JAMA Surgery | Original Investigation | PACIFIC COAST SURGICAL ASSOCIATION

Association of Frailty With Morbidity and Mortality in Emergency General Surgery by Procedural Risk Level

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IMPORTANCE In this aging society, older patients are more commonly undergoing emergency general surgery (EGS). Although frailty has been associated with worse outcomes in this population, EGS encompasses a heterogeneous mix of procedures.

OBJECTIVE To determine if the association of frailty with morbidity and mortality in EGS patients varies based on the level of procedural risk.

DESIGN, SETTING, AND PARTICIPANTS This cross-sectional study analyzed Medicare inpatient claims file (January 2007-December 2015) and included all inpatients who underwent 1 of 7 previously described EGS procedures shown to represent 80% of EGS volume, complications, and mortality nationally. Analysis took place from September 2019 to January 2020.

EXPOSURES The primary exposure of interest was risk procedural level. EGS procedures were stratified as high risk (excision of small intestine, excision of large intestine, peptic ulcer repair, lysis of peritoneal adhesions, and laparotomy) and low risk (appendectomy and cholecystectomy).

MAIN OUTCOMES AND MEASURES The primary outcome was overall 30-day mortality after discharge. Frailty was assessed using a claims-based frailty index. Multivariate logistic regression analysis was used and was stratified by risk level.

RESULTS A total of 882 929 EGS patients were included in this study (mean [SD] age, 77.9 [7.5] years; 483 637 [54%] were female). Overall mortality was 4.5% (n = 40 304). The frailty index classified 12.6% (n = 111 513) of patients as frail, and mortality within this group was 9.9% (n = 11 307). High-risk procedures represented 53% (n = 468 098) of the caseload, and mortality was 6.8% (n = 31 979). For low-risk procedures, mortality was 2% (n = 8325). Frailty was significantly associated with mortality (odds ratio, 1.64; 95% CI, 1.60-1.68). After stratified analysis, this association remained significant for high-risk (odds ratio, 1.53; 95% CI, 1.49-1.58) and low-risk (odds ratio, 2.05; 95% CI, 1.94-2.17) procedures.

CONCLUSIONS AND RELEVANCE Frailty was significantly associated with mortality in patients undergoing EGS, with an even greater association in low-risk procedures. Preoperative frailty assessment is imperative even in low-risk procedures.

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JAMA Surg. 2021;156(1):68-74. doi:10.1001/jamasurg.2020.5397
Published online November 25, 2020.

Patients undergoing emergency general surgery (EGS) are more likely to die and to have a postoperative complication compared with those undergoing elective surgery.[1-3] Globally, the population is aging rapidly, with those 65 years and older growing faster than any other age group. Additionally, it has been shown that this age group has higher rates of surgery compared with others.[4,5] Consequently, the inherent risk of having an emergency procedure combined with older age results in worse outcomes and the utilization of more resources.[6-8] However, other factors besides age need to be considered. Prior research has shown that frailty is a better predictor of mortality and morbidity compared with chronological age in this population.[9]

Frailty has been defined as an aging-related state of vulnerability to poor outcomes.[10-12] Frailty can be conceptualized as a measure of physiologic reserve; as a consequence, frail older adults are less able to adapt and respond to stressors, such as acute illness or trauma, resulting in decompensation.[4,8] Although the prevalence of frailty varies with the tool used, population-based studies have shown a positive association between frailty and age.[1] As more older patients undergo surgery, frailty becomes a more important contributor to outcomes in the EGS setting.

The effect of frailty in morbidity and mortality after elective procedures has been extensively studied; however, its contribution to adverse postoperative outcomes after EGS has been recently established.[2,7,13-15] This can be partially explained by the recent standardized definition of EGS, which includes 7 procedures that represent a majority of the EGS operative burden.[3] However, the risk of complications and death differs greatly between these procedures.[16] For example, appendectomy and cholecystectomy have much lower morbidity and mortality rates compared with the others, although they represent the largest proportion of cases.[16] Therefore, our goal was to determine if the increased burden of morbidity and mortality of frailty in EGS patients varied based on the level of procedural risk.

