A Focus on Function: The next frontier in reducing avoidable hospital readmissions

Jennifer Stevens-Lapsley, PT, PhD
Professor
Director, Rehabilitation Science PhD Program
University of Colorado

VA Eastern Colorado Health Care System
Geriatric Research, Education and Clinical Center
Objectives

• Understand how hospital-associated deconditioning in older adults impairs functional mobility and increases rehospitalization risk.

• Appreciate current barriers to changing practice patterns for deconditioned older adults following hospitalization.

• Recognize strategies that better target deconditioning across the continuum of care from hospital to home settings.
Impaired Function in Older Adults Following Hospitalization

- During hospitalization, older adults spend \( \sim 83\% \) of time in bed and \( 12\% \) of the time in a chair. (Brown CJ 2009)

- 68% of patients discharged from the hospital are below pre-hospitalization level of function. (Gill TM 2009)

- Hospitalized older adults are 61 times more likely to develop a disability compared to those who are not hospitalized (Gill TM 2004)

- Older adults with medical deconditioning have higher rates of readmission and lower rates of discharge to the community. (Kortebein P 2008)
Function and Readmissions

Archives of Physical Medicine and Rehabilitation

Original article
Functional Status Impairment Is Associated With Unplanned Readmissions

Original Research
Journal of General Internal Medicine
First online: 09 May 2015

Functional Status Outperforms Comorbidities in Predicting Acute Care Readmissions in Medically Complex Patients

RESEARCH ARTICLE

Functional Status Predicts Acute Care Readmissions from Inpatient Rehabilitation in the Stroke Population
Low Physical Function Increases Risk for Rehospitalization

Pre-admission physical function and hospital readmissions

Pre-admission ADL impairments are associated with increased risk of hospital readmission

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Table 3. Functional Impairment and Readmission for Targeted Medicare Diagnoses

<table>
<thead>
<tr>
<th>Functional Impairment</th>
<th>Readmission</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Odds Ratio (95% CI)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>Unadjusted</td>
<td>Adjusted</td>
</tr>
<tr>
<td>No impairments</td>
<td>1 [Reference]</td>
<td>1 [Reference]</td>
<td></td>
</tr>
<tr>
<td>Difficulty with ≥1 IADL</td>
<td>1.08 (0.74-1.57)</td>
<td>0.97 (0.66-1.44)</td>
<td></td>
</tr>
<tr>
<td>Difficulty with ≥1 ADL</td>
<td>1.32 (0.96-1.82)</td>
<td>1.14 (0.82-1.58)</td>
<td></td>
</tr>
<tr>
<td>Dependency in 1-2 ADLs</td>
<td>1.44 (1.03-2.02)</td>
<td>1.11 (0.77-1.61)</td>
<td></td>
</tr>
<tr>
<td>Dependency in ≥3 ADLs</td>
<td>2.60 (1.69-3.99)</td>
<td>1.70 (1.04-2.78)</td>
<td></td>
</tr>
</tbody>
</table>

Probability of Having an ER Visit Across Different Levels of Function

Physically Frail = Gait Speed < 0.6 m/s AND inability to rise from a chair without arms

Pre-Frail = One of the above

Not Frail: None of the above
Low Physical Function Increases Risk for Long-Term Disability

Hospital Readmissions: A Growing Public Health Concern

• 1 in 5 Medicare beneficiaries re-hospitalized within 30 days

• Consistent across most healthcare settings
Co$t of Hospital Readmissions

1,800,000 readmissions

$24,000,000,000

AHRQ Report:
Co$t of Hospital Readmissions

Congestive Heart Failure ➔ $1.7 Billion

Sepsis ➔ $1.4 Billion

Pneumonia ➔ $1.1 Billion

COPD ➔ $924 Million

Timing of Readmissions

Burke et al, 2016
Contributing Factors...

65% of Medicare beneficiaries experience 2+ care transitions

Healthcare settings are “silos”, with little communication
Are Readmissions Preventable?
Non-modifiable Risk Factors

- Socioeconomic status
- Age
- Length of hospital stay

Walraven et al, 2011
Potentially Modifiable Risk Factors

- Adverse drug reactions
- Inadequate D/C planning
- Lack of PCP Follow-Up
- AND .......... IMPAIRED PHYSICAL FUNCTION!

