The Role of Frailty in Trauma & Surgery

Bellal Joseph MD, FACS
Professor and Chief of Surgery
Division of Trauma and Acute Care Surgery
Nothing to Disclose
125 years

109 all the time
Twenty Years Ago in the Journal of Trauma

Differences in Mortality between Elderly and Younger Adult Trauma Patients: Geriatric Status Increases Risk of Delayed Death

Perdue, Phillip W. MD, MPH; Watts, Dorraine D. RN, PhD; Kaufmann, Christoph R. MD, MPH; Trask, Arthur L. MD


Article

Background: Elderly patients suffer higher mortality rates after trauma than younger patients. This increased mortality is attributable to age, preexisting disease, and complications as well as injury severity.

Methods: Records from 5,120 adult patients from a Level I trauma center were retrospectively reviewed. Injury Severity Score (ISS), Revised Trauma Score (RTS), early mortality (<24 hours), and late mortality (>24 hours) were determined for elderly (>65 years) and younger (16-64 years) patients. Preexisting diseases and complications were identified by International Classification of Diseases, Ninth Revision, Clinical Modification, diagnosis coding.

Results: Mortality in elderly patients was twice that in younger patients despite equivalent injury severity (p < 0.001), and elderly patients were more likely to suffer earlier death than younger patients (p < 0.005). The prevalence of preexisting disease was greater in the elderly, as was the incidence of complications. Using logistic regression, ISS, RTS, preexisting cardiovascular or liver disease, the development of cardiac, renal, or infectious complications, and geriatric status were all independently predictive of late mortality (p < 0.05).

Conclusion: Elderly trauma patients more frequently suffer late mortality than younger patients because of the combination of injury and increased preexisting disease and complications after injury. Aggressive treatment of the elderly trauma patient is warranted, however, if the rates of significant preexisting disease or complications survival is less likely. Predictive models of survival can be developed, taking into account preexisting disease and complications as well as admission parameters such as age, ISS, and RTS, and the specific risk of mortality quantified.

How Have we Changed in 2018?

Elderly patients suffer Mortality after trauma compared to younger patients.

In 1998 this was found to be Attributable to:
- Preexisting disease
- Higher incidence of complications
- Increased Age

What variables are we using now?
Surgery in the Geriatric Patient
Aging, the Heart, Emergencies, and Us

Michael E. Zenilman, MD


Yes, things are looking good for our elderly patients and us aging surgeons. As we understand the aging process and create safer environments, we can get our patients through complex surgery with acceptable morbidity and mortality. Now we need to start to recognize other curve balls our elderly patients throw us, which when controlled can improve survival even more—issues like dementia, delirium, polypharmacy, unrecognized alcoholism or abuse, and the need for dedicated geriatric services. The American College of Surgeons and the American Geriatrics Society have teamed up to increase research and awareness in these areas. There is a lot we do not know, that we weren't taught, and that we need to study. Maybe next time I'll go to the next level and talk about nursing homes.
TRANSFORMATION

• Marked change in form, nature, appearance process by which one figure or function is converted into another one of SIMILAR VALUE
Focus is Shifting
INTRODUCTION

Expectations
INTRODUCTION

Reality
SILVER SERVICE

GERIATRIC

How Do you Decide ICU, Geriatric, Rehab

Family Discussions – Objective Data

Quality Hospital/Surgeon Data
INTRODUCTION

Why Should We Distinguish Geriatric Patients?
Trauma

- Extrication
- Transfusion
- Protocol
- Intubation
- FAST
- Burns
- Traumatic brain injury
- GCS
- Injury severity score
- Cardiac Arrest
- Falls
- Vasopressors
Geriatric Trauma

Dementia
Extrication
hypertension
anxiety

Transfusion
Depression
vasopressors

Incontinence
cirrhosis

Protocol
osteoporosis

Falls
FAST
Burns
Parkinson's

Morbidity
Intubation
Malignancy

Delirium
GCS
Injury severity score

Traumatic brain injury

Cardiac Arrest

Extrication
Falls

Intubation
Malignancy

Chronic kidney disease

Presbycusis
Cardiac Arrest

INTRODUCTION
Improving Mortality Following Emergency Surgery in Older Patients Requires Focus on Complication Rescue
Kyle H. Sheetz, Seth A. Waits, Robert W. Krell, Darrell A. Campbell, Jr., Michael J. Englesbe, and Amir A. Ghaferi

In Elderly:

↑ Major Complications

↑ Mortality

↑ Failure to Rescue
Normal Aging

- Muscle strength
- Respiratory Function
- Nutrition
Hospitalization

- Mobilization
- Plasma Volume
- Bone Loss
Deconditioning

- Dehydration
- Delirium
- Fall
- Function status
Frailty

Which life are you designing?
Frailty:

- Osteoporosis
- Weight loss
- Adverse drug reactions
- Cognitive impairment and dementia
- Disability
FINDING REASONS GIVING INDIVIDUALS IMEL CONSUMING YEARS
FRAILTY

A syndrome of **Physiological Decline** that affects all organ systems.

- Clinically recognizable state with Increased Vulnerability
- Age-associated declines in physiologic reserve and function across multiple organ systems.
- **Independent of**
  - Age
  - Functional disability
AGING vs FRAILTY

Graph showing the relationship between performance, frailty, and disability over time (age). The graph illustrates two scenarios:

1. "Normal aging": A smooth decline in performance, leading to frailty, and eventually disability.
2. "Accelerated aging": A more rapid decline in performance, leading to frailty and disability earlier in life.

The graph highlights the time-window for frailty and the progression from normal aging to frailty and disability.
SARCOPENIA
• Skeletal muscle loss
• Poor muscle quality

Physical Function Impairment
• Weak muscle strength
• Slow gait speed
• Poor balance

FRAILTY
• Deficits accumulation
• Fatigue
• Sedentary behavior
• Weight loss
• Cognitive impairment
• Social isolation
Non-Frail

Frail
FRAILTY

Reduced Physiological Reserve

Genetics

Poor nutrition

Dysregulated Hemostasis

Environment

Reduced physical activity

Comorbidities

Increasing age

Frailty

Hospital admission, prolonged hospitalization, slow recovery

Falls, fractures, poor mobility, loss of independence, need for long term care

Procedural complications, poor healing, higher morbidity and mortality

Acute event / illness

Surgery
HOW TO MEASURE FRAILTY?
### FRIED’S Index

**Frailty Domains**

- Changes in everyday activity
- Head and neck problems
- Poor muscle tone in neck
- Problems getting dressed
- Problems with bathing
- Problems with grooming
- Urinary incontinence
- Problems with toileting
- Bulk difficulties
- Rectal problem
- Gastrointestinal problems
- Problems cooking
- Sucking problems
- Problem going out alone
- Impaired mobility
- Musculoskeletal problems
- Bradykinesia of the limbs
- Poor tone in limbs
- Poor trunk coordination trunk
- Poor standing posture
- Irregular gait pattern
- Falls

### ROCKWOOD’S

**Criteria**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Frailty Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>0</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>1</td>
</tr>
<tr>
<td>Weakness</td>
<td>2</td>
</tr>
<tr>
<td>Exhaustion</td>
<td>3</td>
</tr>
<tr>
<td>Low physical activity</td>
<td>4</td>
</tr>
<tr>
<td>Slowness</td>
<td>5</td>
</tr>
</tbody>
</table>

**Interpretation of the Frailty Score**

The patient receives 1 point for each criterion:

0–1 = Not Frail
2–3 = Intermediate Frail (Pre-frail)
4–5 = Frail

Frail patients are at much higher risk of death and institutionalization than other patients.

