

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



Rehabilitation Science
PhD Program

UNIVERSITY OF COLORADO
ANSCHUTZ MEDICAL CAMPUS

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**



University of Colorado
Anschutz Medical Campus



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 **~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

Volume 94, Issue 10, October 2013, Pages 1951–1958



Original article

Functional Status Impairment Is Associated With Unplanned Readmissions

Original Research
Journal of General Internal Medicine
November 2015, Volume 30, Issue 11, pp 1688–1695

First online: 09 May 2015

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

OPEN ACCESS PEER-REVIEWED

RESEARCH ARTICLE

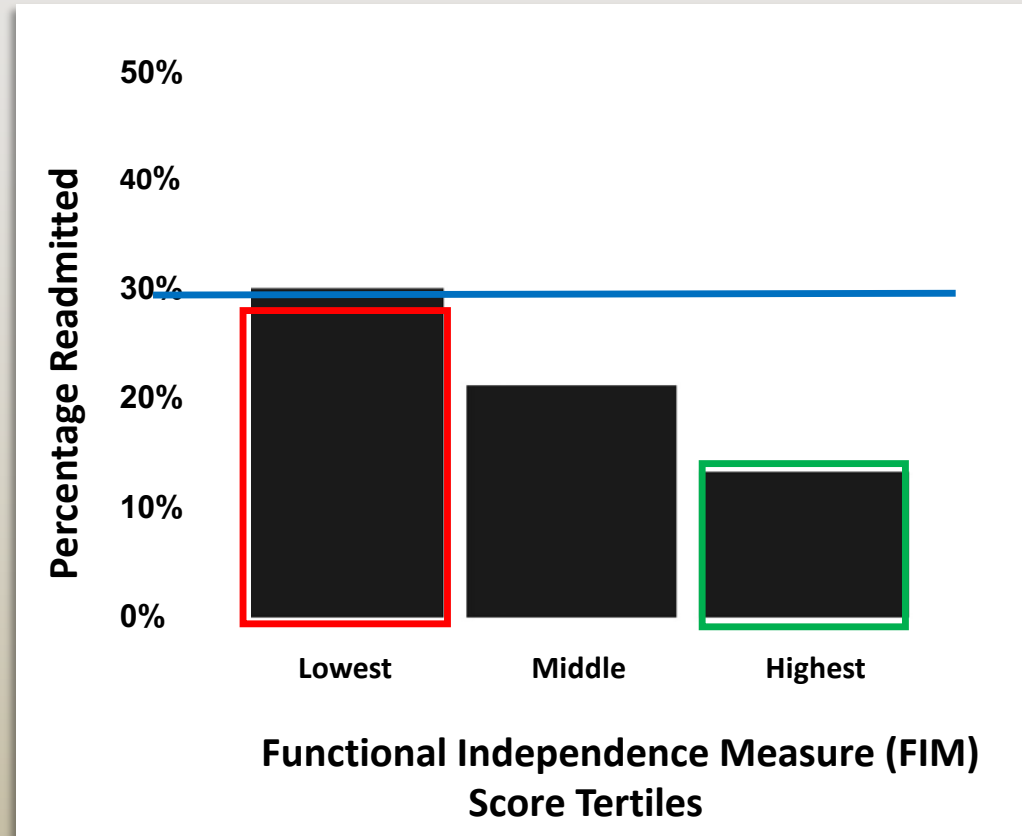
Functional Status Predicts Acute Care Readmissions from Inpatient Rehabilitation in the Stroke Population



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Low Physical Function Increases Risk for Rehospitalization



Hoyer et al. Arch. Phys Med & Rehabil. 2013;94;1951-8

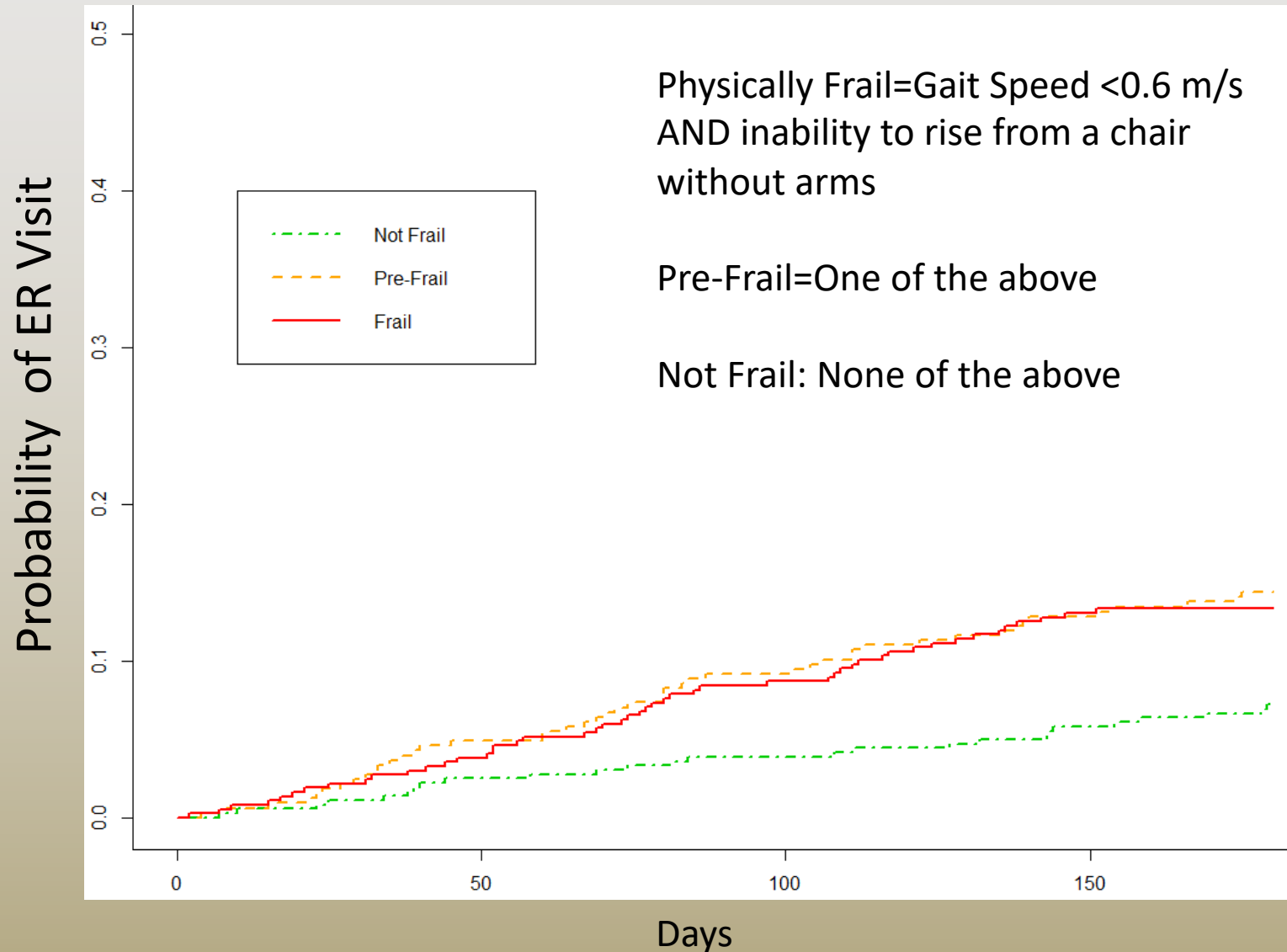
Pre-admission physical function and hospital readmissions