Key Points

Question Is level of procedural risk associated with frailty and mortality in emergency general surgery patients?

Findings In this cross-sectional study of 882 929 emergency general surgery admissions, frailty was significantly associated with mortality. After stratified analysis, this association remained significant for high-risk procedures, and it was even greater within low-risk procedures.

Meaning Procedural risk level is associated with frailty and mortality in emergency general surgery patients, and preoperative frailty assessment should be strongly considered even within low-risk procedures.

Methods

Database

Patient data were obtained from the 100% Medicare Limited Data set inpatient file from January 2007 to December 2015. These administrative file claims contain data on encounters with the health care system of more than 55 million Medicare beneficiaries, which include US individuals 65 years or older. Each individual patient gets assigned a unique patient identifier, which allows the linkage of multiple admissions during the study. This study was approved by the Partners Healthcare Institutional Review Board, and patient consent was not needed.

Study Cohort

We included all adults (aged ≥65 years) who underwent an EGS procedure and survived to hospital discharge. These previously defined procedures were laparotomy (only cases with no secondary procedure were included), surgical treatment of ulcer of stomach or duodenum, lysis of adhesions, excision of small intestine, appendectomy, colectomy, and cholecystectomy.[3] Patients who had an urgent or emergent admission and had surgery within 48 hours of admission were included. Patients with concurrent EGS procedures were excluded from the analysis.

Patient and Hospital Characteristics

Demographic characteristics such as age, sex, and race/ethnicity were collected. The Charlson Comorbidity Index (CCI) score, a validated score that uses 19 possible diagnoses to assess the association between mortality and perioperative complications in longitudinal data, was calculated and was considered as a continuous variable.[17]

Patient data were linked to the American Hospital Association Annual Survey, which provided data on hospital structural features. Hospital characteristics included teaching status (teaching vs nonteaching), hospital bed size (<200 vs ≥200 beds), and geographic location (South, Midwest, Northeast, West).

Exposure Assessment

Our main exposure was risk procedural level. We divided EGS procedures into high and low risk. Based on earlier work from our group, appendectomy and cholecystectomy were defined as low risk, and laparotomy, colectomy, small-bowel resection, peptic ulcer repair, and lysis of adhesions were defined as high risk.[16]

To define frailty, we used a claims-based frailty index modeled off the Rockwood Frailty Index. This index has been previously validated using Medicare data.[18,19] The claims-based frailty index, with values from 0 to 1 (higher indicates more frailty) was determined by assigning defined weights to 93 administrative codes for durable medical equipment claims, comorbid conditions, and health care facility use in the 12 months preceding an admission. A cutoff score of 0.25 or higher was considered to determine if a patient was frail. Therefore, patients with a claims-based frailty index score less than 0.25 were considered not frail and those with a score of 0.25 or higher were deemed frail.

Outcomes Assessment

Mortality within 30 days of discharge was the main outcome of interest. This was extracted from the Medicare

Table 1. Characteristics of Patients With vs Without Frailty After Emergency General Surgery

Variable	Frail (n = 111 513)	Not frail (n = 771 416)	*P* value
Age, median (IQR), y	79.9 (73.6-85.5)	77.1 (71.3-83.4)	<.001
Sex			
Female	69 547 (62.4)	414 090 (53.7)	<.001
Male	41 966 (37.6)	357 326 (46.3)	
Race/ethnicity			
White	95 056 (85.2)	683 812 (88.6)	<.001
Black	11 211 (10.1)	49 225 (6.4)	
Other[a]	5246 (4.7)	38 379 (5.0)	
CCI score, median (IQR)	3 (2-5)	0 (0-2)	<.001
Teaching hospital status			
Teaching	16 254 (14.6)	108 038 (14.0)	<.001
Nonteaching	95 259 (85.4)	663 378 (86.0)	
No. of hospital beds			
0-199 (Small)	32 470 (29.1)	240 609 (31.2)	<.001
≥200 (Large)	79 043 (70.9)	530 807 (68.8)	
Type of surgery			
Cholecystectomy	37 677 (33.8)	304 767 (39.5)	<.001
Appendectomy	3350 (3.0)	69 037 (9.0)	
Laparotomy	1960 (1.8)	9796 (1.3)	
Colectomy	20 610 (18.5)	135 198 (17.5)	
Lysis of adhesions	11 007 (9.9)	74 507 (9.7)	
Peptic ulcer repair	27 318 (24.5)	108 657 (14.1)	
Small-bowel resection	9591 (8.6)	69 454 (9.0)	