Intermediate frail patients are at elevated risk for complications and at more than double the risk of becoming dependent.

**See Appendix III for a more detailed description.**

### ACS Frailty Score

**Frailty Criteria**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight loss</td>
<td>Unintentional weight loss ≥10 pounds in the past year.</td>
</tr>
<tr>
<td>Decreased grip strength</td>
<td>Grip strength in the lowest 20th percentile by gender and BMI. Three trials are performed with a hand-held dynamometer and the average is used.</td>
</tr>
</tbody>
</table>

**Interpretation of the Frailty Score**

For the following two statements:

- "I felt that everything I did was an effort."
- "I could not get going."

The patient is asked: "How often in the last week did you feel this way?"

- 0 = rarely or none of the time (<1 day)
- 1 = some or a little of the time (1–2 days)
- 2 = a moderate amount of the time (3–4 days)
- 3 = most of the time

The criteria are met if patient answers 2 or 3 to either statement.

**Low physical activity**

Weekly energy expenditure, determined with the short version of the Minnesota Leisure Time Activities Questionnaire (see Taylor et al.,34) in the lowest 20th percentile by gender:

- Men: <383 kcal/week
- Women: <270 kcal/week

**Slowed walking speed**

Walking speed in the lowest 20th percentile by gender and height. Time is measured for a distance of 15 feet at normal pace. The average of three trials used.

<table>
<thead>
<tr>
<th>Height</th>
<th>Time</th>
<th>Height</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤173 cm</td>
<td>≥27 sec</td>
<td>≤159 cm</td>
<td>≥27 sec</td>
</tr>
<tr>
<td>&gt;173 cm</td>
<td>≥26 sec</td>
<td>&gt;159 cm</td>
<td>≥26 sec</td>
</tr>
</tbody>
</table>
### Table 2. Trauma Specific Frailty Index (TSFI)

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Fifteen Variable</th>
<th>Trauma Specific Frailty Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer history</td>
<td>YES (1)</td>
<td></td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>MI (1) Medication (0.25)</td>
<td></td>
</tr>
<tr>
<td>Dementia</td>
<td>Severe (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td></td>
</tr>
<tr>
<td>Daily Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help with grooming</td>
<td>Yes (1)</td>
<td></td>
</tr>
<tr>
<td>Help managing money</td>
<td>Yes (1)</td>
<td></td>
</tr>
<tr>
<td>Help doing housework</td>
<td>Yes (1)</td>
<td></td>
</tr>
<tr>
<td>Help toileting</td>
<td>Yes (1)</td>
<td></td>
</tr>
<tr>
<td>Help walking</td>
<td>Wheelchair (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td></td>
</tr>
<tr>
<td>Health Attitude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel less useful</td>
<td>Most time (1)</td>
<td></td>
</tr>
<tr>
<td>Feel sad</td>
<td>Most time (1)</td>
<td></td>
</tr>
<tr>
<td>Feel effort to do everything</td>
<td>Most time (1)</td>
<td></td>
</tr>
<tr>
<td>Falls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within last month (1)</td>
<td></td>
</tr>
<tr>
<td>Feel lonely</td>
<td>Most time (1)</td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual active</td>
<td>Yes (0)</td>
<td></td>
</tr>
<tr>
<td>Nutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>&lt;3 (1)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2. EGS Specific Frailty Index (EGSFI)

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Fifteen Variable</th>
<th>EGS Specific Frailty Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer history</td>
<td>YES (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>YES (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>MI (1) Medication (0.25)</td>
<td>CABG (0.75) PCI (0.5)</td>
</tr>
<tr>
<td>Dementia</td>
<td>Severe (1)</td>
<td>Moderate (0.5) Mild (0.25)</td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td></td>
</tr>
<tr>
<td>Daily Activities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help with grooming</td>
<td>Yes (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Help managing money</td>
<td>Yes (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Help doing housework</td>
<td>Yes (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Help toileting</td>
<td>Yes (1)</td>
<td>No (0)</td>
</tr>
<tr>
<td>Help walking</td>
<td>Wheelchair (1)</td>
<td>Walker (0.75) Cane (0.5)</td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td></td>
</tr>
<tr>
<td>Health Attitude</td>
<td></td>
<td></td>
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<tr>
<td>Feel less useful</td>
<td>Most time (1)</td>
<td>Sometimes (0.5) Never (0)</td>
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<td>Feel effort to do everything</td>
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<td>Sometimes (0.5) Never (0)</td>
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<tr>
<td>Function</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual active</td>
<td>Yes (0)</td>
<td>No (1)</td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Albumin</td>
<td>&lt;3 (1)</td>
<td>&gt;3 (0)</td>
</tr>
</tbody>
</table>
Novel Wearable Technology for Assessing Spontaneous Daily Physical Activity and Risk of Falling in Older Adults with Diabetes

Frailty Meter™
A SIMPLE ARM TEST TO ASSESS FRAILTY
Quantitative frailty assessment that does not require walking or self-rated health and activity measures
FRAIL scale

- F___atigue
- R___esistance (ability to climb one flight of stairs)
- A___mbulation (ability to walk one block)
- I___llnesses (Greater than 5)
- L___oss of Weight (>5%)

0 = robuste | 1-2 = pre-frail | ≥ 3 = frail
Injury In The Aged: Geriatric Trauma Care at the Crossroads

Rosemary A. Kozar, MD, PhD, Saman Arbabi, MD, MPH, Deborah M. Stein, MD, MPH, Steven R. Shackford, MD, Robert D. Barraco, MD, MPH, Walter L. Biffl, MD, Karen J. Brasel, MD, MPH, Zara Cooper, MD, MSc, Samir M. Fakhry et al/