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

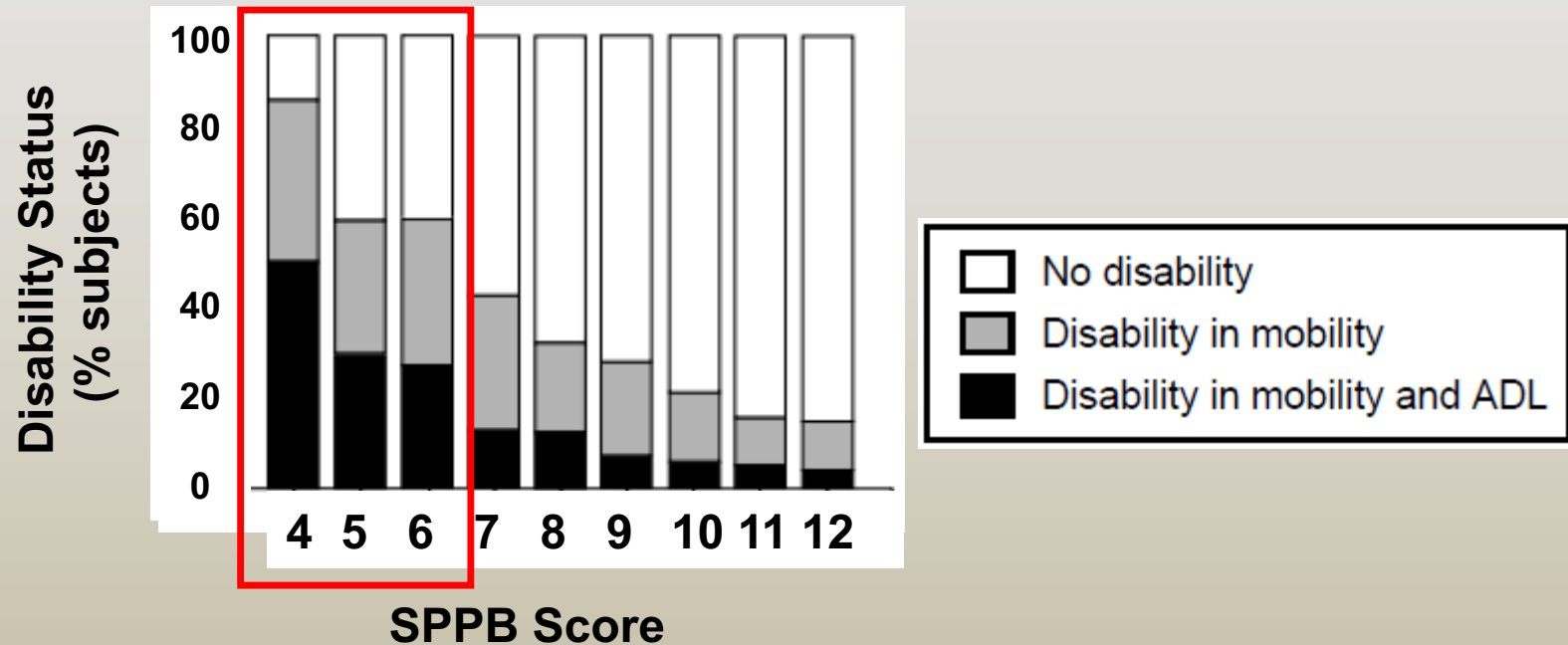
Table 3. Functional Impairment and Readmission for Targeted Medicare Diagnoses ^a		
Functional Impairment	Readmission	
	Odds Ratio (95% CI)	
	Unadjusted	Adjusted ^b
Overall		
No impairments	1 [Reference]	1 [Reference]
Difficulty with ≥ 1 IADL	1.08 (0.74-1.57)	0.97 (0.66-1.44)
Difficulty with ≥ 1 ADL	1.32 (0.96-1.82)	1.14 (0.82-1.58)
Dependency in 1-2 ADLs	1.44 (1.03-2.02)	1.11 (0.77-1.61)
Dependency in ≥ 3 ADLs	2.60 (1.69-3.99)	1.70 (1.04-2.78)

