

## Modified Frailty Index Is Predictive of Postoperative Morbidity and Mortality in Proximal Humerus Fracture Surgery

*Justin Everett Kleiner MD; Joseph Andrew Gil MD*

Brown University, Providence, RI, United States

**Purpose:** The objective of this investigation was to determine whether a 5-factor modified frailty index (mFI-5) was predictive of complications, readmission, and mortality following proximal humerus fracture surgery.

**Methods:** This retrospective cohort study used the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) data sets from 2007 to 2016. Patients with primary CPT code for operative intervention of proximal humerus fracture were included. Patients managed with closed or percutaneous treatment were excluded. Patients aged under 50 years old were excluded. mFI-5 was calculated as 1 point for each of the following comorbidities: history of COPD (chronic obstructive pulmonary disease), diabetes, CHF (congestive heart failure), hypertension, and partially or totally dependent functional status. Patients with mFI-5 greater than or equal to 2 were classified as high frailty. Univariable and multivariable regression were used to determine postoperative complications associated with general versus spinal anesthesia. Statistical significance was set at  $P < 0.05$ .

**Results:** From 2007 to 2016, 3393 proximal humerus surgeries were performed; 24.7% of patients were classified as high frailty. 30-day mortality (1.9% vs 0.5%) was significantly increased in frail patients ( $P < 0.01$ ) (Fig. 1). Hospital length of stay (4.1 days vs 2.9 days) was also significantly higher for frail patients. Mean operative time was similar for frail and non-frail patients (109.7 vs 112.3 minutes,  $P = 0.23$ ). 30-day hospital readmission (5.1% vs 3.7%,  $P = 0.11$ ) and 30-day complication rate (4.5% vs 3.7%,  $P = 0.39$ ) were not significantly elevated in frail patients. Rates of transfusion and pneumonia were significantly increased in frail patients ( $P < 0.01$ ). Rates of surgical site infection, wound dehiscence, deep venous thrombosis (DVT), urinary tract infection (UTI), and myocardial infarction were similar for frail and non-frail patients ( $P > 0.05$ ).

**Conclusion:** We demonstrated that a validated and clinically applicable 5-factor frailty index can identify patients at increased risk for mortality and complications following proximal humerus fracture surgery.