- **No consensus** on which frailty score is best to use across all clinical settings
- **Scores lack feasibility** → require assessment of up to 30 to 70 variables
- Due to the limitations of current frailty measures → use functional status and sarcopenia as surrogate measures
Prospective Evaluation And Comparison Of The Predictive Ability Of Different Frailty Scores To Predict Outcomes In Geriatric Trauma Patients

Mohammad Hamidi, MD, Muhammad Zeeshan, MD, Terence O'Keeffe, MD, Narong Kulvatunyou, MD, Andrew Tang, MD, Lynn Gries, MD, El-Rasheid Zakaria, MD, Bellal Joseph, MD

- 2-year Prospective
- 341 geriatric trauma patients
- TSFI, mFI, Rockwood FI, Frail Scale
- Outcomes
  - Predictive ability of each model
Prospective Evaluation And Comparison Of The Predictive Ability Of Different Frailty Scores To Predict Outcomes In Geriatric Trauma Patients

Mohammad Hamidi, MD, Muhammad Zeeshan, MD, Terence O'Keeffe, MD, Narong Kulvatunyou, MD, Andrew Tang, MD, Lynn Gries, MD, El-Rasheid Zakaria, MD, Bellal Joseph, MD

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>TSFI</th>
<th>RFS</th>
<th>mFl</th>
<th>FS</th>
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</thead>
<tbody>
<tr>
<td>Complications</td>
<td>80%</td>
<td>81%</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td>Mortality</td>
<td>84%</td>
<td>85%</td>
<td>74%</td>
<td>70%</td>
</tr>
<tr>
<td>Rehab/SNF Disposition</td>
<td>84%</td>
<td>82%</td>
<td>65%</td>
<td>61%</td>
</tr>
<tr>
<td>30-d Readmission</td>
<td>75%</td>
<td>76%</td>
<td>61%</td>
<td>60%</td>
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</table>
THE IMPACT OF SARCOPENIA

NEARLY 25% OF 65+ YEAR OLDS ARE AFFECTED BY SARCOPENIA

60% OF 80+ YEAR OLDS ARE AFFECTED BY SARCOPENIA

60 YRS

80 YRS
Can Sarcopenia Quantified by CT Scan Predict Adverse Outcomes in Emergency General Surgery?

Mohammad Hamidi, MD, Cathy Ho, MD, Muhammad Zeeshan, MD, Terence O’Keeffe, MD, Ali Hamza, MD, Narong Kulvatunyou, MD, Faisal Jehan, MD, and Bellal Joseph, MD

Sarcopenia does not predict frailty

- 30d-outcomes
FRAILTY PUBLICATIONS
5631

FRAILTY & SURGERY
595
The Association of Frailty With Outcomes and Resource Use After EGS: A Population-Based Cohort Study

McIsaac, Daniel I. MD, MPH, FRCP; Moloo, Husein MD, FRSC; Bryson, Gregory L. MD, MSc, FRCP; van Walraven, Carl MD, FRCP, MSc

Frailty as a Risk Predictor of Morbidity and Mortality Following Liver Surgery

Faiz Gani, Marcelo Cerullo, Neda Amini, Stefan Buettner, Georgios A. Margonis, Kazunari Sasaki, Yuhree Kim

Frailty, Aging, and Cardiovascular Surgery

Graham, Antonio DO; Brown, Charles H. IV MD, MHS

Comparison of Frailty Measures as Predictors of Outcomes After Orthopedic Surgery
Superiority of Frailty Over Age in Predicting Outcomes Among Geriatric Trauma Patients: A Prospective Analysis

Bellal Joseph, MD, Viraj Pandit, MD, Bardiya Zangbar, MD, Narong Kulvatunyou, MD, Ammar Hashmi, MD, Donald J. Green, MD, Terence O’Keeffe, MB, ChB, Andrew Tang, MD, Gary Vercruysse, MD, Mindy J. Fair, MD, Randall S. Friese, MD, and Peter Rhee, MD

Frailty Predicts Increased Hospital And 6-month Healthcare Cost Following Colorectal Surgery In Older Adults

Thomas N. Robinson, M.D., F.A.C.S, Daniel S. Wu, M.D, Gregory V. Stiegmann, M.D., F.A.C.S., and Marc Moss, M.D.cMD, MSc

Frailty, Length of Stay, and Mortality in Kidney Transplant Recipients: A National Registry and Prospective Cohort Study

McAdams-DeMarco, Mara A. PhD; King, Elizabeth A. MD; Luo, Xun MD, MPH; Haugen, Christine et al

Assessing Risk of Critical Care Complications and Mortality in the Elective Bariatric Surgery Population Using a Modified Frailty Index
...and I should care, why?
Accumulated Frailty Characteristics Predict Postoperative Discharge Institutionalization in the Geriatric Patient

Thomas N. Robinson, MD. FACS, Jeffrey I. Wallace, MD, Daniel S. Wu, MD, Arek Wiktor, MD et al.

Prospective Evaluation of Delirium in Geriatric Patients Undergoing Emergency General Surgery

The Association of Frailty With Outcomes and Resource Use After EGS: A Population-Based Cohort Study

McIsaac, Daniel I. MD, MPH, FRCPC; Moloo, Husein MD, FRCSC, MSc; Bryson, Gregory L. Et al

McIsaac, Daniel I. MD, MPH, FRCPC; Moloo, Husein MD, FRCSC, MSc; Bryson, Gregory L. Et al
Superiority of Frailty Over Age in Predicting Outcomes Among Geriatric Trauma Patients: A Prospective Analysis

The Impact Of Frailty On Failure-to-rescue In Geriatric Trauma Patients: A Prospective Study

Preinjury Physical Frailty And Cognitive Impairment Among Geriatric Trauma Patients Determine Post Injury Functional Recovery And Survival
Predicting Hospital Discharge Disposition In Geriatric Trauma Patients: Is Frailty The Answer?

Joseph, Bellal MD; Pandit, Viraj MD; Rhee, Peter MD; Aziz, Hassan MD; Sadoun, Moutamn MD; Wynne, Julie MD et al

Redefining The Association Between Old Age And Poor Outcomes After Trauma: The Impact Of Frailty Syndrome.