(Walraven et al, 2011)
Since readmission began being publically reported and penalties announced (2007-2015)

• All-cause readmissions ↓ 20% for target conditions

• All-cause readmissions ↓ from 15.3 to 13.1% for non-target conditions

Zuckerman et al, 2016
Opportunity for Rehab to Improve Patient Outcomes
Barriers for implementation of optimal practice patterns to maximize function

1. Reimbursement-Based vs Evidence-Based Practice

2. Limited incentives for high quality transitional care (few ACO’s)

3. Fear of litigation

4. Current emphasis is on returning patients to prior level of function (which is often low)

5. Lack of awareness of more effective clinical care strategies
Barriers for implementation of optimal practice patterns

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Reimbursement Based Practice

• **Acute Care:**
  - Payment system incentivizes quicker discharges
  - Resulted in marked functional loss and referrals to post acute care
  - Now...more penalties for re-hospitalizations, thus more conservative discharge recommendations

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**Sample readmission penalty scenario**

| Total admissions for an appropriate condition = | 1000 |
| Average Payment = | $5,000 |
| Actual readmissions = | 51 |
| Expected readmissions = | 50 |
| Hospital-specific readmissions adjustment factor (\((51/50) - 1\)) = | 0.02 |

**Readmission penalty formula hospitals believe is fair:**

\[(0.02) \times 5,000 \times 50 \text{ expected readmissions} = 5,000\]

**Readmission penalty formula currently in the regulation:**

\[(0.02) \times 5,000 \times 1,000 \text{ total admissions} = 100,000\]
Reimbursement-Based Practice

• **Skilled Nursing Facilities**
  • Length of stay is often related to reimbursement
  • Average LOS: 25 days, with many discharged immediately after 20 fully paid Medicare days
  • Therapy intensity measured by minutes of therapy (RUG levels), but therapy content is largely low intensity and often driven by staffing levels versus patient need.
Reimbursement-Based Practice

• **Home Health Care**
  - Therapy visits are often limited by agencies to avoid scrutiny
  - Rates of 6-9 therapy visits have increased, whereas 10-13 visit episodes have decreased with new payment rules
  - “Homebound” rule strictly interpreted by HH Agencies, disqualifying many patients who still are below prior level of function and cannot access additional services.
Barriers for implementation of optimal practice patterns

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Limited incentives for high quality transitional care

• Very limited coordination of care across settings
  • Hospital ➔ SNF ➔ Home Health
• Sometimes, limited coordination across providers within a setting
• Changes that may help prioritize transitional care:
  • The Improving Medicare Post-Acute Care Transformation (IMPACT) Act
  • Accountable Care Organization Models/Bundled Payments
  • Bundled Care
Barriers for implementation of optimal practice patterns

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Fear of Litigation

• Practice of “negative defensive medicine” prevalent in many settings, esp. older adults
  • Mobility is often avoided by nursing and CNAs because it is perceived as an unnecessary fall risk.
  • Many have said “I don’t want a fall on my shift.”
Fear of Litigation

• Have we taken the “above all else...do no harm principle” to an extreme?
  • Falls are more quantifiable and are more likely to result in “fault” than deconditioning.
  • Therefore, we avoid supervised and unsupervised mobility to decrease the risk of falls...at risk of deconditioning.

• Would more concrete evidence-based guidelines in individual patient populations help decrease litigation fear?
Barriers for implementation of optimal practice patterns

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5. Lack of awareness of more effective clinical care strategies
Current emphasis is on returning patient to prior level of function

- **Current paradigm**: return patient to prior level of function (i.e. the absence of physical dependency)

- Disregards where the level a patient is or was functioning relative to threshold
Threshold of Independence
Barriers for implementation of optimal practice patterns

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Lack of awareness of more effective clinical care strategies

• Safe dosage of exercise for medically complex patients
  • high intensity is necessary, but perceived unsafe

• Inconsistent identification of mobility cut-offs for adverse health risks (gait speed, strength)
Are current physical therapy interventions delivered at the appropriate intensity to optimize function?

