Caring for the Hospitalized Older Adult

Edgar Pierluissi, MD
Geriatrics/Hospital Medicine
San Francisco General Hospital
epierluissi@medsfgn.ucsf.edu
Objectives

- Understand
  - incidence and outcomes of hospitalization-associated disability
  - risk factors for hospitalization-associated disability: both patient-level and hospital-level
  - interventions that have been tried to reduce hospitalization-associated disability

- Describe elements of one intervention that has shown promise in improving outcomes for older adults
Outline

- Hospitalization-associated disability
  - Incidence
  - Outcomes
  - Risk factors - patient and hospital level
  - Recovery
- Interventions
- Summary
Summary

- Hospitalization-associated disability is common among older adults.
- It confers significant burdens including further disability, nursing home placement, and death.
- Patients at risk can be identified.
- Multi-component interventions focusing on function can prevent hospitalization-associated disability.
Hospitalization-associated disability includes:

- new-onset disability
- development of worsening disability, and
- failure to recover from disability that occurs before admission.

JAMA. 2011;306(16):1782-1793
How is it measured?

- Disability is defined using the Katz Index of Activities of Daily Living (bathing, dressing, transferring, toileting, and eating, some include walking)

- Disability defined as requiring the assistance of another person to accomplish the activity

JAMA. 1963;185:914-919
Hazards

Hospitalization is a sentinel event in the life of an older adult.
Demographics

- Older adults

  13% population
  36% of hospital admissions
  44% of hospital charges

  14 million discharges
Hospitalization-associated disability

- Over past 30 years, multiple studies, consistent finding:

About 1/3 of older adults decline in ADL function from baseline to discharge
Community

- Precipitating Events Project
- 754 persons over 70 years old
- Independent in ADLs
- Followed for 5 years
- Monthly phone calls

- Half of all new onset disability attributable to hospitalization

*JAMA. 2004 Nov 3;292(17):2115-2124*
Trajectory of Life-Space Mobility: Surgical Compared to Non-surgical Admissions

Thirty years of research:

1) Hospitalization-associated disability occurs frequently among older adults and the incidence has not changed significantly.

2) Disability following hospitalization reflects both the failure to recovery from disability that happened before the admission, as well as new disability occurring after admission.

3) Hospitalization-associated disability accounts for half of all new-onset disability and significant life-space mobility restrictions among older adults.

4) Recurrent hospitalizations increase the risk for incident disability.
Outcomes of hospitalization-associated disability

- Long term and sustained disability
- Nursing home placement
- Death
- Costs
Disability and Death

J Amer Geriatr Soc. 2008;56(12):2171-2179
Costs

- Mean Medicare Part A expenditures are 10X higher for older adults who start out independent in mobility and ADLs and develop a mobility limitation and an ADL dependency in one year.
Outcomes

- Hospitalization-associated disability is a powerful risk factor for long-term disability, death, nursing home placement and increased costs of care.
Patient-level risk factors

- Three large studies over past 20 years point to predictive patient-level risk factors for hospitalization-associated disability:
  - Baseline (2 weeks prior to admission) function
  - Cognition on admission

J Gen Intern Med 1993;8:645-52
J Am Geriatr Soc. 2011;59(7):1206-16
### Patient-level risk factors

**HARP Prognostic Index**

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>75-84</td>
<td>1</td>
</tr>
<tr>
<td>≥85</td>
<td>2</td>
</tr>
<tr>
<td>Poor cognitive function</td>
<td>1</td>
</tr>
<tr>
<td>Needed assistance in ≥ IADLs 2 weeks prior to admission</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

