

## **A Prospective Analysis to Support the Use of an Abbreviated Frailty Index in Determining Discharge Outcomes in Orthopaedic Trauma Patients**

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**Purpose:** Numerous indices exist to quantify the degree of frailty in orthopaedic trauma patients, yet most are cumbersome and retrospectively generated. We sought to prospectively determine which modified frailty index [mFI] (5 vs 11 vs 15) best correlates with radiographic evidence of frailty and also predicts non-home discharges in an orthopaedic trauma population.

**Methods:** We prospectively analyzed all orthopaedic trauma patients from April to July 2019 who presented to our Level-I trauma center. We excluded patients <18 years, incarcerated or pregnant individuals, intubated patients, and anyone unable to provide consent. We obtained data on demographics, injury details, comorbidities, laboratory values, and CT evidence of sarcopenia (total psoas area) and myosteatosis (mean psoas radiodensity). The 3 frailty scores, mFI-5, -11, and -15, were calculated for each patient. Using logistic regression and an index of  $\geq 0.3$ , discharge dispositions (home, rehabilitation, facility [skilled nursing facility, long-term acute care hospital]) were assessed. Using multivariate analysis, each frailty index was represented as a continuous score and correlated with sarcopenia and myosteatosis. Spearman's rho coefficients were generated for each multivariate association. Receiver operating characteristic (ROC) curves were used to determine accuracy of each logistic regression modeling.

**Results:** There were 122 patients in the cohort; median age 47 years (range, 29-58), median ISS 10 (9-17), and 64.8% male (n = 79). At discharge, 73% patients (n=89) went home, 9% (n = 11) went to a facility, and 18% (n = 22) went to rehabilitation. On logistic regression, only mFI-5 significantly predicted a non-home discharge (odds ratio [OR] 3.8, 95% confidence interval [CI] 1.5-9.8, P = 0.006); ROC 61.4%. For the mFI-5, accounting for concomitant hypoalbuminemia increased these odds (OR 15, 95% CI 1.7-133.7, P = 0.02). The mFI-11 (ROC curve 53%) and mFI-15 (ROC curve 54%) were not associated with a non-home discharge. On multivariate analysis, the mFI-5 (rho -0.24, P = 0.04) and mFI-11 (rho -0.25, P = 0.03) significantly correlated with sarcopenia, while the mFI-15 did not (rho -0.21, P = 0.07). Additionally, the mFI-5 (rho -0.44, P <0.0001) and mFI-11 (rho -0.44, P <0.0001) similarly correlated with myosteatosis while the mFI-15 did not (rho -0.16, P = 0.16).

**Conclusion:** We prospectively demonstrated that a non-home discharge in frail, orthopedic trauma patients is associated with an mFI-5  $\geq 0.3$  and potentiated by hypoalbuminemia. The mFI-5 is not only the most accurate of the three indices as evidenced by its highest ROC, but also demonstrates equivalent correlations with radiographic sarcopenia and myosteatosis as the mFI-11. Future orthopedic triage efforts should emphasize the mFI-5 given its simplicity and greater accuracy.