

CASE STUDY: ENHANCING PATIENT SAFETY THROUGH A MULTIDISCIPLINARY APPROACH TO HYPOGLYCEMIA REDUCTION

Background

Hypoglycemia, or low blood glucose, is a serious and often preventable event for hospitalized patients. It can lead to significant complications, including seizures, falls, and even death. Effectively managing inpatient blood glucose is essential for ensuring patient safety, improving clinical outcomes, and reducing hospital stays and readmission rates. Furthermore, hypoglycemia is a key quality and safety metric tracked by national organizations, impacting hospital ratings and reimbursements. Preventing these events reflects a commitment to the highest standards of patient care.

Problem

Our institution aimed to improve performance on a key Vizient quality and safety metric related to inpatient care. This was prompted by poor performance on the metric, which identified an opportunity to reduce the rate of hypoglycemic events. The primary aim was to achieve a 20% reduction in the percentage of hospitalized adult patients experiencing a blood glucose level below 50 mg/dL following insulin administration.

Quality Improvement Methods

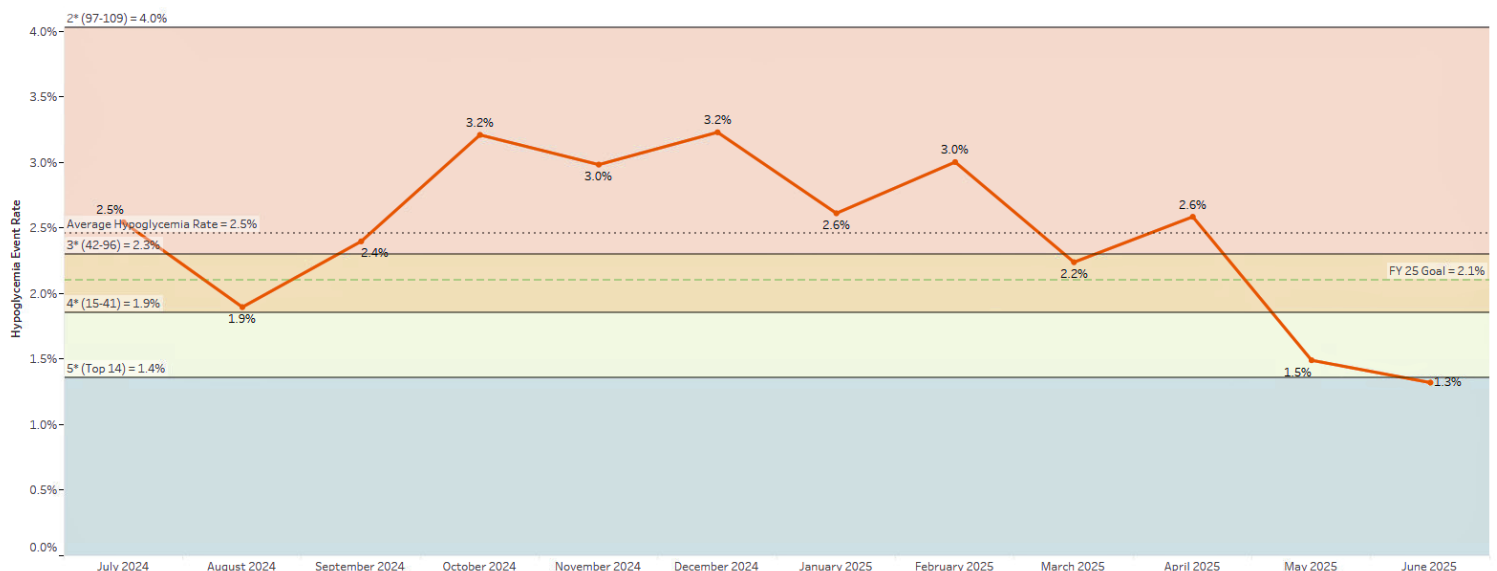
A multidisciplinary team was assembled to address this challenge, including endocrinologists, nurses, dietitians, diabetes educators, and quality improvement specialists. The team employed the Plan-Do-Study-Act (PDSA) cycle, a cornerstone of quality improvement, to facilitate continuous improvement through repeated testing and refinement of interventions. The process involved baseline data collection and monthly meetings to review individual cases of hypoglycemia, identify root causes, and discuss potential improvements.

Interventions

The team introduced several key process changes to reduce hypoglycemic events:

- **Triad Implementation:** A coordinated “triad” approach was introduced to synchronize the timing of food arrival, glucose measurement, and insulin administration, ensuring insulin is given when it is most effective and least likely to cause hypoglycemia.

Figure 1: FY 25 Metric Performance over Time and Vizient Goals (FY25 Periods 1-3 Comp AMC Data)



- **Basal Insulin Adjustment:** To mitigate risks associated with overly aggressive home medication regimens, the standard protocol was changed to reduce patients' home basal insulin dosages by 20% upon admission.
- **Standardized Weight-Based Insulin Dosing:** Weight-based insulin dosing was implemented to standardize care. This included specific care sets for different patient populations, such as starting basal insulin at 0.25 units/kg for patients with type 2 diabetes and 0.15 units/kg for those with type 1 diabetes or chronic kidney disease.
- **Data Monitoring and Visualization:** A run chart (Figure 1) was developed to visually track the timing of interventions against the rate of hypoglycemic events. Regular audits and monthly case reviews were also essential for monitoring adherence to new protocols and identifying areas for improvement.
- **Inpatient Glucose Targets:** These targets were based on the ADA Standards of Care (2024) and the AACE/ADA consensus, maintaining glucose levels between 140–180 mg/dL, with an emphasis on minimizing hypoglycemia. These targets were adopted in alignment with evidence from the NICE-SUGAR trial, which showed increased mortality with intensive glucose control, supporting the safety and effectiveness of more moderate glycemic goals.

Results

The implementation of these interventions, guided by the PDSA cycle methodology, led to a significant improvement in patient safety and quality metrics:

- While the initial intervention attempt was reducing basal insulin dose by 20%, weight-based insulin dosing, as an alternative, was more effective in reducing hypoglycemia events.
- **Reduction in Hypoglycemia Rate:** The project successfully achieved its goal, with a measurable reduction in the rate of hospitalized adult patients experiencing blood glucose levels below 50 mg/dL.
- **Vizient Score Improvement:** The successful outcome positively impacted the hospital's Vizient scores, reflecting an institutional commitment to excellence in healthcare delivery.

Key Takeaways

The success of this initiative underscores the importance of strategic planning, continuous monitoring, and multidisciplinary collaboration in quality improvement.

For clinicians looking to develop their own quality improvement projects, this model can be applied to other medication management challenges or quality measures. Start by assembling a diverse team with varied expertise and perspectives. Employ a methodical approach like PDSA cycles for data collection, intervention implementation, and continuous refinement. This framework ensures that interventions are tailored to the specific clinical context and can be improved based on real-time data and stakeholder feedback.

Leveraging data is critical. The use of run charts and regular case reviews provided the team with clear, actionable insights into the effectiveness of their interventions. Using data visualization and analysis facilitates timely adjustments, standardizes care, and ensures clear communication and accountability within the multidisciplinary team.

Conclusion

The sustained reduction in hypoglycemic events demonstrates the power of the PDSA cycle and multidisciplinary collaboration in enhancing patient safety and care quality. By implementing targeted interventions like the triad process and standardized weight-based insulin dosing, the project achieved its objectives, leading to safer patient care and improved performance on national quality benchmarks.

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