Joseph, Bellal MD; Orouji Jokar, Tahereh MD; Hassan, Ahmed MD; Azim, Asad MD; Mohler, Martha Jane PHD, MPH et al
FRAILTY & COMPLICATIONS

Complications
Prospective, Single center study

260 EGS Patients

EGS Specific Frailty Index

Outcomes:

• Post-Op complications

• Mortality

Prospective, Single center study

250 Trauma Patients

Trauma Specific Frailty Index

Outcomes:

• In-hospital complications

• Adverse disposition
FRAIL STATUS:

- Higher rates of complications (x2)
- Prolonged hospital length of stay (x3)
- Higher odds of discharge to SNF/LTAC (x2)
- Higher mortality (22% vs 2%)

Age was not a predictor of outcomes when controlled for frailty.
The Impact of Frailty on Outcomes after Trauma in Critically Ill Geriatric Patients Admitted to Intensive Care Unit
Mohammad Hamidi, MD, Terence O’Keeffe, MD, Muhammad Zeeshan, MD, Narong Kulvatunyou, MD, Andrew Tang, MD, Gary Vercruysse, MD, Arpana Jain, MD, and Bellal Joseph, MD

- 5-year retrospective national database analysis
- 88629 geriatric trauma patients admitted to ICU (66% TBI patients).
- Frailty: CSHA-FI 11 variables

**Outcomes:**
- Complications
- Mortality
- Unfavorable discharge disposition (Rehab/SNF)
FRAILTY IN ICU PATIENTS

- Mortality
- Complications
- Rehab/SNIF discharge

Rates, %

FRAILTY INDEX, FI
FAILURE TO RESCUE (FTR)

COMPICATIONS!

FAILURE

RESCUED
Measure Quality
- Prospective, single center
- 326 EGS patients
- EGS Specific Frailty Index
- Outcomes:
  - Failure to rescue

ARTICLE INFO

Object: Prospective study of 326 emergency general surgery (EGS) patients. We aimed to assess the impact of frailty on clinical outcomes and identify potential predictors of failure to rescue (FTR).

Methods: We used the EGS-specific frailty index to stratify patients into high and low frailty groups. The primary outcome was FTR, defined as death within 30 days of admission. Logistic regression analysis was performed to identify independent predictors of FTR.

Results: Among the 326 EGS patients, 43 (13%) were classified as frail. Frail patients had a significantly higher risk of FTR compared to non-frail patients (OR = 3.2, 95% CI: 1.4-7.1). Independent predictors of FTR included age, comorbidity index, and frailty status.

Outcomes: Failure to rescue

TRAUMA INFORMATION

Object: Prospective study of 368 trauma patients. We aimed to assess the impact of trauma-specific frailty on clinical outcomes and identify potential predictors of failure to rescue.

Methods: We used the trauma-specific frailty index to stratify patients into high and low frailty groups. The primary outcome was FTR, defined as death within 30 days of admission. Logistic regression analysis was performed to identify independent predictors of FTR.

Results: Among the 368 trauma patients, 62 (17%) were classified as frail. Frail patients had a significantly higher risk of FTR compared to non-frail patients (OR = 2.5, 95% CI: 1.5-4.2). Independent predictors of FTR included age, trauma mechanism, and frailty status.

Outcomes: Failure to rescue
**FRAIL STATUS:**

- Higher rate of FTR
- EGS: 19% vs 4%
- Trauma: 15% vs 5%
- Independent predictor of FTR [OR~3]
Long term outcome

- Eating
- Bathing
- Dressing
- Transferring
- Toileting
- Walking or moving around

Quality of Life
- 3-y Prospective, single center study
- 267 trauma patients
- TSFI

<table>
<thead>
<tr>
<th></th>
<th>Non-Frail</th>
<th>Pre-Frail</th>
<th>Frail</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission FIM</td>
<td>11.98 ± 0.14</td>
<td>11.96 ± 0.18</td>
<td>11.81 ± 0.52</td>
<td>0.004</td>
</tr>
<tr>
<td>Discharge FIM</td>
<td>11.20 ± 0.80</td>
<td>11.14 ± 1.51</td>
<td>10.32 ± 2.14</td>
<td>0.002</td>
</tr>
<tr>
<td>Delta FIM</td>
<td>-0.78 ± 0.81</td>
<td>0.82 ± 1.51</td>
<td>-1.48 ± 2.1</td>
<td>0.013</td>
</tr>
</tbody>
</table>
### Prospective, single center study

- **350 trauma patients**
- **TSFI**

#### Outcomes:
- Trauma readmission
- 6 month mortality
- No. of falls
- Recurrent falls

<table>
<thead>
<tr>
<th>Variables</th>
<th>Non-Frail (n=99)</th>
<th>Pre-Frail (n=84)</th>
<th>Frail (n=97)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma readmission</td>
<td>4%</td>
<td>14%</td>
<td>40%</td>
<td>0.01</td>
</tr>
<tr>
<td>Recurrent Falls</td>
<td>5%</td>
<td>13%</td>
<td>65%</td>
<td>0.03</td>
</tr>
<tr>
<td>No. of falls</td>
<td>0[0-1]</td>
<td>0[0-3]</td>
<td>2[0-4]</td>
<td>0.01</td>
</tr>
<tr>
<td>Mortality</td>
<td>1%</td>
<td>3.5%</td>
<td>8.2%</td>
<td>0.04</td>
</tr>
</tbody>
</table>

- **Recurrent falls**
The Impact Of Frailty On Quality Of Life In The Geriatric Trauma Population: A Prospective Study
Chelsea Santino, MS, Muhammad Zeeshan, MD, Terence O’Keeffe, MD, Mohammad Hamidi, MD, Narong Kulvatunyou, MD, Andrew Tang, MD, Gary Vercruysse, MD, Arpana Jain, MD, and Bellal Joseph, MD

- 1 year prospective, single-center cohort study
- 296 trauma patients
- TSFI
- Short Form 36
- **Outcomes**: Quality of Life at discharge & Quality of Life at 30d after discharge
The Impact Of Frailty On Quality Of Life In The Geriatric Trauma Population: A Prospective Study

Chelsea Santino, MS, Muhammad Zeeshan, MD, Terence O’Keeffe, MD, Mohammad Hamidi, MD, Narong Kulvatunyou, MD, Andrew Tang, MD, Gary Vercruysse, MD, Arpana Jain, MD, and Bellal Joseph, MD

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frail (n=50)</th>
<th>Non-Frail (n=50)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRQoL at discharge, (mean ± SD)</td>
<td>366 ± 81</td>
<td>547 ± 54</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>30-d Post Discharge HRQoL, (mean ± SD)</td>
<td>393 ± 74</td>
<td>743 ± 32</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Delta HRQoL (mean ± SD)</td>
<td>21 ± 16</td>
<td>196 ± 38</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>P-value</td>
<td>0.11</td>
<td>&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>
MANAGE THE DAMAGE
GERIATRIC TRAUMA OPTIMIZATION
GERIATRIC SPECIFIC EDs

Geriatric Emergency Department Accreditation Program
GEDA was developed by leaders in emergency medicine to ensure that our older patients receive well-coordinated, quality care at the appropriate level at every ED encounter.