- **0-1 point 19%**
- **2-3 points 31%**
- **4-5 points 55%**

Hospital admission risk profile
### Patient-level risk factors

#### Mehta Index for New-Onset Disability at Hospital Discharge

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Point Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>80-89</td>
<td>1</td>
</tr>
<tr>
<td>≥90</td>
<td>2</td>
</tr>
<tr>
<td><strong>Dependent in ≥3 IADLs 2 weeks prior to admission</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Mobility 2 weeks before admission</strong></td>
<td></td>
</tr>
<tr>
<td>Able to walk uphill or stairs but unable to run</td>
<td>1</td>
</tr>
<tr>
<td>Unable to walk uphill or stairs</td>
<td>2</td>
</tr>
<tr>
<td><strong>Number of ADL dependencies on admission</strong></td>
<td></td>
</tr>
<tr>
<td>2-3</td>
<td>1</td>
</tr>
<tr>
<td>4-5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Metastatic cancer</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Severe cognitive impairment</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>Albumin &lt;3.0 g/dl</strong></td>
<td>2</td>
</tr>
</tbody>
</table>
Hospital-level risk factors

- Low Mobility
- Delirium
Hospital-level risk factors

- Low mobility
  - Assessed by nurses rating or wireless accelerometers
    - Low mobility (16% 19%)
    - Intermediate (32% 16%)
    - High (52% 65%)

Low Mobility

- Declined in ADL at discharge: 87.0% (n=87)
- Declined in ADL at 1-month follow-up: 71.8% (n=56)
- Declined in IADL at 1-month follow-up: 66.7% (n=46)

Legend:
- Gray bars: n=525, p<0.001
- Black bars: n=431, p<0.001
- Black bars: n=426, p=0.06
**Low Mobility**

<table>
<thead>
<tr>
<th>In-Hospital Mobility Level (Reference: High Mobility*)</th>
<th>Decline in ADL Function from Premorbid to Discharge (N = 525)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude</td>
<td>Adjusted$^a$</td>
<td></td>
</tr>
<tr>
<td>Moderate$^a$</td>
<td>4.52 (2.74–7.47)</td>
<td>4.09 (2.27–7.37)</td>
<td></td>
</tr>
<tr>
<td>Low$^i$</td>
<td>16.22 (8.65–30.40)</td>
<td>18.03 (7.68–42.28)</td>
<td></td>
</tr>
</tbody>
</table>

$^a$ Adjusted for age, sex, cognitive status, physical activity level at baseline, basic and instrumental functional status at baseline, Charlson comorbidity score, acute physiology score, length of hospital stay, transfer to intensive care unit, and whether interviews were conducted with a surrogate.
Low Mobility - ? Mechanism

- Healthy volunteers, mean age 67
- Bedrest for 10 days
- Measure knee extension strength before and after

- What fraction of strength did volunteers lose in 10 days of bedrest?
Low Mobility