Greysen et al (2015)

Probability of Having an ER Visit Across Different Levels of Function



Low Physical Function Increases Risk for Long-Term Disability



Guralnik et al. *NEJM*. 1995; 332 (9):556-561



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:

<http://www.hcup-us.ahrq.gov/reports/statbriefs/sb172-Conditions-Readmissions-Payer.pdf>



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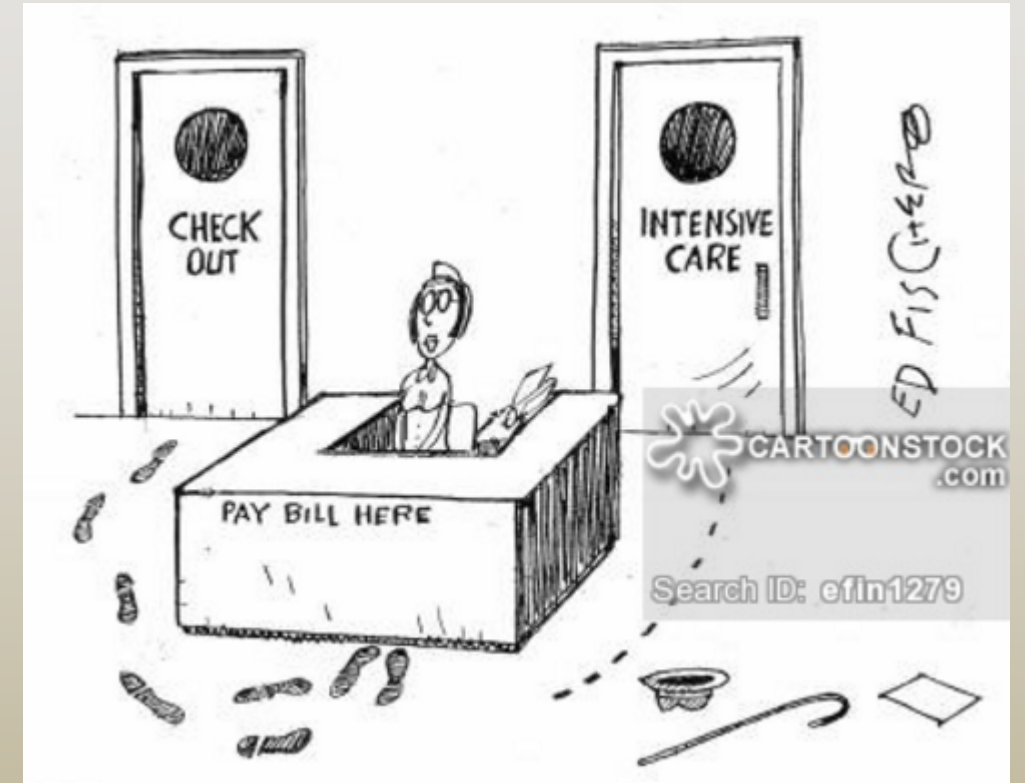
Co\$t of Hospital Readmissions