Level 3 accreditation signifies excellence in older adult care as represented by one or more geriatric-specific initiatives that are reasonably expected to elevate the level of elder care in one or more specific areas.

Level 2 accreditation identifies sites that have integrated and sustained older adult care initiatives into daily operations.

Level 1 accreditation defines an ED with policies, guidelines, procedures, and staff (both within the ED and throughout the institution) providing a coherent system of care targeting and measuring specific ED outcomes for older adults.
GERIATRIC SPECIFIC EDs

- Began appearing in the US in **2008** and have become increasingly common

- **Multi-disciplinary team** of care providers focused on the needs of the geriatric population

- **Staffing enhancements**: availability of
  - Specialized nurses
  - Specialized Pharmacists
  - Social workers
  - Geriatric consultation services in the ED
GERIATRIC SPECIFIC EDs

- Main goals →↓ hospital admissions

- Discharge protocols: facilitate communication with outpatient care providers

- Provides appropriate outpatient follow up (telephone/telemedicine)

- Geriatric Program Quality Improvement Plan
  - Geriatric volume
  - Admission and readmission rates
MANAGEMENT PLAN

PREVENTION

Triage
Assessment
In-hospital management
PREVENTION
Fall Prevention

- Gait, and balance check
- Medication modification
- Exercise program
- Home modification
- Avoid polypharmacy

60% ↓ in Falls

MVC Prevention

- Graduated exercise programs
- Driving simulations
- Video based training
Are Trauma Systems Designed for Geriatric Injuries?
Unconscious Age Bias:
Older adults, especially women, are less likely to receive care at trauma centers.
Older Adults are Under-Triaged
Lethal: 2-fold ↑ mortality
Increased Trauma Activation Is Not Equally Beneficial For All Elderly Trauma Patients

Carr, Bryan W., MD; Hammer, Peter M., MD; Timsina, Lava, PhD, MPH; Rozycki, Grace, MD, MBA; Feliciano, David V., MD; Coleman, Jamie J., MD

- ↑ Trauma activation was proposed to improve outcomes vs. increased cost and stress to the hospital system

- What is the age at which an increase in activation status is beneficial?

- Policy change ↑ the activation criteria to the highest level for patients >70y
Increased Trauma Activation Is Not Equally Beneficial For All Elderly Trauma Patients

Carr, Bryan W., MD; Hammer, Peter M., MD; Timsina, Lava, PhD, MPH; Rozycki, Grace, MD, MBA; Feliciano, David V., MD; Coleman, Jamie J., MD

- Patients who presented prior to policy changes (PRE) were compared with those after the change (POST)
- Mortality and LOS were ↓ in patients in the POST group who are >77y

- There is benefit with ↓ cost
• Lower Threshold for Trauma Team Activation in Elderly patients
• Own activation Team

• Advanced AGE is not an absolute predictor of poor outcomes should not be used

• Aggressive Care

• Shock Index Will help in Triage Protocol
Geriatric Trauma:

- **Primary survey:** *No difference*
- Secondary survey
  - Determine medications that affect initial evaluation
    - Anticoagulants
    - Antiplatelet
    - Beta blocker
    - ACE Inhibitors
  - Identify disease that complicate patient’s presentation
    - MI
    - Pneumonia
    - CVA
    - Hypovolemia
RESUCITATION

- Adopt moderate resuscitation approaches
- High volume resuscitation (≥1.5 L) → high risk for mortality
- When required consider
  - ICU admission
  - Operative intervention
• 311 patients receiving massive transfusion post trauma

• Aim: investigate mortality of elderly patients and explore variables associated with poor outcomes

• Stratification >65 y and <65 y
Massive Blood Transfusions Post Trauma In The Elderly Compared To Younger Patients
Biswadev Mitra, Alexander Olaussen, Peter A.Cameron, Tom O'Donohoe, Mark Fitzgerald

Predictors of mortality
- Acute traumatic coagulopathy (OR 11.75 p=0.02)
- Age (OR 1.18 p=0.06)
Improving Survival After an Emergency Resuscitative Thoracotomy: A 5-year Review of the Trauma Quality Improvement Program

Bellal J, Khan M, Jehan F, Latifi R, Rhee P

- A 5-year (2010-2014) retrospective analysis of ACS-TQIP
- 2,229 patients underwent ERT
- Overall survival rate was 9.6%
- Outcomes: ERT utilization rate & survival trends

No patient ≥ 60 y with a blunt MOI survived
No patient ≥ 70 y regardless of MOI survived
Mortality After Trauma Laparotomy In Geriatric Patients
Bellal Joseph, Bardiya Zangbar, Viraj Pandit, Narong Kulvatunyou, Lynn Gries, Randall S. Friese, Peter Rhee

- 6-year retrospective analysis, all trauma patients undergoing a laparotomy
- Age ≥55 y who underwent a trauma laparotomy

Outcomes: Mortality & Predictors of mortality
Predictors of Mortality

- Age
- Admission lactate

**Fig** – Mortality stratified by age.
Specialized Inpatient Care

- Pain management
- Consult geriatrician
- CGA
- Frailty
PAIN MANAGEMENT

• Assessment of pain severity

• Multimodal approach to pain
  • Regional anesthesia
  • PCA
  • Nerve blocks

• Careful utilization of opioids
  • Bowel stimulating laxatives

• NSAIDs
  • PUD
  • Anticoagulation
Decreased Risk of Delirium With Use of Regional Analgesia in Geriatric Trauma Patients With Multiple Rib Fractures

O'Connell, Kathleen M., MD, MPH; Quistberg, D. Alex, PhD, MPH; Tessler, Robert, MD; Robinson, Bryce R. H., MD, MS; Cuschieri, Joseph, MD; Maier, Ronald V., MD; Rivara, Frederick P., MD, MPH; Vavilala, Monica S., MD; Bhalla, Paul I., MD; Arbabi, Saman, MD, MPH

2018

- Retrospective study
- 144 patients ≥65y with ≥ 3 rib fractures, and admission to ICU
- Outcome: delirium positive ICU days

Risk of delirium ↓ by 24% per day per patient after regional anesthesia

Individual opioid use ↓ after regional anesthesia
An Evaluation of a Proactive Geriatric Trauma Consultation Service

Lenartowicz, Magda MD*; Parkovnick, Meredith MSc†; McFarlan, Amanda BA†; Haas, Barbara MD‡; Straus, Sharon E. MD, MSc§; Nathens, Avery B. MD, PhD, MPH‖; Wong, Camilla L. MD

- 2 year prospective analysis
- 486 geriatric trauma patient
- **Intervention:** geriatric trauma consultation
- **Outcome measures** Complications & Mortality
Geriatric trauma consultation:

- Clinical nurse specialist
- Geriatrician
- Communication of recommendations
- Weekly interdisciplinary meetings with the trauma team
- Measurement of quality indicators.

