



# Are The Days Gone That Age Mattered?

## A National Level Comparison of Frailty vs. Age in Predicting Postoperative Outcomes

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### Introduction

- Older adults are the fastest growing demographic in the US and are at increased risk for postoperative complications due to age-related comorbidities. Frailty, characterized by decreased physiological reserve, is an important predictor of adverse surgical outcomes.
- Direct comparisons between these factors remain limited in the general surgery population at a national level.
- This study evaluates the association between age, frailty, and surgical outcomes in older adults undergoing low-, intermediate-, and high-risk procedures.

### Hypothesis

- Frailty is more strongly associated with adverse postoperative outcomes than chronological age

### Methods

- This is a retrospective study of the 2022 NSQIP database.
- We included older adult patients (≥50 years) undergoing general surgery procedures, stratified by the surgical risk (low, intermediate, and high).
- Patients were stratified based on decades of age and modified frailty index (mFI-5) score.
- Our primary outcome was 30-day mortality and secondary outcomes included 30-day readmission and major complications.
- Cohen's kappa statistics was used to assess the agreement between age and frailty categories.
- Multivariable logistic regression (MLR) analysis was used to compare the strength of the independent association of frailty versus age with postoperative outcomes.

### Results

#### Overall Outcomes Analysis:

- 94,882 patients were included, with a mean (SD) age of 66 (10) years. The majority of our study population were white and male. Hypertension was the most common comorbidity followed by diabetes

#### Regression Analysis:

- While both increasing frailty and age were associated with higher independent odds of major complications and unplanned readmissions, increasing frailty score had higher adjusted odds of major complications and unplanned readmission compared to age.
- Increasing frailty score was significantly associated with higher odds of 30-day mortality; while, increasing age was not.

#### 30-Day Mortality by Surgical Risk:

- Frailty was significantly associated with 30-day mortality among all surgical risk groups. As surgical risk decreased, the association of frailty and 30-day mortality increased.
- Chronological age showed no statistically significant association with 30-day mortality among any of the surgical risk sub-group analysis.

#### Correlation Analysis:

- Cohen's kappa coefficient was 0.089, indicating poor agreement between frailty score and age category.

**Tables 1-2: Outcomes Frailty vs Age**

Outcome	Frailty Score			Age		
	aOR	95% CI	P-value	aOR	95% CI	P-value
<b>30-day Mortality</b>	1.522	1.349-1.717	<.001	1.049	0.931-1.182	0.430
<b>Major Complications</b>	1.321	1.292-1.352	<.001	1.125	1.103-1.148	<.001
<b>30-day Readmissions</b>	1.317	1.274-1.362	<.001	1.094	1.061-1.127	<.001

**Table 1.** Multivariate Regression Analysis of Outcomes of Study Population Stratified Based on Frailty and Age Category, adjusting for potential confounding factors, including the surgical risk

Surgical Risk	Frailty Score			Age		
	aOR	95% CI	P-value	aOR	95% CI	P-value
<b>Low-Risk</b>	2.279	1.766-2.942	<.001	11.169	1.766-2.942	0.222
<b>Intermediate-Risk</b>	1.465	1.212-1.771	<.001	0.998	0.828-1.202	0.981
<b>High-Risk</b>	1.245	1.022-1.517	0.04	1.008	0.825-1.23	0.941

**Table 2.** Multivariate Sub-Analysis of 30-day Mortality Sub-Stratified Based on Surgical Risk Levels

### Discussion

- Frailty demonstrated a stronger and more consistent association with adverse postoperative outcomes, including 30-day mortality, major complications, and unplanned readmissions, compared to chronological age.
- Notably, frailty was identified as an independent predictor of 30-day mortality, whereas age was not.
- There was no correlation between age and frailty, demonstrating that chronological age and frailty status rarely stratify patients similarly, emphasizing that age is NOT an adequate proxy for frailty.

### Conclusion

- Frailty was superior to chronological age in predicting major complications, unplanned readmissions, and 30-day mortality, becoming even more influential in low-risk procedures.
- Increasing frailty, not age, was found to be significantly associated with 30-day mortality.
- There is no association between frailty and age
- Frailty, rather than age, should guide patient selection and risk assessment in older patient populations
- For more information:**



### References

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