- **Hypercglycemia >180 mg/dL:** 40,589 fewer events with GM BBI vs UC SSI
- **Number of Days on Basal Bolus Insulin Therapy:** 4.39 days (80% of total days)
- **Number of Total Insulin Dose Adjustments:** 69,256
- **Number of Bolus Insulin Dose Adjustments:** 0.84 per day (11,800 total)
- **Number of Basal Insulin Dose Adjustments:** 2.02 per day (28,377 total)
- **Number of Correction Dose Adjustments:** 2.07 per day (29,079 total)

**FINANCIAL RESULTS**

Use of eGMS in our medical center resulted in substantial reductions in the number of hypoglycemic events and the average length of stay, which contributed to total first year savings of $9,720,556.

**Long Stay Savings**

$2,079,200

**TOTAL Annualized Savings**

$9,720,556

**CONCLUSION**

Glycemic management vastly improved with use of eGMS in our medical center. The conversion from SSI to BBI supported by GM enhanced overall patient safety and eliminated the time and effort otherwise required when manually titrating insulin. By reducing hyperglycemia and length of stay with eGMS, we realized a first year savings of $9,720,556.