Congestive Heart Failure → \$1.7 Billion

Sepsis → \$1.4 Billion

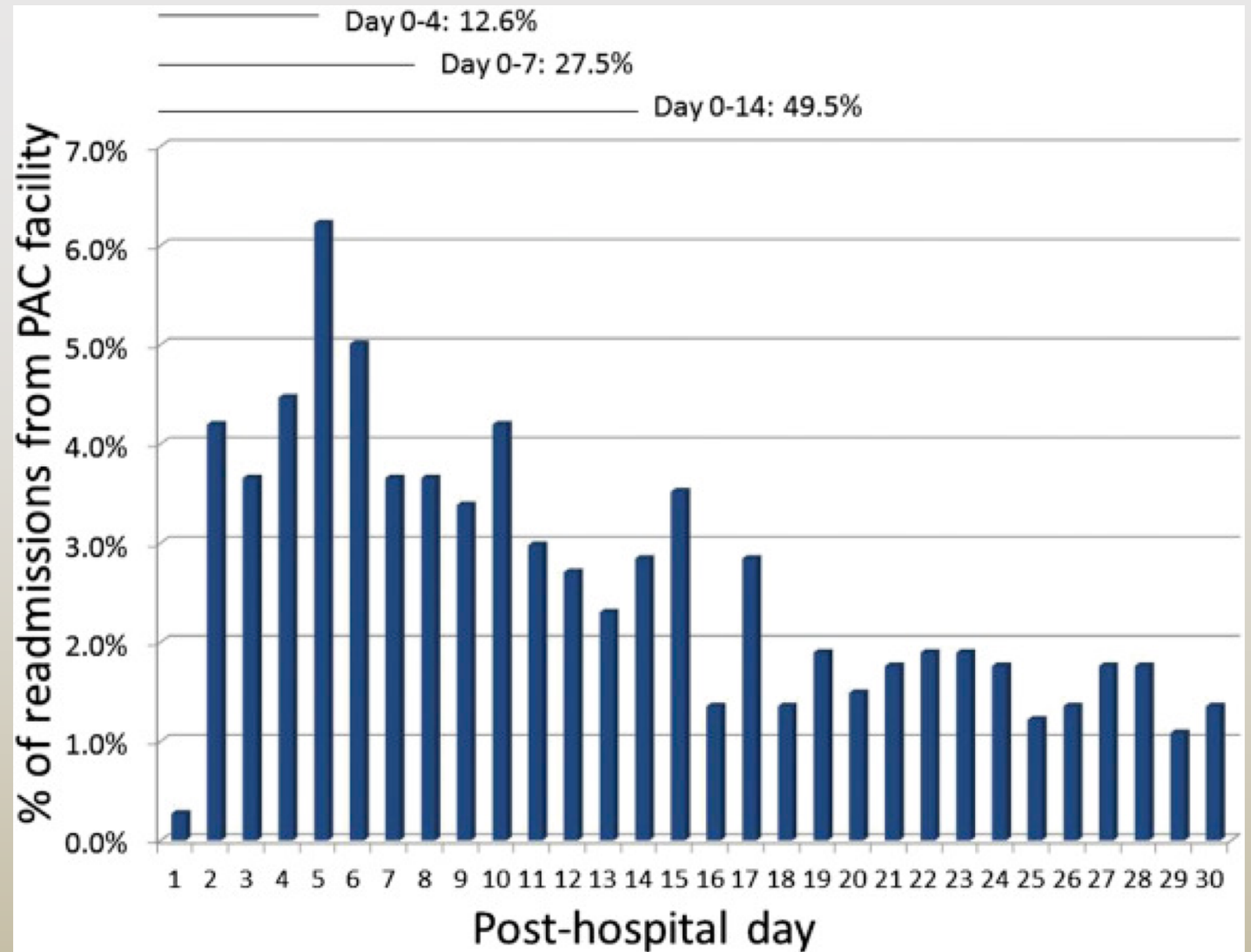
Pneumonia → \$1.1 Billion

COPD → \$924 Million



AHRQ Report: <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb172-Conditions-Readmissions-Payer.pdf>

Timing of Readmissions



Burke et al, 2016

Contributing Factors...

65% of Medicare beneficiaries experience
2+ care transitions

Healthcare settings are
“silos”, with little
communication

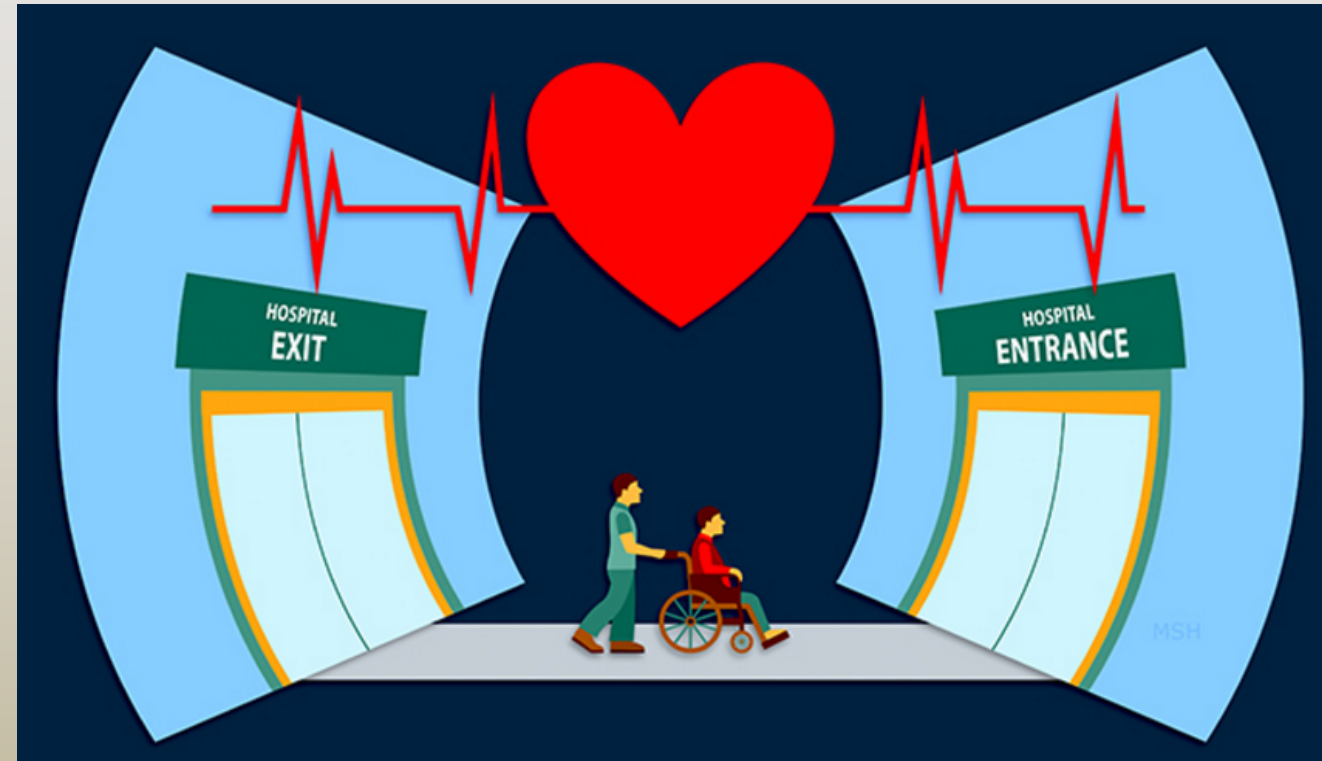


Are Readmissions Preventable?



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)

HOSPITAL ADMISSIONS



"For your hospital gown, do you prefer paper or plastic?"