↓ 10% delirium

↓ 5% SNF discharge

Issue addressed:

- Sensory impairment
- Pain
Comprehensive Geriatric Assessment:

- 10% ↓ in delirium
- 36% ↓ in falls
- 4 days ↓ in hospital stay
- 13% ↑ in ADL
## Fifteen Variable Trauma Specific Frailty Index

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>YES (1)</th>
<th>No (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer history</td>
<td>MI (1)</td>
<td>CABG (0.75)</td>
</tr>
<tr>
<td>MI (0.5)</td>
<td></td>
<td>PCI (0.5)</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>Medication (0.25)</td>
<td>None (0)</td>
</tr>
<tr>
<td>Dementia</td>
<td>Severe (1)</td>
<td>Moderate (0.5)</td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td>Mild (0.25)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Daily Activities</th>
<th>Yes (1)</th>
<th>No (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help with grooming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help managing money</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help doing housework</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help toileting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help walking</td>
<td>Wheelchair (1)</td>
<td>Walker (0.75)</td>
</tr>
<tr>
<td></td>
<td>No (0)</td>
<td>Cane (0.5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Health Attitude</th>
<th>Most time (1)</th>
<th>Sometimes (0.5)</th>
<th>Never (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feel less useful</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel sad</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel effort to do everything</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falls</td>
<td>Most time (1)</td>
<td>Sometimes (0.5)</td>
<td>Never (0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Present not in last month (0.5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feel lonely</td>
<td>Most time (1)</td>
<td>Sometimes (0.5)</td>
<td>Never (0)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Function</th>
<th>Yes (0)</th>
<th>No (1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>&lt;3 (1)</th>
<th>&gt;3 (0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
If limited resources

• Use: **Trauma Specific Frailty Index**

**ISAR screening questions**

1. Before the illness or injury that brought you to the Emergency Department, did you need someone to help you on a regular basis?  
   - Yes/No

2. Since the illness or injury that brought you to the Emergency Department, have you needed more help than usual to take care of yourself? 
   - Yes/No

3. Have you been hospitalized for one or more nights during the past six months (excluding a stay in the Emergency Department)?  
   - Yes/No

4. In general, do you see well?  
   - Yes/No

5. In general, do you have serious problems with your memory?  
   - Yes/No

6. Do you take more than three different medications every day?  
   - Yes/No

**Score of 2 or more**

**Obtain Geriatric Consultation**
Plan early mobilization

Establish PMHx:
- Communicate with family and PCP
- Document complete medication list
- Avoid polypharmacy

Effective pain management:
- Improve pulmonary functions
- Optimize mobility
- Mitigate delirium

Delirium

Pain relief

INPATIENT CARE
Delirium in the ICU: What About the Floor?
Cahill, Anthony MD; Pearcy, Christopher MD; Agrawal, Vaidehi PhD; Sladek, Phillip MD; Truitt, Michael S. MD

Don’t Call Me Crazy! Delirium Occurs Outside of the Intensive Care Unit
Cahill, Anthony MD; Pearcy, Christopher MD; Almahmoud, Khalid MD; Agrawal, Vaidehi PhD; Mani, Usha MD; Sladek, Phillip MD; Truitt, Michael S. MD
• 14-56% of all hospitalized elderly patients
• 70-87% of all elderly in ICU
  • Mortality: 22-76%
• Increases cost by $2,500/patient
• Annual expenditures: $7 billion.
<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Consultation (n=62)</th>
<th>Standard (n=65)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delirium</td>
<td>32%</td>
<td>50%</td>
<td>0.04</td>
</tr>
<tr>
<td>Severe delirium</td>
<td>12%</td>
<td>29%</td>
<td>0.02</td>
</tr>
<tr>
<td>Hospital stay,</td>
<td>5 ± 2</td>
<td>5 ± 2</td>
<td>0.72</td>
</tr>
<tr>
<td>Rehab/SNF Disposition</td>
<td>92%</td>
<td>88%</td>
<td>0.41</td>
</tr>
<tr>
<td>Delirium at discharge</td>
<td>13%</td>
<td>19%</td>
<td>0.35</td>
</tr>
</tbody>
</table>
MANAGING EGS
Pre-operative care

In-hospital management

Discharge planning
RECOMMENDATIONS

• Use realistic risk prediction tools
Geriatric Patient

High Risk

Can not Delay Treatment

Can Delay Treatment

Low Risk

Surgery
<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Non-surgical options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diveritiular/appendix abcess</td>
<td>Radiological drainage</td>
</tr>
<tr>
<td>Nongangrenous mesenteric ischemia</td>
<td>Anticoagulation</td>
</tr>
<tr>
<td></td>
<td>Interventional radiology</td>
</tr>
<tr>
<td>Severe cholecystitis</td>
<td>Radiological drainage, “cholecystostomy”</td>
</tr>
<tr>
<td>Bleeding duodenal ulcer</td>
<td>Endoscopic hemostasis</td>
</tr>
<tr>
<td></td>
<td>Selective IR emolization</td>
</tr>
<tr>
<td>Obstructing colorectal cancer</td>
<td>Endoluminal stenting</td>
</tr>
<tr>
<td>Sigmoid volulus</td>
<td>Rigid or flexible endoscopic decompression</td>
</tr>
</tbody>
</table>
Geriatric Patient

- High Risk
  - Can not Delay Treatment
- Low Risk
  - Surgery
Prehabilitation

• Enhancing functional capacity
• Withstand the stressor of surgery

Intention

The fitter they are, the quicker they will recover.
Assessing Decision Making Capacity

Determine whether or not the patient has decision-making capacity

- Able to **communicate** a choice
- **Understand** the relevant information
- Appreciate the situation and its consequences
- Reason about treatment options
Patient Goals, Preferences, and Advance Directives

Personal goals and treatment preferences should be addressed prior to surgery.