Abbreviations: CCI, Charlson Comorbidity Index; IQR, interquartile range.

[a] The other category includes Asian, Hispanic, and North American Native.

Beneficiary Summary File. Secondary outcomes included discharge disposition (home vs other) and readmission.

Data Analysis

t Tests and χ^2 tests were performed for comparisons between continuous variables and categorical variables, respectively. Initially, risk factors associated with mortality were identified using logistic regression. All covariates with a *P* value of .10 or less or those that were considered potential confounders were included in model building. Covariates included in model building were age, sex, race/ethnicity, CCI score, number of hospital beds, hospital region, hospital teaching status, and type of EGS procedure. All variables had complete data for nearly all patients (approximately 99%), and complete cases analyses were used. The association of frailty and mortality was then determined by using multivariate logistic regression, adjusting for previously described covariates. We then performed a stratified analysis by procedural risk level (high risk vs low risk) to determine if there was a change in the association of frailty and mortality. Moreover, because these EGS procedures include both the laparoscopic and open approach and the use of laparoscopy reduces morbidity and mortality, we performed a sensitivity analysis to examine the association between outcome and frailty for laparoscopic procedures vs open. Statistical analyses were conducted using Stata version 15 (StataCorp), and the threshold for statistical significance was set at 2-sided $P < .05$. Analysis took place from September 2019 to January 2020.

Results

Population

We included 882 929 patients who underwent an EGS procedure. The mean (SD) age was 77.9 (7.5) years, 483 637 (54%) were female, and 778 868 (88.21%) were White. High-risk procedures represented 53% (n = 468 098) of the caseload. Cholecystectomy (342 444 [38.78%]) was the most common procedure, followed by colectomy (155 808 [17.65%]) and peptic ulcer repair (135 975 [15.40%]).

Frail vs Nonfrail Patients

Of all EGS patients, 111 513 (12.63%) were deemed frail. There were significant differences in demographics and clinical characteristics between frail and nonfrail patients (**Table 1**). Frail patients were less likely to be female, younger, and White than nonfrail patients ($P < .001$). However, they were more likely to have a higher CCI score compared with nonfrail patients ($P < .001$) (Table 1). Regarding hospital characteristics, frail patients were more likely to be seen at teaching and larger hospitals ($P < .001$) (Table 1). While other variables were statistically significant, the difference might not have been clinically meaningful. Chole-

cystectomy and large-bowel resection were the most common procedures among nonfrail patients. However, cholecystectomy and surgical treatment of ulcer were the most common procedures in frail patients. Of patients undergoing high-risk procedures, 70 486 (15.06%) were frail. Among patients undergoing low-risk procedures, 41 027 (9.89%) were deemed frail. Frail patients were significantly more likely to be readmitted (40 516 [36%] vs 146 592 [19%]; $P < .001$) compared with nonfrail patients. Frail patients were significantly less likely to be discharged home (27 878 [25%] vs 439 707 [57%]; $P < .001$) compared with nonfrail patients.