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

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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

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:	
$(0.02) * \$5,000 * 50$ expected readmissions =	\$5,000
Readmission penalty formula currently in the regulation:	
$(0.02) * \$5,000 * 1,000$ 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



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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

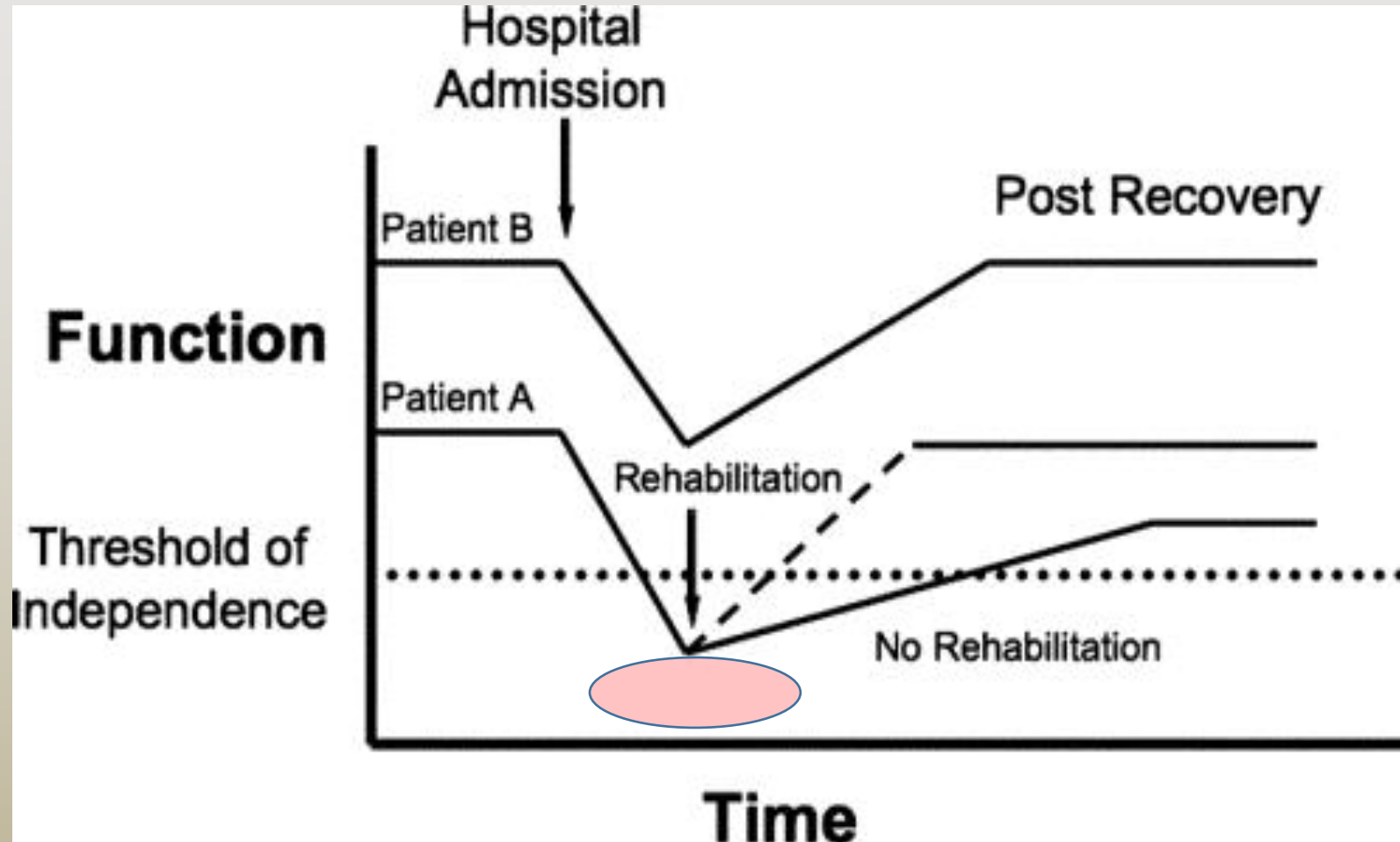
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Current emphasis is on returning patient to prior level of function

- **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.



American Physical Therapy Association™

**Five Things Physical Therapists
and Patients Should Question**



An initiative of the ABIM Foundation



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Other disciplines concur....nursing

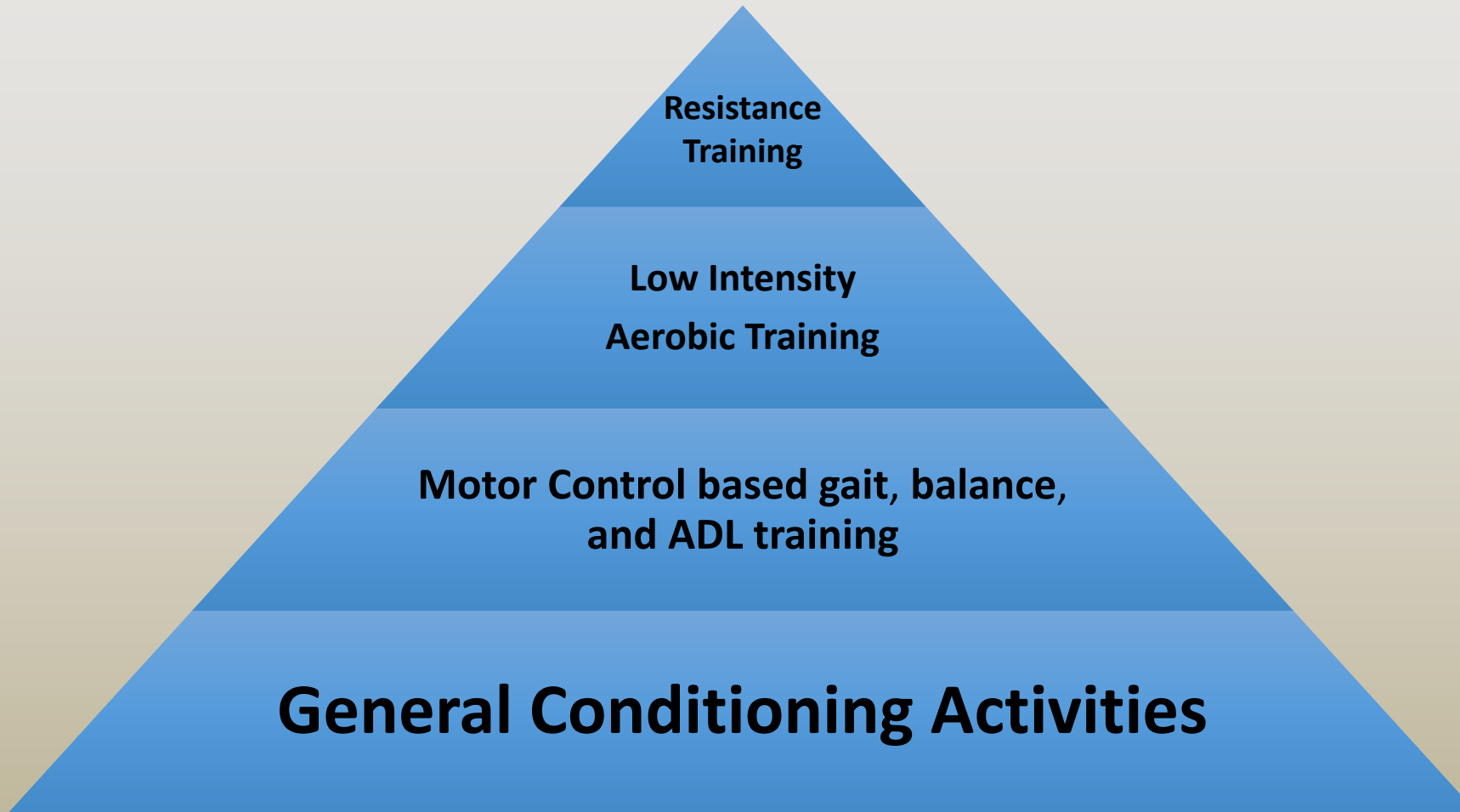
Don't let older adults lay in bed or only get up to a chair during their hospital stay.

