



A Clinical Nomogram for Early Identification of Patients at Risk for Delayed Discharge After Bariatric Surgery

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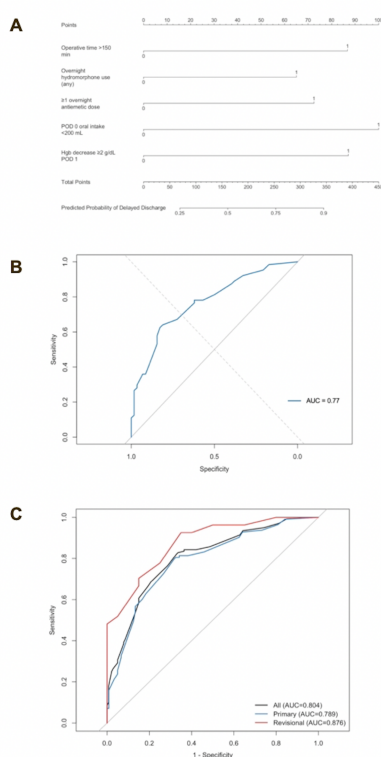
Introduction

- **Background:** ERAS pathways have reduced length of stay after bariatric surgery, yet a subset still require prolonged hospitalization
- **Knowledge gap:** No validated patient-level model exists to objectively predict delayed discharge after bariatric surgery
- **Rationale:** Objective postoperative metrics may standardize discharge readiness assessment
- **Aims:** Identify predictors of delayed discharge (>1 day), develop a clinical nomogram, and temporally validate across independent annual cohorts from our institution

Methods

- **Study design:** Retrospective single-center cohort at a military treatment facility (01/2022–12/2024)
- **Population:** Consecutive adults undergoing primary or conversion/revisional minimally invasive SG or RYGB
- **Outcomes:** Delayed discharge, defined as hospital stay >1 postoperative day; preoperative and perioperative predictors
- **Statistical analysis:** Multivariable logistic regression for predictors of delayed discharge in development cohort (2023); bootstrap internal validation; temporal validation in 2022 and 2024 cohorts; discrimination by area under the curve; nomogram development and reported sensitivity, specificity, positive predictive value, negative predictive value for delayed discharge

Figures



Disclosures: The authors declare no relevant financial relationships or conflicts of interest. The views expressed herein are those of the authors and do not necessarily reflect the official policy or position of the Defense Health Agency, Brooke Army Medical Center, the Department of Defense, or any agency of the United States Government.

Results

- **Cohort:** n=281 patients overall; 122 patients underwent bariatric surgery in 2023 and were included in regression analysis
- 55.9% underwent RYGB; 44.1% SG; 16.7% conversion or revision cases
- 50.2% experienced delayed discharge
- Baseline comorbidities similar between LOS groups
- **Independent predictors (multivariable model)**
 - Operative time >150 min (aOR 3.00)
 - Overnight hydromorphone use (aOR 3.78)
 - ≥1 overnight antiemetic dose (aOR 2.55)
 - POD 0 oral intake <200 mL (aOR 2.43)
 - POD 1 hemoglobin decrease ≥2 g/dL (aOR 4.16)
- Final five-variable model nomogram (**Figure A**)
- Good discrimination: AUC 0.77 (**Figure B and C**)
- At optimal probability threshold: sensitivity 0.63; specificity 0.83; PPV 0.80; NPV 0.67
- Bedside risk calculator developed for real-time and individual patient prediction:
<https://michaeltolson.shinyapps.io/bariatric-delayed-discharge-2023/>

Conclusions

- A simplified five-variable nomogram accurately predicts delayed discharge after bariatric surgery with robust performance across procedure types
- Early postoperative variables, not preoperative factors, may primarily drive discharge readiness