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Safety and Efficacy of a Patient-Specific Inpatient Dosing Application for Subcutaneous Insulin

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OBJECTIVE

- Clinicians reported positive outcomes using EndoTool IV for patients requiring intravenous insulin, including those with severe renal insufficiency. Within this experience, the incidence of severe hypoglycemia was reported as 0.018%.
- The hospital's analysis explored the use of **EndoTool SubQ (ETSQ)**, a computerized application for subcutaneous insulin dosing, and compared patient outcomes between those managed with ETSQ and those treated using a standard insulin order set.

METHOD

- **Hospital study period:** January to June 2025
- **Setting:** Academic medical center
- **Population:** Patients requiring subcutaneous insulin for blood glucose control

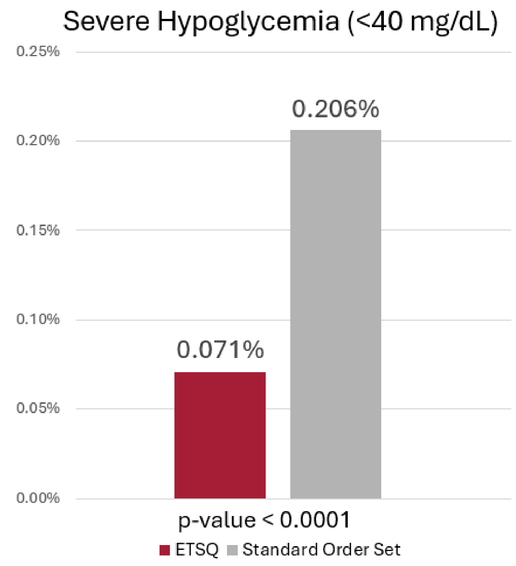
Groups:
- ETSQ dosing application
- Standard insulin order set

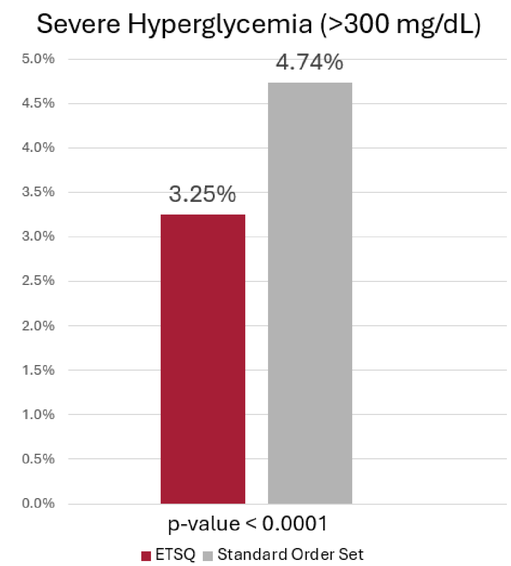
Outcomes measured:
- Severe hypoglycemia (< 40 mg/dL)
- Severe hyperglycemia (> 300 mg/dL)
- Subgroup analysis: Patients with eGFR < 10 mL/min (calculated using Levey et al., Ann Intern Med. 2009;150:604-612)

RESULTS

Patient population:
- ETSQ: 2,069 patients
- Standard order set: 949 patients

Renal Subgroup (eGFR < 10 mL/min)
- ETSQ-treated patients: n = 47
- Severe hypoglycemia: 0.0%
- Severe hyperglycemia: 6.14%
- (Data unavailable for standard group)





CONCLUSION

- Use of a **patient-specific subcutaneous insulin dosing application** was associated with significant reductions in both **severe hypoglycemia and hyperglycemia** (66% and 26% reductions, respectively) compared to standard insulin order sets.
- The system demonstrated **safe use in high-risk patients with advanced renal failure,** with **zero incidence of severe hypoglycemia** in this subgroup.
- These findings are especially relevant as hospitals prepare for **CMS mandates** focused on improving inpatient glycemic control and reducing preventable harm.

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