 **Choosing
Wisely[®]**

An initiative of the ABIM Foundation



Current Rehabilitation Hierarchy for Older Adults Following Hospitalization

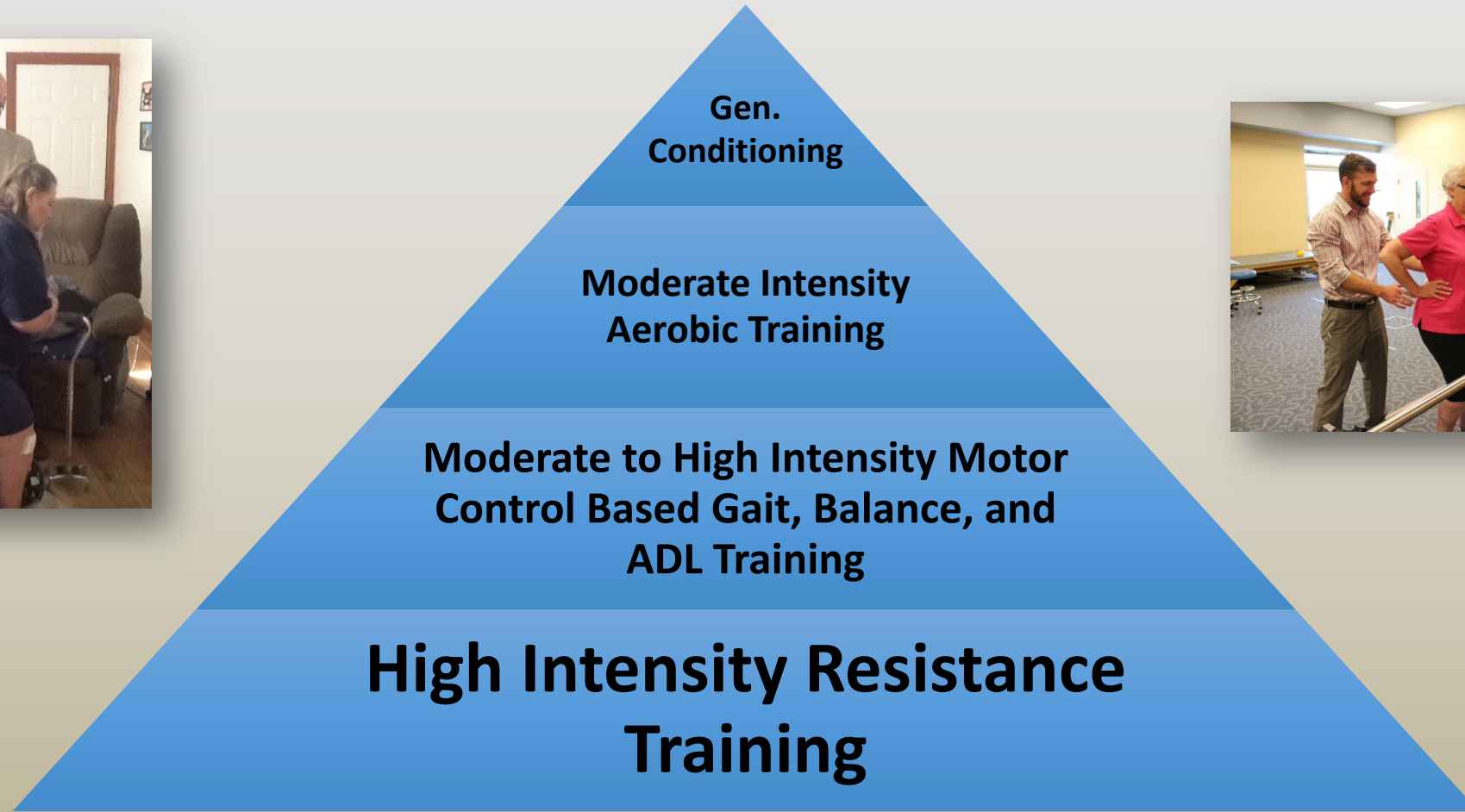


Updating Practice Patterns for Older Adults Following Hospitalization

- Shift from conservative, low-intensity interventions → **high-intensity interventions**
- Based on American College of Sports Medicine (**ACSM**) Guidelines and the American Geriatrics Society (**AGS**)