- Associated with:
  - Disability
  - Delirium
  - Depression
  - Falls
  - Incontinence
  - Constipation
  - Pressure ulcers
  - Infection
<table>
<thead>
<tr>
<th>Hazard</th>
<th>How to Assess</th>
<th>When to Assess</th>
<th>How to Prevent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disability</td>
<td>Ask the patient or the nurse if the patient is getting out of bed for every meal and walking 3-4 times daily.</td>
<td>Daily</td>
<td><strong>Promote mobility.</strong> Order physical therapy consultation, avoid bedrest orders, remove unnecessary catheters, write for patient to be out of bed for all meals and to ambulate at 3-4 times daily.</td>
</tr>
<tr>
<td>Delirium</td>
<td>Look for signs of inattentiveness, disorganized thinking or changes in consciousness.</td>
<td>Daily</td>
<td><strong>Promote mobility.</strong> Provide patient with eyeglasses, hearing aids, frequent orientation with calendars and clocks. Avoid sedating medications, restraints, unnecessary catheters.</td>
</tr>
<tr>
<td>Depression</td>
<td>Over the last 2 weeks, have you felt down, depressed, or hopeless? Lost interest in or pleasure in doing things?</td>
<td>At discharge</td>
<td><strong>Promote mobility.</strong> Avoid sedating medications. Avoid anticholinergic medications.</td>
</tr>
<tr>
<td>Falls</td>
<td>Have you fallen in the past 6 months?</td>
<td>At admission</td>
<td><strong>Promote mobility.</strong> Provide patient with eyeglasses, hearing aids, frequent orientation with calendars and clocks. Avoid sedating medications, restraints, unnecessary catheters. Address incontinence.</td>
</tr>
<tr>
<td>Incontinence</td>
<td>Do you have trouble controlling your urine, feces? Have you had accidents in the past 6 months?</td>
<td>At admission and during hospitalization for prolonged hospitalizations.</td>
<td><strong>Promote mobility.</strong> Avoid anticholinergic medications and bladder catheterization. Use scheduled voiding while awake.</td>
</tr>
<tr>
<td>Constipation</td>
<td>When was your last bowel movement? Review nursing documentation regarding last bowel movement.</td>
<td>Daily</td>
<td><strong>Promote mobility.</strong> Maintain hydration. Provide fiber in diet. Provide laxatives such as senna for patients receiving opiates for pain.</td>
</tr>
<tr>
<td>Pressure Ulcers</td>
<td>Skin examination.</td>
<td>Daily</td>
<td><strong>Promote mobility.</strong> Frequent position changes (every 2 hours) for patients that are bedbound. Maintain nutritional state. Keep skin dry. Consider pressure reducing mattress.</td>
</tr>
<tr>
<td>Infection</td>
<td>Is bladder catheter or IV catheter present?</td>
<td>Daily</td>
<td><strong>Promote mobility.</strong> To stimulate deeper breathing. Remove unnecessary bladder and intravenous catheters.</td>
</tr>
<tr>
<td>Inappropriate prescribing</td>
<td>Review all medications for polypharmacy, drug-drug interactions, and appropriate dosages.</td>
<td>Daily</td>
<td>Review all medications for efficacy and appropriateness in older adults, considering prognosis, goals of care, and need for monitoring.</td>
</tr>
</tbody>
</table>
Delirium

- Association with ADL decline at hospital discharge and 3 month follow-up

Delirium

- Hospital level factors:
  - Restraint use
  - Multiple new medications added
  - Use of benzodiazepines, anticholinergic medications
  - Bladder catheter use
Recovery?

J Amer Geriatr Soc. 2008;56(12):2171-2179
Recovery

- Few studies
- Baseline IADL function, cognitive impairment at admission, reason for admission, and degree of disability at discharge
# Death

## Walter Prognostic Index

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Gender</td>
<td>1</td>
</tr>
<tr>
<td>ADL dependencies at discharge</td>
<td></td>
</tr>
<tr>
<td>In 1-4</td>
<td>2</td>
</tr>
<tr>
<td>In all</td>
<td>5</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>2</td>
</tr>
<tr>
<td>Cancer</td>
<td></td>
</tr>
<tr>
<td>Solitary</td>
<td>3</td>
</tr>
<tr>
<td>Metastatic</td>
<td>8</td>
</tr>
<tr>
<td>Creatinine &gt;3.0</td>
<td>2</td>
</tr>
<tr>
<td>Albumin</td>
<td></td>
</tr>
<tr>
<td>3.0-3.4</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 3.0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

- 1 point: 4%
- 2-3 points: 19%
- 4-6 points: 34%
- ≥7 points: 64%
Outline

- Hospitalization-associated disability
  - Incidence
  - Outcomes
  - Risk factors - patient and hospital level
  - Recovery
- **Interventions**
- Summary
Interventions

- Hospital Elder Life Program (HELP)
- Nurses Improving Care for Health System Elders (NICHE)
- Geriatric Evaluation and Management (GEM) Units
- Acute Care for Elders (ACE) Units
ACE Units

- Focus on function
- Identify risk factors (functional, cognitive, social) early and address
- Early planning for discharge home
- Medication review
Focus on Function

- 1 extra CNA FTE for every 12 patients
  - Out of bed to chair for meals
  - Community dining
  - Ambulation daily
  - Timed voiding
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