Discuss:
- Postoperative functional decline
- Loss of independence
- Skilled care burden
- Advance directive and a designated health care proxy
Medication Management

- Review all medications including OTC and herbal products
- Discontinue medications with risk of adverse reaction
- Adequately control pain
- Appropriate reversal of anticoagulation
Pre-operative care
In-hospital management
Discharge planning
Anesthetic Approach
- Elderly Considerations
- Techniques

Perioperative Analgesic Plan
- Opioid-Sparing Techniques
- Regional Techniques

Perioperative Nausea & Vomiting
- Risk stratification

Patient Safety
- Pressure Ulcers / Nerve Damage
- VTE Prophylaxis

Fluid management
- IV Fluids considerations

Hypothermia and Pulmonary Complications
- Prevention Strategies
• A directed pain history and physical examination

• Multimodal approach
  • Scheduled acetaminophen > regional blocks > epidural
  • Appropriately titrate to patient needs
  • Give prophylactic pharmacological bowel regimen
    - Stool softeners + Stimulant Laxatives

• Follow Beers Criteria (Benzos, barbiturates, non-cox NSAIDs...)
Multidisciplinary approach
### Postoperative Rounding Checklist

<table>
<thead>
<tr>
<th>Daily Evaluation For</th>
<th>Prevention/Management Strategies</th>
</tr>
</thead>
</table>
| Delirium/cognitive impairment | Pain control  
| | Optimize physical environment (for example, sleep hygiene, sleep protocol, minimize tethers, encourage family at bedside)  
| | Vision and hearing aids accessible  
| | Ability to maintain adequate nutrition  
| | Resume diet as early as feasible  
| | Dentures made available  
| | Supplementation if indicated  
| | UTI prevention  
| | Daily documentation of Foley catheter indication  
| | Catheter care bundles, hand hygiene, barrier precautions  
| | Functional decline  
| | Care models and pathways  
| | Structural: uncluttered hallways, large clocks and calendars  
| | Multidisciplinary rounds  
| | Early mobilization and/or PT/OT  
| | Family participation  
| | Nutritional support  
| | Minimize patient tethers  
| | Pressure ulcers  
| | Reduce/minimize pressure, friction, humidity, shear force  
| | Maintain adequate nutrition  
| | Wound care  

*Perioperative acute pain*
Frailty screening and a Frailty Pathway Decrease Length of stay, Loss of Independence, and 30-day Readmission rates in Frail Geriatric Trauma and Emergency General Surgery Patients

Kathryn E. Engelhardt, MD, Quentin Reuter, MD, Jessica Liu, MD, Jonathan F. Bean, MD, Joliette Barnum, MD, Michael B. Shapiro, MD, Allison Ambre, DPT, Amanda Dunbar, Mara Markzon, Tara N. Reddy, MD, Christine Schilling, MFS, and Joseph A. Posluszny, Jr.

• Prospective (before-after) study

• 70 frail patients (11 before vs 59 after intervention)

• **Intervention:** novel frailty pathway

• **Outcomes:** LOS & 30-day readmission rate
Patient admitted to Trauma or Emergency General Surgery Service

Primary Assessment

Not Frail

Patient >65

Usual Care

Frailty Index Measured

Frail

Frailty Intervention

Use of specialized order set

Hospitalist consult

Early family engagement on LOS and discharge disposition

Palliative care consult when appropriate

Expediting SW and PT/OT evaluation

Frailty Follow-up

3 day phone call after discharge

7 day follow-up appointment after discharge

Outcome Metrics

1. Hospital Length of stay
2. 30 day Readmissions
<table>
<thead>
<tr>
<th>Measure/Outcome</th>
<th>Before Intervention n = 11 (%)</th>
<th>After Intervention n = 59 (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalist consult</td>
<td>27%</td>
<td>98%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Documented discussion of expectations</td>
<td>18%</td>
<td>96%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Length of stay, median [IQR]</td>
<td>9 [3-14]</td>
<td>6 [3-12]</td>
<td>0.40</td>
</tr>
<tr>
<td>30-day readmission</td>
<td>4 (36.4)</td>
<td>6 (10.2)</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Preop:
- Patient education (1C)
- Carb loading (2B) / Clear liquids until 2hrs prior (1A)
- Mechanical & oral bowel prep (2B)
- Optimize comorbidity (2B)

Intraop:
- Preset orders (2C)
- SSI bundle: abx / prep (1B)
- Pre-emptive, multimodal pain control (1B)
- Restrictive / goal directed fluid use (1B)
- Laparoscopic approach (1A)

Postop:
- Early feeding, heplock (1B)
- Multimodal pain regimen (1B)
- Early foley removal / ambulation (1B)
- No drains (1B)
High Compliance to an Enhanced Recovery Pathway for Patients ≥65 Years Undergoing Major Small and Large Intestinal Surgery Is Associated With Improved Postoperative Outcomes

Oluwafemi P. Owodunni, MD, MPH, Jessica Hampton, MS, Dianne Bettick, MSN, CNS, RN, Sara Sateri, MD, Thomas Magnuson

- 4 years analysis 2013-2017, 281 Geriatric patients undergoing major intestinal injuries
- Analysis: Pre ERP vs Post-ERP
- Outcomes: LOS, Complications, Readmissions