Frailty and Mortality

Overall mortality for the entire cohort was 4.5% (n = 40 304). In unadjusted analysis, frail patients were more likely to die (11 037 [9.90%] vs 29 267 [3.79%]; $P < .001$) compared with nonfrail patients. Within high-risk procedures, overall mortality was 6.83% (31 979 of 468 098), and frail patients were more likely to die than nonfrail patients (8620 [12.23%] vs 23 359 [5.87%]; $P < .05$). Within low-risk procedures, overall mortality was 2.01% (8325 of 414 831), and frail patients were more likely to die than nonfrail patients (2417 [5.89%] vs 5908 [1.58%]; $P < .05$).

In adjusted analysis (controlling for patient- and hospital-level characteristics), frailty was independently associated with mortality (adjusted odds ratio [aOR], 1.64; 95% CI, 1.60-1.68). We also found that age (OR, 1.05; 95% CI, 1.05-1.06), sex (OR, 0.87; 95% CI, 0.86-0.89), CCI score (OR, 1.16; 95% CI, 1.15-1.16), hospital volume (OR, 0.94; 95% CI, 0.92-0.97), and hospital teaching status (OR, 0.86; 95% CI, 0.83-0.89) were associated with mortality ($P < .001$) (**Table 2**).

After stratified analysis, the association between frailty and mortality remained significant within patients undergoing high-risk procedures (aOR, 1.53; 95% CI, 1.49-1.58; $P < .001$) (**Table 3**) and low-risk procedures (aOR, 2.05; 95% CI, 1.94-2.17; $P < .001$) (**Table 4**). This association was greater in low-risk procedures.

Sensitivity analysis showed that results were similar when stratifying by laparoscopic vs open approach. Within laparoscopic procedures, frailty was significantly associated with mortality in patients undergoing high-risk procedures (aOR, 1.38; 95% CI, 1.29-1.46; $P < .001$) and low-risk procedures (aOR, 2.08; 95% CI, 1.95-2.23; $P < .001$). Within open procedures, frailty was also significantly associated with mortality in patients undergoing high-risk procedures (aOR, 1.63; 95% CI, 1.58-1.69; $P < .001$) and low-risk procedures (aOR, 1.91; 95% CI, 1.71-2.13; $P < .001$). Regardless of surgical approach, the association of frailty and mortality remained significant and was greater in low-risk procedures.

Table 2. Multivariate Analysis of Mortality After Emergency General Surgery

Variable	Odds ratio (95% CI)	*P* value
Age, y	1.05 (1.05-1.06)	<.001
Sex		
Male	1 [Reference]	NA
Female	0.87 (0.86-0.89)	<.001
Race/ethnicity		
White	1 [Reference]	NA
Black	0.93 (0.90-0.97)	.99
Other[a]	0.87 (0.83-0.92)	<.001
CCI score	1.16 (1.15-1.16)	<.001
Frailty status		
Not frail	1 [Reference]	NA
Frail	1.64 (1.60-1.68)	<.001
Teaching hospital status		
Nonteaching	1 [Reference]	NA
Teaching	0.86 (0.83-0.89)	<.001
Hospital size		
≥200 Beds (large)	1 [Reference]	NA
0-199 Beds (small)	0.94 (0.92-0.97)	<.001
Region		
West	1 [Reference]	NA
Northeast	0.87 (0.84-0.91)	<.001
Midwest	1.07 (1.03-1.10)	<.001
South	1.16 (1.12-1.20)	<.001
Type of surgery		
Small-bowel resection	1 [Reference]	NA
Cholecystectomy	0.31 (0.30-0.32)	<.001
Appendectomy	0.19 (0.18-0.21)	<.001
Laparotomy	1.99 (1.87-2.11)	<.001
Colectomy	1.14 (1.11-1.18)	<.001
Lysis of adhesions	0.58 (0.55-0.60)	<.001
Peptic ulcer repair	0.62 (0.60-0.64)	<.001

Abbreviations: CCI, Charlson Comorbidity Index; NA, not applicable.

[a] The other category includes Asian, Hispanic, and North American Native.

