Single end-organ function assessment does not capture all the information required to predict adverse outcomes for the geriatric patient.
DEFINITION OF FRAILTY

• Frailty is an excess vulnerability to stressors, with reduced ability to maintain or regain homeostasis after a destabilizing event

• A non-specific state of increasing risk… measured by the accumulation of frailty traits

FRAILTY CHARACTERISTICS

- Geriatric Syndromes
- Depressed Mood
- Impaired Cognition
- Burden of Chronic Disease
- Low Albumin
- Functional Impairment
ACCUMULATION OF FRAILTY CHARACTERISTICS

FRAILTY

AVERAGE OUTCOMES

POOR OUTCOMES
ACCUMULATION OF FRAILTY CHARACTERISTICS

- Normal Mood
- Functional Impairment

AVERAGE OUTCOMES

POOR OUTCOMES
ACCUMULATION OF FRAILTY CHARACTERISTICS

- No Geriatric Syndromes
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AVERAGE OUTCOMES

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ACCUMULATION OF FRAILTY CHARACTERISTICS

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FRAILTY

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ACCUMULATION OF FRAILTY CHARACTERISTICS

- Low Albumin
- High Burden of Chronic Disease
- Impaired Cognition
- Functional Impairment

- No Geriatric Syndromes
- Normal Mood

AVERAGE OUTCOMES

POOR OUTCOMES
FRAILTY AND POSTOPERATIVE COMPLICATIONS
Patients age ≥ 70 years undergoing inpatient operations (n = 125) underwent baseline frailty assessment.

Increased frailty score was associated with:

- Increased post-op complications ($P = .02$)
- Longer hospital stay ($P < .01$)

Patients age ≥ 65 years undergoing inpatient operations (n = 110) underwent baseline frailty assessment.

Four or more frailty markers predicted 6-month mortality:

- Sensitivity 81%
- Specificity 86%

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# FRAILTY CHARACTERISTIC: FUNCTION

## NSQIP IMPORTANCE OF RISK ADJUSTMENT VARIABLES

<table>
<thead>
<tr>
<th>Mortality Models</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>Cholecystectomy</td>
<td>Functional Status</td>
<td>ASA Class</td>
<td>Ascites</td>
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<tr>
<td>Ventral Hernia</td>
<td>Functional Status</td>
<td>Dialysis</td>
<td>ASA Class</td>
</tr>
<tr>
<td>Gastric Bypass</td>
<td>Functional Status</td>
<td>CHF</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Pancreatectomy</td>
<td>Functional Status</td>
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</tr>
<tr>
<td>Colectomy</td>
<td>ASA Class</td>
<td>Functional Status</td>
<td>Emergency</td>
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## NSQIP IMPORTANCE OF RISK ADJUSTMENT VARIABLES

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FRAILTY

Depressed Mood

Functional Impairment

Geriatric Syndromes

Impaired Cognition

Burden of Chronic Disease

Low Albumin

FRAILTY CHARACTERISTICS

Slide 17
FRAILTY CHARACTERISTIC: HYPOALBUMINEMIA

- Lower albumin is related to increased thirty-day morbidity and mortality across multiple surgical specialties in a dose response fashion.

- Low serum albumin level was found to be most closely related to 30-day post-operative mortality from more than 30 pre-operative variables.

FRAILTY CHARACTERISTICS

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FRAILTY CHARACTERISTIC: GERIATRIC SYNDROMES

• ASA score of III or IV is closely related to 1-year mortality following hip fracture ($P < .001$)

• Pre-existing burden of chronic disease predicts 1-year mortality following hip fracture


FRAILTY CHARACTERISTICS

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Slide 21
## FRAILTY CHARACTERISTIC: COGNITION

<table>
<thead>
<tr>
<th>PRE-EXISTING COGNITIVE IMPAIRMENT</th>
<th>Present (n = 52)</th>
<th>Absent (n = 114)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital stay, days</td>
<td>13.4 ± 9.6</td>
<td>9.9 ± 8.4</td>
<td>&lt; .029</td>
</tr>
<tr>
<td>ICU stay, days</td>
<td>8.3 ± 8.0</td>
<td>5.8 ± 4.6</td>
<td>&lt; .043</td>
</tr>
<tr>
<td>D/C institutionalization</td>
<td>35%</td>
<td>10%</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>6-month mortality</td>
<td>19.1%</td>
<td>5.4%</td>
<td>.016</td>
</tr>
</tbody>
</table>

*Dan Wu, Tom Robinson. American College of Surgeon’s Surgical Forum (2010).*
FRAILTY CHARACTERISTICS

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# Frailty Characteristic: Mood

## Cardiac Valve Surgery

<table>
<thead>
<tr>
<th></th>
<th>Depression</th>
<th>No Depression</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-month mortality</td>
<td>13.2%</td>
<td>7.6%</td>
<td>.03</td>
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</tbody>
</table>

FRAILTY CHARACTERISTICS

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### FRAILTY CHARACTERISTIC: GERIATRIC SYNDROMES

<table>
<thead>
<tr>
<th></th>
<th>Number of falls in prior 6 months</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6-month mortality</td>
<td>1.6 ± 1.6</td>
<td></td>
</tr>
<tr>
<td>Alive at 6 Months</td>
<td>0.7 ± 1.4</td>
<td><em>P</em> &lt; .01</td>
</tr>
<tr>
<td>D/C to an institution</td>
<td>1.5 ± 1.7</td>
<td></td>
</tr>
<tr>
<td>D/C to home</td>
<td>0.5 ± 1.2</td>
<td><em>P</em> &lt; .01</td>
</tr>
</tbody>
</table>

ACCUMULATION OF FRAILTY CHARACTERISTICS

- No Geriatric Syndromes
- Normal Mood
- Low Albumin
- High Burden of Chronic Disease
- Impaired Cognition
- Functional Impairment

AVERAGE OUTCOMES

POOR OUTCOMES
THANK YOU FOR YOUR TIME!

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linkedin.com/company/american-geriatrics-society