### TABLE 1. ERP in Perioperative Care

<table>
<thead>
<tr>
<th>Perioperative Variables</th>
<th>Definition of Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preoperative</td>
<td></td>
</tr>
<tr>
<td>1. Preadmission counselling</td>
<td>Shared educational book and online</td>
</tr>
<tr>
<td>2. Prevention of Insulin Resistance</td>
<td>EMMI module on enhanced recovery after gastrointestinal surgery</td>
</tr>
<tr>
<td>3. Prevention of postoperative nausea/vomiting</td>
<td>Clear liquid carbohydrate drink (Gatorade) consumption between midnight and 3h prior to induction of anesthesia</td>
</tr>
<tr>
<td>4. Use of regional anesthetic</td>
<td>Documented screening for risk factors for postoperative nausea or vomiting. Risk factors include: female, nonsmoking, history of motion sickness, history of postoperative nausea and vomiting, and preoperative, intraoperative opioid. Preoperative placement of a scopolamine patch + ≥ 1 intraoperative IV antiemetic. The use of a thoracic epidural placed preoperatively of for all open cases with continuous epidural infusion of bupivacaine unless contraindicated. Alternatively, a TAP block can be performed preoperatively for laparoscopic cases unless contraindicated. If regional anesthetic is contraindicated, intraoperative intravenous lidocaine infusion may be used. Intraoperative temperature ≥ 36.9°C and on admission to the PACU. Goal-directed fluid therapy monitored by Edwards ClearSight hemodynamic monitoring and/or case volume = 3 mL/kg per hour of intraoperative crystalloid and colloid fluid.</td>
</tr>
<tr>
<td>5. Intraoperative temperature control</td>
<td>Preoperative administration of Gabapentin, Acetaminophen and Celebrex. Use of Lidocaine dermal patches 24h after TAP block in laparoscopic procedures. Use of intravenous and oral NSAIDS postoperatively. Use of intravenous Acetaminophen postoperatively. If epidural in place, continuous epidural infusion of Bupivacaine + low dose Fentanyl. Recording of POD pain controlled with oral pain medication: First date on which pain is adequately controlled with oral pain medications alone for 24h. The patient should be able to ambulate (unless unable preoperatively) without significant pain (significant pain is a score &gt; 4 on a scale from 0 to 10). Ambulation occurred any length of time within the POD 0 given time Ambulation occurred twice during this time period. Standing at bedside not included. Ambulation occurred twice during this time period. Standing at bedside not included. Clear liquid diet ordered POD #0. Return of bowel function recorded in EMR as date bowel movement or flatus passed. Solid diet was ordered POD #1. Date tolerating diet recorded as first date patient could tolerate 1 solid meal and drink 800 cc or more of a liquid diet without need for IV fluids and no signs of nausea/vomiting, or abdominal pain. Solid meal indicates not puree food. Maintenance IVF discontinued (anything 42 cc or more) POD #0, fluid bolts allowed Foley catheter removed POD #1 unless indicated patient was high risk (history of BPH, prostate surgery, bladder injury, extensive pelvic surgery or history of postoperative urinary retention).</td>
</tr>
<tr>
<td>6. Intraoperative fluid management</td>
<td></td>
</tr>
<tr>
<td>7. Multimodal analgesia</td>
<td></td>
</tr>
<tr>
<td>Postoperative</td>
<td></td>
</tr>
<tr>
<td>8. Mobilization POD #0</td>
<td></td>
</tr>
<tr>
<td>9. Mobilization POD #1</td>
<td></td>
</tr>
<tr>
<td>10. Mobilization POD #2</td>
<td></td>
</tr>
<tr>
<td>11. Diet started on POD #0</td>
<td></td>
</tr>
<tr>
<td>12. Diet advanced POD #1</td>
<td></td>
</tr>
<tr>
<td>13. Discontinuation of IVF</td>
<td></td>
</tr>
<tr>
<td>14. Discontinuation of Foley Catheter</td>
<td></td>
</tr>
</tbody>
</table>
High Compliance to an Enhanced Recovery Pathway for Patients 65 Years Undergoing Major Small and Large Intestinal Surgery Is Associated With Improved Postoperative Outcomes

Oluwafemi P. Owodunni, MD, MPH, Jessica Hampton, MS, y Dianne Bettick, MSN, CNS, RN, z Sara Sateri, MD, Thomas Magnuson, MD, Elizabeth ERP:

• Shorter h-LOS (OR: 0.7[0.6-0.9]) 30% decrease
• Lower complications (OR: 0.4[0.1-1.0]) 60% decrease
• No effect on readmissions
Pre-operative care

In-hospital management

Discharge planning
CARE TRANSITIONS MODELS

BU

Boston University School of Medicine

Penn

TRANSITIONAL CARE MODEL

Hospital

Skilled Nursing Facility

Rehabilitation Center

Home
Transition of Care

Coordinated care, particularly with primary care physician

Engagement of patient, family, and/or caregiver

Post-discharge follow up plan

Consistent communication

- Evaluate need for and obtain language assistance
- Make follow-up appointments
- Plan for follow-up of medicines or refills, if necessary
- Organize postdischarge outpatient services and medical equipment
- Identify the correct medicines and a plan for a patient to obtain them
- Teach a written discharge plan the patient can understand
- Educate the patient about his or her diagnosis and medicines
- Assess the degree of the patient’s understanding of the discharge plan
- Expedite the transmission of the discharge summary to clinicians accepting care of the patient
- Provide telephone reinforcement of the discharge plan
PALLIATIVE CARE

Promotes quality of life
Treats the whole person
Supports the family
Is an “extra layer of support” for all

HOSPICE & PALLIATIVE CARE
High Burden of Palliative Care Needs of Older Adults During Emergency Major Abdominal Surgery

Zara Cooper, MD, MSc, Elizabeth J. Lilley, MD, MPH, Evan Bollens-Lund, MA, Susan L. Mitchell, MD, Christine S. Ritchie, MD, MSPH, Stuart R. Lipstiz, ScD, Amy S. Kelley, MD,

• Retrospective study

• 411 elderly patients undergoing emergency major abdominal surgery

• **Aim:** Quantify preoperative illness burden, examine its association with outcomes, and describe end-of-life care
High Burden of Palliative Care Needs of Older Adults During Emergency Major Abdominal Surgery

Zara Cooper, MD, MSc, Elizabeth J. Lilley, MD, MPH, Evan Bollens-Lund, MA, Susan L. Mitchell, MD, Christine S. Ritchie, MD, MSPH, Stuart R. Lipstiz, ScD, Amy S. Kelley, MD

2/3rd of these individuals were potential candidates for palliative care
Validation of a Geriatric Trauma Prognosis Calculator: A P.A.L.L.i.A.T.E. Consortium Study

Allyson C. Cook, MD, Bellal Joseph, MD, M. Jane Mohler, MSN, MS, PhD, Kenji Inaba, MD, Brandon R. Bruns, MD, Paul A. Nakonezny, PhD, Jeff D. Kerby, MD, PhD, Karen J. Brasel, MD, MPH, Steven E. Wolf, MD et al.

- Retrospective cohort study (2000-2013)
- Aim: Validate a prognosis calculator → geriatric trauma outcome score ii (GTOS II)
  - Estimate probability of unfavorable discharge
- 16,114 trauma patients >65y surviving to discharge
- Outcomes: gastrostomy, tracheostomy placement, and enrollment in hospice

Primary Sample
(n = 16,114)

Score Creation Sample
(n = 8,057)

Score Validation Sample
(n = 942)
Surgical Palliative Care Consultations Over Time in Relationship to Systemwide Frailty Screening
Katherine F. Ernst, BS; Daniel E. Hall, MD, MDiv, MHSc; Kendra K. Schmid, PhD; Georgia Seever, RN; Pierre Lavedan, MD; Thomas G. Lynch, MD, MHA; Jason Michael Johanning, MD, MS

- 310 surgery patients who underwent palliative care consultations (160 before frailty screening, 150 after)

- **Intervention**: Surgical palliative care consultations, including frailty screening

- **Primary Outcomes**: 30-, 180-, and 360-day mortality
Surgical Palliative Care Consultations Over Time in Relationship to Systemwide Frailty Screening

Take Home Message:

1. You Must Calculate Frailty
2. Use Objective Data for Conversations

- Increased rate of palliative care consultations (30%)
FUTURE Directions

• Geriatric specific centers?

• Surgeon volume is predictor, NOT the hospital volume

• Surgeons performing ≤8 procedures annually:
  • 86% higher odds of death
  • 74% higher odds of FTR

• Dedicated geriatric surgical training?
Thank You!

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