Discussion

Our study found that 13% of older patients undergoing EGS were frail, of which 10% died. Frail patients had higher rates of mortality, readmission, and were more likely to be discharged to a facility other than home. Mortality was higher among patients undergoing high-risk EGS procedures. Additionally, we found that frailty was independently associated with mortality and this association was stronger within low-risk procedures, regardless of operative approach. This suggests that even EGS procedures associated with less complex intraoperative and postoperative care may require better planning for frail patients. As far as we know, no previous studies have evaluated the effect of EGS procedural risk level in the association of frailty and mortality.

Our findings are congruent with other studies of frailty in surgical patients.[14,20,21] McIsaac et al[6] found that preoperative frailty-defining diagnoses were associated with a significantly increased risk of 1-year mortality following major elective noncardiac surgery. Moreover, Farhat et al[22] found that a frailty index was an important predictive variable in EGS patients older than 60 years. However, we need to emphasize that the emergent or urgent quality of the cases determines a difference in the care provided compared with those performed

Table 3. Multivariate Analysis of Mortality After High-Risk Emergency General Surgery Procedures

Variable	Odds ratio (95% CI)	*P* value
Age, y	1.05 (1.04-1.05)	<.001
Sex		
Male	1 [Reference]	NA
Female	0.87 (0.85-0.89)	<.001
Race/ethnicity		
White	1 [Reference]	NA
Black	0.90 (0.86-0.94)	.04
Other[a]	0.91 (0.85-0.97)	.21
CCI score	1.15 (1.15-1.16)	<.001
Frailty status		
Not frail	1 [Reference]	NA
Frail	1.53 (1.49-1.58)	<.001
Teaching hospital status		
Nonteaching	1 [Reference]	NA
Teaching	0.88 (0.85-0.91)	<.001
Hospital size		
≥200 Beds (large)	1 [Reference]	NA
0-199 Beds (small)	0.93 (0.91-0.96)	<.001
Region		
West	1 [Reference]	NA
Northeast	0.89 (0.85-0.93)	<.001
Midwest	1.07 (1.03-1.18)	<.001
South	1.15 (1.11-1.20)	<.001
Type of surgery		
Small bowel resection	1 [Reference]	NA
Laparotomy	1.96 (1.84-2.08)	<.001
Colectomy	1.14 (1.11-1.18)	<.001
Lysis of adhesions	0.58 (0.56-0.61)	<.001
Peptic ulcer repair	0.63 (0.60-0.65)	<.001

Abbreviations: CCI, Charlson Comorbidity Index; NA, not applicable.

[a] The other category includes Asian, Hispanic, and North American Native.

Table 4. Multivariate Analysis of Mortality After Low-Risk Emergency General Surgery Procedures

Variable	Odds ratio (95% CI)	*P* value
Age, y	1.07 (1.07-1.08)	<.001
Sex		
Male	1 [Reference]	NA
Female	0.89 (0.85-0.93)	<.001
Race/ethnicity		
White	1 [Reference]	NA
Black	1.10 (1.01-1.21)	<.001
Other[a]	0.80 (0.72-0.89)	<.001
CCI score	1.17 (1.16-1.18)	<.001
Frailty status		
Not frail	1 [Reference]	NA
Frail	2.05 (1.94-2.17)	<.001
Teaching hospital status		
Nonteaching	1 [Reference]	NA
Teaching	0.75 (0.70-0.82)	<.001
Hospital size		
≥200 Beds (large)	1 [Reference]	NA
0-199 Beds (small)	0.99 (0.94-1.04)	.84
Region		
West	1 [Reference]	NA
Northeast	0.83 (0.76-0.90)	<.001
Midwest	1.06 (0.98-1.13)	.01
South	1.16 (1.09-1.24)	<.001
Type of surgery		
Cholecystectomy	1 [Reference]	NA
Appendectomy	0.68 (0.63-0.73)	<.001

Abbreviations: CCI, Charlson Comorbidity Index; NA, not applicable.