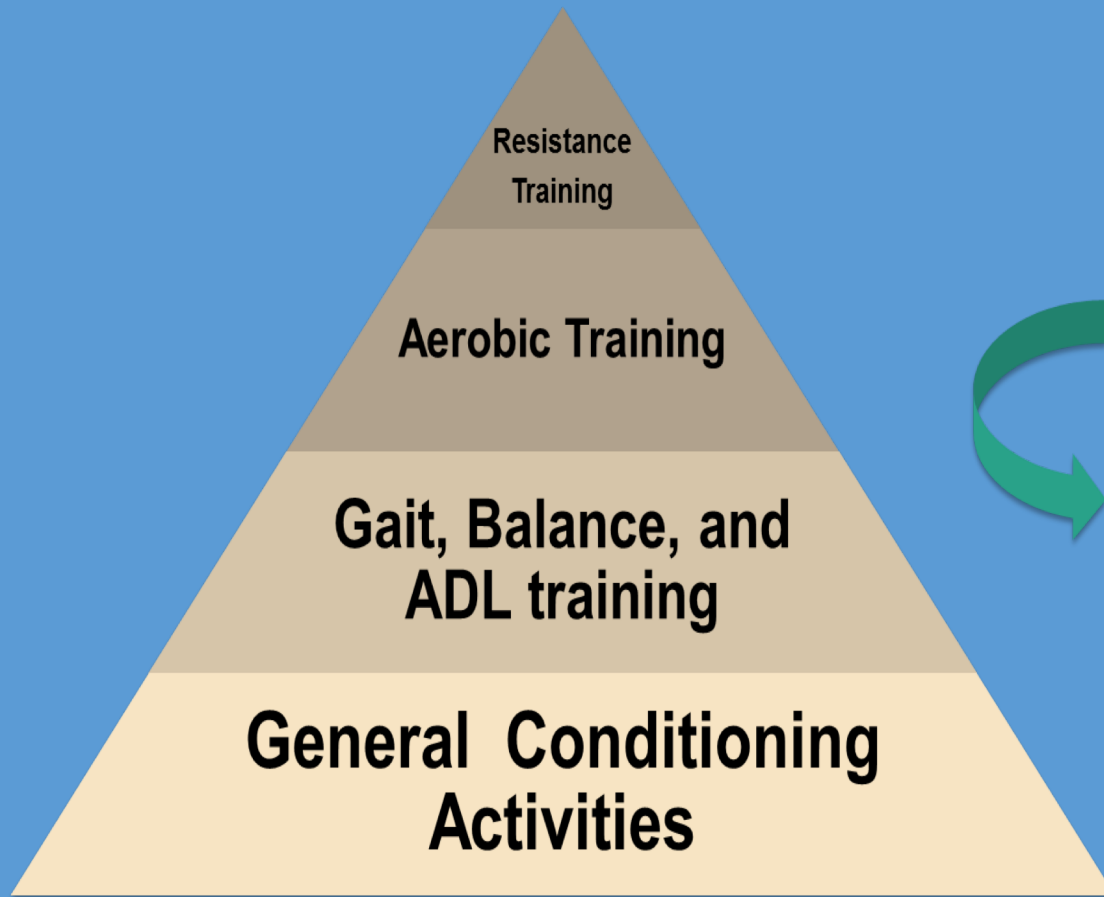


Updated Rehabilitation Hierarchy for Older Adults Following Hospitalization



Falvey et. al. PTJ 2015

Current Rehabilitation



Low-Physiologic Intensity

Progressive Rehabilitation



High-Physiologic Intensity



How can we improve function?