Don’t prescribe under-dosed strength training programs for older adults. Instead, match the frequency, intensity and duration of exercise to the individual’s abilities and goals.
Other disciplines concur....nursing

Don’t let older adults lay in bed or only get up to a chair during their hospital stay.
Current Rehabilitation Hierarchy for Older Adults Following Hospitalization

- Resistance Training
- Low Intensity Aerobic Training
- Motor Control based gait, balance, and ADL training
- General Conditioning Activities
Updating Practice Patterns for Older Adults Following Hospitalization

• Shift from conservative, low-intensity interventions → high-intensity interventions

• Based on American College of Sports Medicine (ACSM) Guidelines and the American Geriatrics Society (AGS)
Updated Rehabilitation Hierarchy for Older Adults Following Hospitalization

- **High Intensity Resistance Training**
- **Moderate to High Intensity Motor Control Based Gait, Balance, and ADL Training**
- **Moderate Intensity Aerobic Training**
- **Gen. Conditioning**

Falvey et. al. *PTJ* 2015
Current Rehabilitation

- General Conditioning Activities
  - Gait, Balance, and ADL training
  - Aerobic Training
  - Resistance Training

Low-Physiologic Intensity

Progressive Rehabilitation

- Resistance Training
  - Gen Conditioning
  - Aerobic Training
  - Gait, Balance, and ADL training

High-Physiologic Intensity
How can we improve function?

CHANGE THE TREATMENT PHILOSOPHY

Focus on dosing intensity
High-Intensity Strengthening Improves LE Strength

High-intensity strength training in nonagenarians. Effects on skeletal muscle.
Fiatorone MA¹, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ.

1 Repetition Max (kg)

Baseline Week 8

 Increased Strength

JAMA. 1990 Jun 13;263(22):3029-34
High-Intensity Strengthening Improves Physical Function

High-intensity strength training in nonagenarians. Effects on skeletal muscle.
Flataarone MA, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ.

JAMA. 1990 Jun 13;263(22):3029-34.
Strength Training of the UE Improves Cognitive, and ADL function

![Graph showing the positive effects of physical training on ADL, Cognitive Status, and 1RM Arm Curl percentage change. Exercise Group shows significant improvements compared to the Control Group.](image-url)
Rationale for High-Intensity
What is High-Intensity Rehabilitation?

- High-intensity: provide a stronger and different stimulus (e.g., weight, challenge) EVERY TIME

- Objectively progress the patient
Do light weights generate forces equivalent to daily functional activities?
High-Intensity Prescription

TO FAILURE

INTENSITY, STRENGTH-ENDURANCE

STRENGTH ZONE

MAXIMAL STRENGTH-ENDURANCE CURVE

ENDURANCE ZONE

fatigue

Reps

8-12

>12

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### High-Intensity Prescription

<table>
<thead>
<tr>
<th>% 1RM</th>
<th># of Reps to Failure</th>
<th>RPE (6-20)</th>
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<tbody>
<tr>
<td>40</td>
<td>16 RM</td>
<td>11</td>
</tr>
<tr>
<td>50</td>
<td>14 RM</td>
<td>12</td>
</tr>
<tr>
<td>60</td>
<td>12 RM</td>
<td>13</td>
</tr>
<tr>
<td>70</td>
<td>10 RM</td>
<td>14</td>
</tr>
<tr>
<td>80</td>
<td><strong>8 RM</strong></td>
<td>15</td>
</tr>
</tbody>
</table>

8RM or 80% of 1RM is 8 complete repetitions with failure on the 9th rep.
High-Intensity Prescription

- **Failure** is defined as the **inability to complete final rep** through full, available ROM without compensation
  - Sudden increase in speed to overcome resistance
    - Fluidity/rhythmicity of movement
      - **Cue rhythm by counting aloud**
    - Improper form/significant compensation
      - Loss of eccentric control
        - **Cue form (tactile/verbal)**
  - Requires one level increase in level of assist
    - (e.g., min -> mod assist)
Failure Video

Sit to Stand
No Weight
RPE Scale
Patients in Home Health Demonstrate Greater Improvements with High-Intensity Rehabilitation

• Reduced risk for hospital readmission

• Improved ability to ambulate in the community

Stevens-Lapsley et al., *Clinical Rehabilitation*. 2015
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Additional Students
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Riley Ruse
Sammi Stolper
Deanna Maurer
Brian Burkhardt
Lucine Papazian
Johna Iannitto
**PhD in Rehabilitation Science**

**The Work We Do**
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- Health services research
- Translational research
- Exercise science research
- Implementation science research

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- Curriculum customized to meet individual student interests
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- FULLY FUNDED