

# Characteristics of Patients Identified at High-Risk by a Hypoglycemia Prediction Model

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## Objective:

Hypoglycemia in hospitalized patients due to inappropriate insulin administration is one of the most serious and common adverse drug events and will soon become a Medicare measure of hospital quality. Our group previously developed an automated algorithm for identifying patients at high risk for drug-induced hypoglycemia. We have also recently developed a Nurse Practitioner led Inpatient Diabetes Service (IDS). This quality improvement study aimed to perform an initial evaluation of patients identified as high-risk by the hypoglycemia prediction algorithm in the 1,000-bed Shand's Hospital, University of Florida.

## Method:

The hypoglycemia prediction algorithm (heat-map) runs nightly on all adult patients prescribed with diabetes medication therapy in the Shand's Hospital. A cohort of eligible patients was observed between October 1<sup>st</sup> and 31<sup>st</sup> of 2019. We collected data patients at high risk of hypoglycemia (top 10% of the hypoglycemia risk based on the algorithm), patients seen by the IDS team, and hypoglycemic events defined as glucose of  $\leq 50$  mg/dl. We also evaluated the characteristics of the patients with hypoglycemic events including the number of times being reported on the heat-map prior to the event, having been seen by the IDS, IDS consult after the hypoglycemic event, and the location/primary medical service. Descriptive statistics were calculated as frequencies and mean  $\pm$  standard deviation.

## Result:

We observed  $163 \pm 9$  inpatient cases with diabetes medications per day during the study period. The mean number of patients reported on the heat-map per day was  $16 \pm 0.9$ . Of those on the heat-map, 60% had been on the heat-map prior and 25% had been seen by the IDS. We observed 45 hypoglycemic events in the cohort and the mean number of hypoglycemic events per day was  $1.5 \pm 1.0$  (range 0 to 4, median 1). Those patients with hypoglycemic events had been reported on the heat-map  $2.5 \pm 2.8$  times before the event (range 0-13, median 2). Among those with patients with a hypoglycemic event, the IDS team had seen 26.6% of them before the event. There were no consults to the IDS as a result of a hypoglycemic event. There were no obvious increases in risk for hypoglycemia by location or primary medical service.

## Conclusion:

Those patients with drug-induced hypoglycemic events were more frequently reported on the heat-map prior to the event which implies the predictive value of the model. Approximately 25% of patients received care from the IDS team. This observation suggests an opportunity to use the heat-map tool to recommend the IDS consult and provide quality insulin management for patients at a high risk of hypoglycemia.