[a] The other category includes Asian, Hispanic, and North American Native.

electively. We also need to take into account that older patients, on top of the acute surgical condition, are more likely to have chronic diseases. This combination limits the time necessary for the appropriate patient optimization before the surgical procedure. For elective surgeries, planning allows more time to optimize the patient and have a more detailed discussion as part of the shared decision-making process, which has been shown to lead to better outcomes in frail patients. However, since EGS is becoming more prevalent in frail older patients, there is a need for tailored strategies to accurately and promptly evaluate the full risk of this specific population. Although several interventions focused on exercise, nutrition, and drug therapies have been implemented as part of the patient optimization process before elective surgery, greater efforts are needed to facilitate this process in emergent situations.[23] Our data suggest several specific opportunities to improve patient care. These include rigorous evaluation of frailty specific risk; thorough discussions between patients, families, and the surgical team to determine whether or not to have the operation; and the type of care needed postoperatively.

The association between frailty and mortality varied based on the risk category of the EGS procedure. Unexpectedly, this effect modification was more pronounced on EGS procedures with low risk level (appendectomy and cholecystectomy), which usually require less complex care and having lower risk-adjusted odds of mortality compared with high-risk procedures. It is also worth noting that frail individuals undergoing a low-risk procedure have about the same risk as nonfrail individuals undergoing a high-risk procedure, which effectively suggests that in a frail patient even appendectomy and cholecystectomy are high risk. Interestingly, these results were similar even after stratifying for laparoscopic and open procedures. However, we need to consider that some of the excess mortality in the open procedure group could be reduced by using a laparoscopic approach because minimally invasive techniques have been shown to have a clear benefit in elderly patients. This is especially true in frail patients whose recovery can be greatly compromised by more invasive procedures.[24]

A possible explanation for the effect modification previously described could be that because these procedures are known to have lower morbidity and mortality, they are not truly deemed as high risk, and consequently, being frail did not have a definitive weight toward the decision to proceed with the operation. Therefore, being frail did not necessarily affect the surgical team's eagerness to perform a low-risk less complex procedure in a patient with a high baseline risk. Within the elective surgery setting, Shinall et al[25] reported an analogous pattern, where there was a stronger association between frailty and mortality in frail patients undergoing low-stress procedures (ie, total joint replacement) compared with those undergoing moderate-high stress procedures such as liver, kidney, and pancreatic surgery. Consequently, risk stratification in the preoperative setting must include a proactive evaluation of frailty by all perioperative clinicians, regardless of the complexity or risk of the procedure.[23]

Our results suggest that frailty screening should be applied universally because even low-risk procedures may be high risk among patients who are frail. In these situations, some interventions can be helpful. First, risks associated with frailty should be thoroughly discussed with patients as part of the shared decision-making process. If electing to pursue surgical intervention, patient optimization could be targeted if possible, within the short available time. Also, geriatric comanagement would be one strategy to reduce postoperative complications such as delirium.[26,27] Moreover, geriatric nursing protocols can improve mobility and reduce functional decline in these patients.[26]

Limitations

Our study has several limitations. The Medicare inpatient file claims database includes a group of homogeneous insured patients older than 65 years; thus, this may limit the generalizability of our findings. Similar to all administrative databases, Medicare claims do not contain more detailed clinical data for more appropriate risk adjustment. We considered that including the frailty index and CCI score in our adjusted analysis addressed this limitation at least partially. However, these score calculations are reliant on coding and cannot be validated against actual patient data. Additionally, the term *laparotomy* was used to represent patients who had a *Current Procedural Terminology* code for laparotomy and no secondary code; thus, they may represent either negative or nontherapeutic laparotomy. Although we are unable to know which, this system has been well established in the literature.[3,16] Another important limitation is that there are no available data ascertaining the cause of death in these patients. We also acknowledge that the score we used to determine frailty was mainly developed as a research tool and it was not intended for clinical use. Therefore, it cannot be used at the bedside because of the requirement for extensive administrative data. However, this claims-based metric has been validated against some common tools more easily applicable in the clinical setting.[19]

Conclusions

This study showed that frailty was significantly associated with mortality in patients undergoing EGS, with an even greater association in low-risk procedures. Preoperative frailty assessment is imperative even in low-risk procedures. Further studies should focus on identifying areas of improvement to provide better care for this frail population undergoing EGS.

