

**Malnutrition Is Predictive of Short-Term Postoperative Complications and Resource Utilization in Patients Undergoing Nonunion Fracture Repair of the Lower Extremity**

*Anna P. Meyer, MD; Roberto Hernandez-Irizarry, MD; Helyn G. Fraser, MD; Scott Holmes, MD; Corey Jones, MD; Jesse Seilern und Aspang, MD*

**Purpose:** This study aimed to explore the prevalence of malnutrition in patients undergoing nonunion fracture repair of the lower extremity and its association with short-term postoperative complications.

**Methods:** In this retrospective observational cohort analysis, 827 patients age  $\geq 18$  years undergoing nonunion fracture repair of the lower extremity between 2015 and 2020 were recruited from a national population-based surgery database (American College of Surgeons National Surgical Quality Improvement Program). Malnutrition (serum albumin levels  $< 3.5$  g/dL) and frailty status (5-item modified frailty index  $> 2$  points) were obtained preoperatively for each patient. The effects of these factors were assessed using postoperative complications and resource utilization, including prolonged hospital stay ( $> 2$  days), unplanned readmission, unplanned reoperation, and adverse hospital discharge. Four cohorts were used to stratify patients: malnourished, frail, malnourished and frail, and healthy (non-malnourished and non-frail). Statistical analyses were conducted to investigate the relationship between malnutrition/frailty and outcomes. Odds ratios (ORs) were reported with 95% confidence intervals (CIs).

**Results:** 508 (61.4%) were healthy, 133 (16.1%) were malnourished, 133 (16.1%) frail, and 53 (6.4%) were malnourished and frail. Malnourished and frail patients had the highest incidence of postoperative complications (28%), followed by malnourished (27%) and frail patients (24.8%). Malnourished, frail, and malnourished and frail patients had significantly higher resource utilization (length of stay, readmission, reoperation, adverse hospital discharge). However, when controlled for age, gender, American Society of Anesthesiologists classification, procedure duration, and location (femur/tibia), only malnourished patients revealed significantly higher odds of developing  $\geq 1$  complication (OR:2.3, CI:1.38-3.83) compared to healthy patients.

**Conclusion:** Findings indicate that malnutrition is an independent risk factor for postoperative complications and increased hospital utilization in patients undergoing lower extremity nonunion fracture repair. These data highlight potential utility of nutritional intervention in this unique subset of orthopaedic trauma patients, and may further warrant the implementation of preoperative albumin assessments, allowing for risk stratification and nutritional optimization before undergoing scheduled surgery.