Pre-operative optimization of surgically frail patients can improve outcomes and prognosis

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RESEARCH QUESTION

- Which components of the Edmonton Frailty Scale score (EFS) are most associated with with surgical optimization, and thereafter, clinical outcome?
- Furthermore, are there any identifiable optimization components that can be feasibly implemented across the general surgical population?

BACKGROUND

- The state of surgical patients pre-operatively has been significantly associated with post-operative clinical outcomes
- Components such as cognitive function, mechanical functionality, pre-existing health conditions, etc. have been associated with surgical prognosis, independent of the surgery type
- Standardized scales and scores have been published to assist in determining the state of pre-operative patients, as predictors of surgical outcomes
- The Edmonton Frailty Scale was used for this preliminary study

METHODS

- EFS scores were correlated to optimization components and compared to objective outcome measurements.
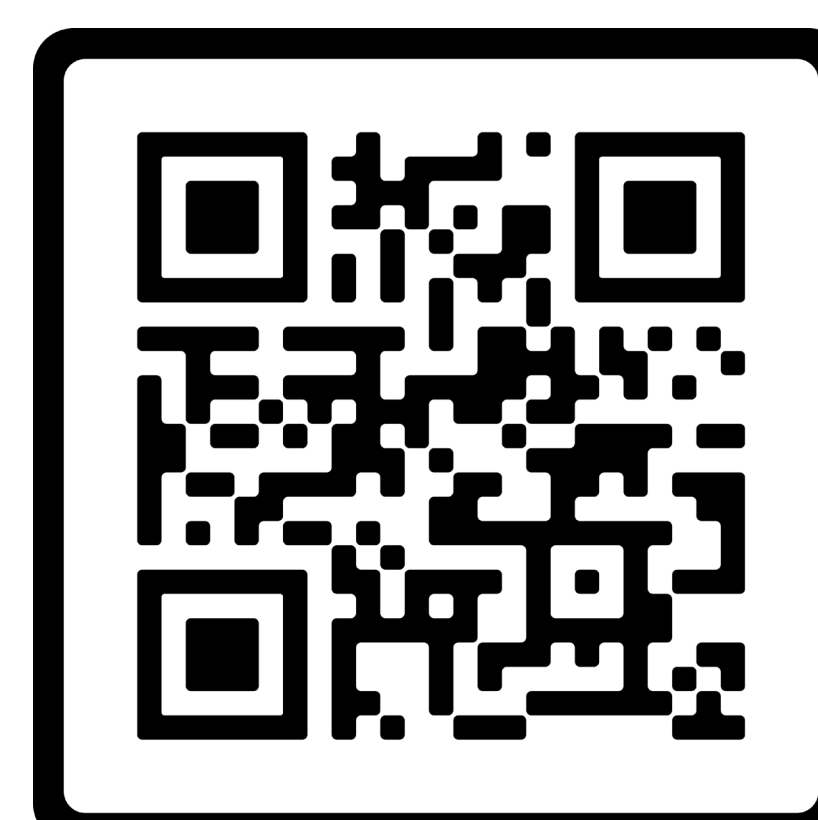
Main Points:

1. Diabetes and hypertension were most associated with an increase in EFS score
2. Increased EFS score was associated with worse post-operative outcomes

Figure 1: Main outcomes with clinical associations to EFS scores

Comparison	Outcome	Experimental Interpretation
EFS to Length of Stay	Negative Correlation	Lower EFS Proceeds to Surgery
EFS to Time to Surgery	Positive Correlation	Allowing More Time for Optimization is Beneficial
EFS to Proceeding to Surgery	Negative Correlation	Decreasing EFS Leads to Proceeding to Surgery
EFS to ICU Admission	Positive Correlation	Higher EFS Leads to ICU Admission
EFS to Hypertension	Positive Correlation	Hypertension is Associated with Higher EFS
EFS to Diabetes	Positive Correlation	Diabetes is Associated with Higher EFS
EFS to Hypertension & Diabetes	Positive Correlation	Hypertension and Diabetes are Associated with Higher EFS

Figure 2: EFS Score Components

Frailty domain	Item	0 point	1 point	2 points
Cognition	Please imagine that this pre-drawn circle is a clock. I would like you to place the numbers in the correct positions then place the hands to indicate a time of 'ten after eleven'	No errors	Minor spacing errors	Other errors
General health status	In the past year, how many times have you been admitted to a hospital?	0	1–2	≥2
	In general, how would you describe your health?	'Excellent', 'Very good', 'Good'	'Fair'	'Poor'
Functional independence	With how many of the following activities do you require help? (meal preparation, shopping, transportation, telephone, housekeeping, laundry, managing money, taking medications)	0–1	2–4	5–8
Social support	When you need help, can you count on someone who is willing and able to meet your needs?	Always	Sometimes	Never
Medication use	Do you use five or more different prescription medications on a regular basis?	No	Yes	
	At times, do you forget to take your prescription medications?	No	Yes	
Nutrition	Have you recently lost weight such that your clothing has become looser?	No	Yes	
Mood	Do you often feel sad or depressed?	No	Yes	
Continence	Do you have a problem with losing control of urine when you don't want to?	No	Yes	
Functional performance	I would like you to sit in this chair with your back and arms resting. Then, when I say 'GO', please stand up and walk at a safe and comfortable pace to the mark on the floor (approximately 3 m away), return to the chair and sit down'	0–10 s	11–20 s	One of : >20 s , or patient unwilling , or requires assistance
Totals	Final score is the sum of column totals			

Scoring :
0 - 5 = Not Frail
6 - 7 = Vulnerable
8 - 9 = Mild Frailty
10-11 = Moderate Frailty
12-17 = Severe Frailty

TOTAL ____ /17

Administered by : ____

Figure 3: Breakdown of patients with hypertension compared to diabetes

Risk Factor	Total Patients	Percent of Patients
Hypertension	80	55.56%
Diabetes	60	41.67%
Both	32	23.08%

Figure 4: Risk factors as associated to EFS scores

Risk Factor	EFS Score
Hypertension	8.04
Diabetes	8.21
Both	8.07
Neither	7.41

RESULTS

- Hypertension and diabetes were the most reports risk factor that was associated with EFS scores and negative post-operative outcomes (Figure 1).
- Hypertension and diabetes were identified as factors that could be adjusted to improve EFS, and thus, surgical outcomes.

FUTURE DIRECTIONS

- As a preliminary study, the data and results hope to lay foundation for identified trends in the population (Figure 5).

Figure 5: Proposed future directions based on available variables.

Area of Future Research	Research Components
Patient Demographic	Healthcare literacy, socioeconomic status, transportation availability, & job title
Independent Hospital Admission	Reasons for hospitalizations outside of optimization encounters
Qualitative Stratification	Analyzing each component within the systems-based bins
Overlapping Risk Factors	Stratifying the multiple components that fall within multiple bins
Time to Surgery Variables	Filtering and identifying multiple components influencing time to surgery
Optimization Components for Diabetes/Hypertension	Continued improvement on management of diabetes and hypertension

ACKNOWLEDGEMENTS