ARTICLE INFORMATION

Accepted for Publication: September 1, 2020.

Published Online: November 25, 2020. doi:10.1001/jamasurg.2020.5397

Author Contributions: Drs Castillo-Angeles and Havens had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.
Concept and design: All authors.
Acquisition, analysis, or interpretation of data: Castillo-Angeles, Cooper, Jarman, Sturgeon, Havens.
Drafting of the manuscript: Castillo-Angeles, Havens.
Critical revision of the manuscript for important intellectual content: Castillo-Angeles, Cooper, Jarman, Sturgeon, Salim.
Statistical analysis: Castillo-Angeles, Jarman, Sturgeon, Havens.
Administrative, technical, or material support: Sturgeon, Havens.
Supervision: Cooper, Salim, Havens.

Conflict of Interest Disclosures: Dr Havens reports grants from Medical Devices and Diagnostic Global Services outside the submitted work. No other disclosures were reported.

Funding/Support: Dr Cooper receives funding from the American Federation for Aging Research and the Paul B. Beeson Emerging Leaders Career Development Award in Aging (grant K76-AG054859-01).

Role of the Funder/Sponsor: The funders had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Meeting Presentation: This study was presented at the 91st Annual Meeting of the Pacific Coast Surgical Association; February 15, 2020; Carlsbad, California.

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Invited Commentary

If the Patient Is Frail, Emergency Abdominal Surgery Is High Risk

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When a patient with frailty undergoes a high-risk emergency procedure, an increased incidence of adverse events is expected. Castillo-Angeles and colleagues' study[1] in this issue of *JAMA Surgery* validates this belief but also demonstrates that frailty is associated with worse outcomes even after low-risk procedures. In their analysis of more than 880 000 emergency general surgery procedures captured in the Medicare Inpatient Claims files (from 2007 through 2015), the authors[1] found that patients with frailty were twice as likely to die within 30 days of discharge following low-risk emergency surgery (appendectomy or cholecystectomy). This risk was much higher than a 53% increase in odds of mortality after high-risk emergency surgery (exploratory laparotomy, lysis of adhesions, bowel resection, or peptic ulcer repair). Consistent with results of another recent study,[2] which examined the association of frailty with outcomes following laparoscopic cholecystectomy for acute cholecystitis, these findings indicate that there is no such thing as a low-risk intra-abdominal operation for a patient with frailty.

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Without an opportunity to optimize the health of a patient with frailty prior to emergency general surgery, special attention must be paid to patients with frailty in the postoperative period, regardless of the perceived risk of adverse events. It is quite telling that patients with frailty had higher readmission rates. Data regarding length of stay, reason for readmission, and cause of mortality could guide care redesign to improve outcomes. Lack of such data is a limitation of the study.[1] Nonetheless, the study[1] calls attention to a number of considerations. Are we potentially providing suboptimal care in the postoperative period for patients with frailty undergoing what we consider low-risk surgery, resulting in increased mortality? Are patients with frailty being discharged too prematurely for their high-risk status? Is it time to consider a new postoperative standard of care for a patient with frailty undergoing any surgical procedure?

The study by Castillo-Angeles et al[1] certainly adds to emerging evidence for the need to assess frailty in any patient undergoing emergency abdominal surgery. Although the authors[1] used a claims-based frailty index, they recognize that this is not feasible in real time and suggest the use of standard frailty scales to aid decision-making prior to emergency surgery. There are a number of validated screening tools for frailty;[3-6] however, one wonders how often surgical professionals can objectively assess and document frailty or surrogates of frailty in the emergency setting and postoperative period. Perhaps signals for risk of frailty should be flagged in the electronic medical record to identify those in need of closer attention. Overall, this study[1] suggests that in emergency general surgery, preop-