# Six-Item Modified Frailty Index Independently Predicts Complications Following Total Shoulder Arthroplasty

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INTRODUCTION: In the realm of orthopedic surgery, frailty has been associated with higher rates of complications following total hip and total knee arthroplasties. Among various measures of frailty, the six-item modified frailty index (MF-6) has recently gained popularity as a predictor for postoperative complications. This purpose of this study was to investigate MF-6 as a predictor for early postoperative complications in the elderly patient population following total shoulder arthroplasty (TSA).

METHODS: The authors queried the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database for all patients who underwent TSA between 2015 and 2020. Patient demographics and comorbidities were compared between cohorts using bivariate logistic regression analysis. Multivariate logistic regression, adjusted for all significantly associated patient demographics and comorbidities, was used to identify associations between MF-6 score and postoperative complications.

RESULTS SECTION: 9,228 patients were included in this study: 8,764 (95.0%) had MF-6 < 3 and 464 (5.0%) patients had MF-6 ≥ 3. Multivariate analysis found MF-6 ≥ 3 to be independently associated with higher rates of UTI (OR 2.79, 95% CI 1.49-5.23; p = 0.001), blood transfusion (OR 1.53, 95% CI 1.01-2.32; p = 0.045), readmission (OR 1.58, 95% CI 1.06-2.35; p = 0.024), and non-home discharge (OR 2.60, 95% CI 2.08-3.25; p < 0.001).

DISCUSSION: A high MF-6 score (≥ 3) in patients 65 and older is independently associated with higher rates of UTI, blood transfusion, readmission, and non-home discharge following TSA. Limitations of this study include limitations to the data available on NSQIP, such as data limited to the 30-day postoperative period. The MF-6 score can be easily calculated preoperatively and may allow for better preoperative risk stratification.

SIGNIFICANCE/CLINICAL RELEVANCE: As the surgical volume of TSA increases in the elderly population, understanding the predictive value of frailty scores for postoperative complications may help to optimize outcomes.

IMAGES AND TABLES:

Table 1. Bivariate analysis of complication rates between normal and high MF-6 (≥ 3) scores.

| Complication | Normal (MF-6 < 3) | | MF-6 ≥ 3 | | |
| --- | --- | --- | --- | --- | --- |
| | Number | Percent | Number | Percent | p-value |
| Urinary tract infection | 64 | 0.73% | 14 | 3.02% | **<0.001** |
| Blood transfusion | 199 | 2.27% | 34 | 7.33% | **<0.001** |
| Deep vein thrombosis | 25 | 0.29% | 2 | 0.43% | 0.574 |
| Sepsis | 8 | 0.09% | 1 | 0.22% | 0.418 |
| Readmission | 276 | 3.15% | 32 | 6.90% | **<0.001** |
| Reoperation | 110 | 1.26% | 13 | 2.80% | **0.006** |
| Non-home discharge | 985 | 11.24% | 157 | 33.84% | **<0.001** |
| Mortality | 19 | 0.22% | 2 | 0.43% | 0.355 |

SSI, surgical site infection

Table 2. Multivariate analysis of complication rates between normal and high MF-6 (≥ 3) scores.

| Complication | Odds Ratio | 95% CI | p-value |
| --- | --- | --- | --- |
| Urinary tract infection | 2.79 | 1.49-5.23 | **0.001** |
| Blood transfusion | 1.53 | 1.01-2.32 | **0.045** |
| Readmission | 1.58 | 1.06-2.35 | **0.024** |
| Reoperation | 1.58 | 0.86-2.93 | 0.142 |
| Non-home discharge | 2.60 | 2.08-3.25 | **<0.001** |

CI, confidence interval