CHANGE THE TREATMENT PHILOSOPHY

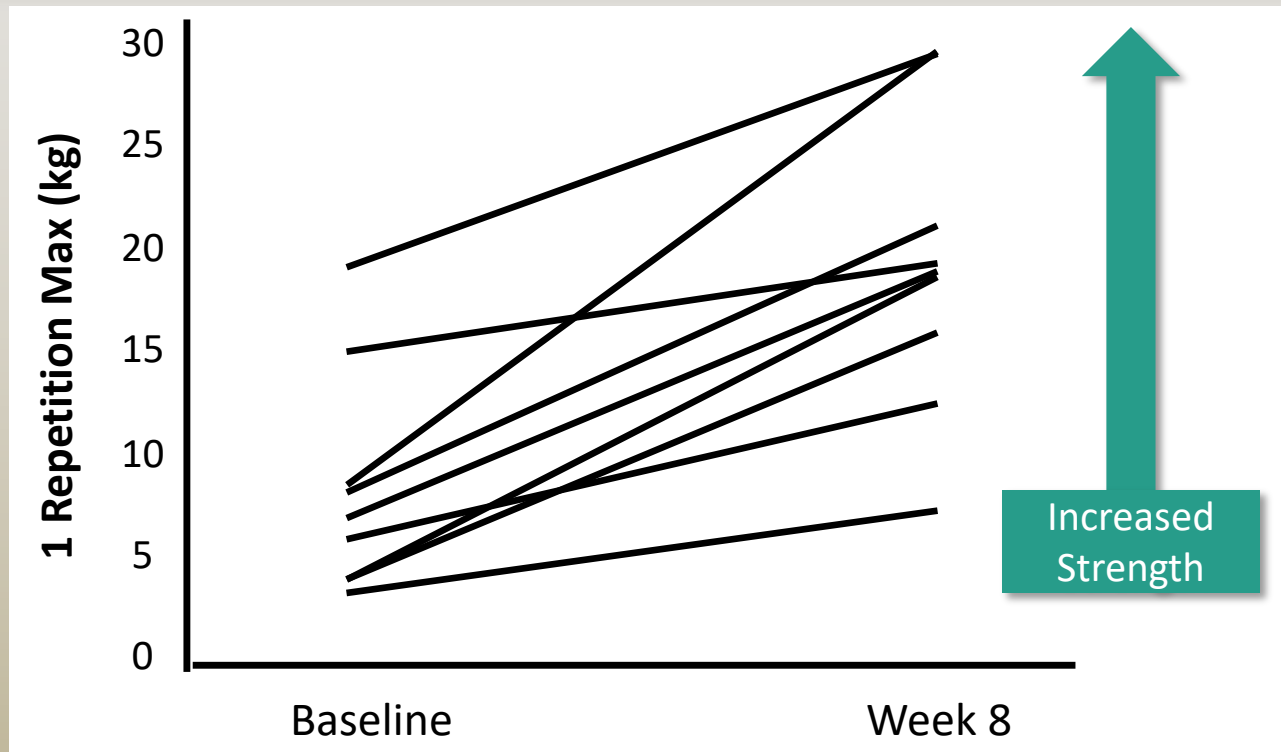
Focus on dosing intensity

High-Intensity Strengthening Improves LE Strength

[JAMA. 1990 Jun 13;263\(22\):3029-34.](#)

High-intensity strength training in nonagenarians. Effects on skeletal muscle.

[Fiatarone MA¹](#), [Marks EC](#), [Ryan ND](#), [Meredith CN](#), [Lipsitz LA](#), [Evans WJ](#).



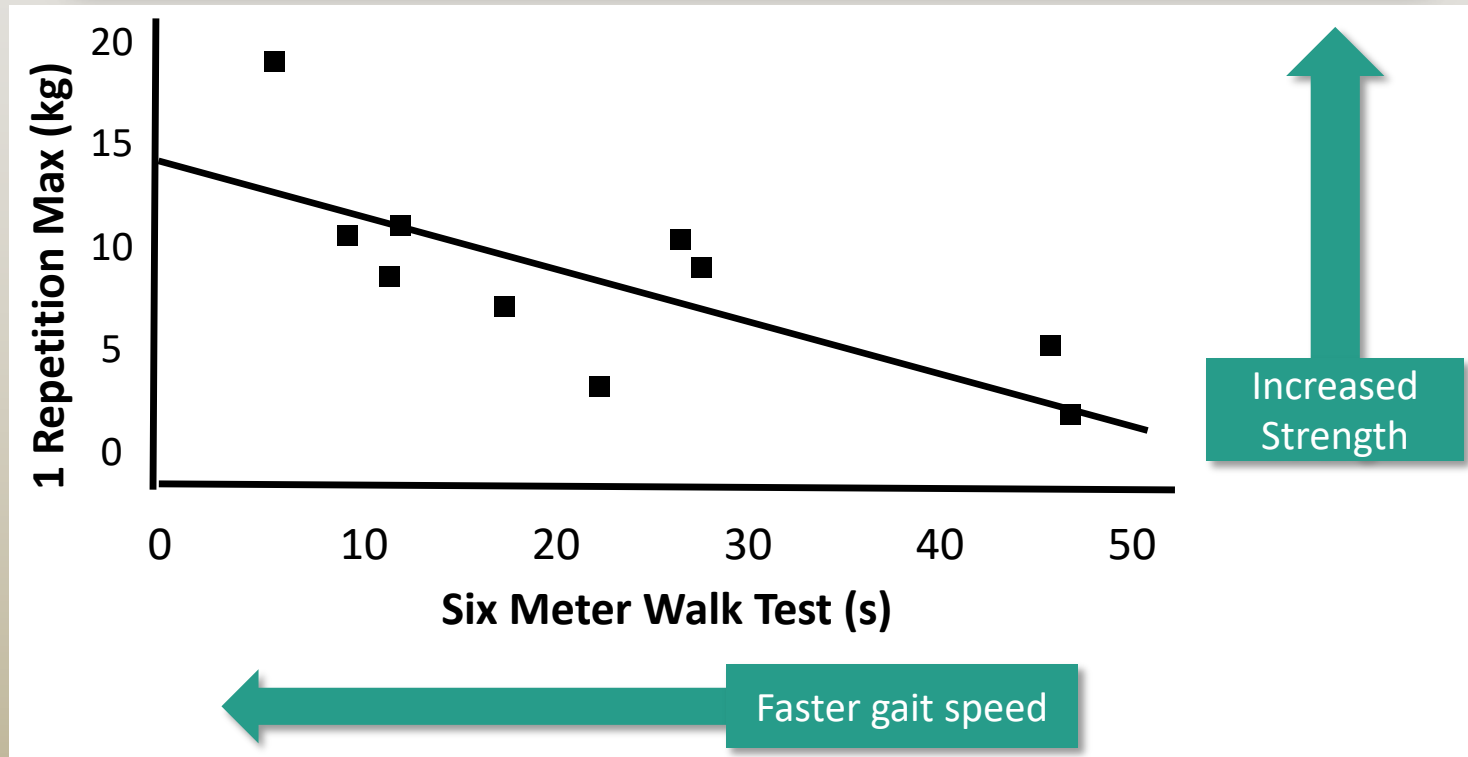
JAMA. 1990 Jun 13;263(22):3029-34

High-Intensity Strengthening Improves Physical Function

JAMA. 1990 Jun 13;263(22):3029-34.

High-intensity strength training in nonagenarians. Effects on skeletal muscle.

Fiatarone MA¹, Marks EC, Ryan ND, Meredith CN, Lipsitz LA, Evans WJ.

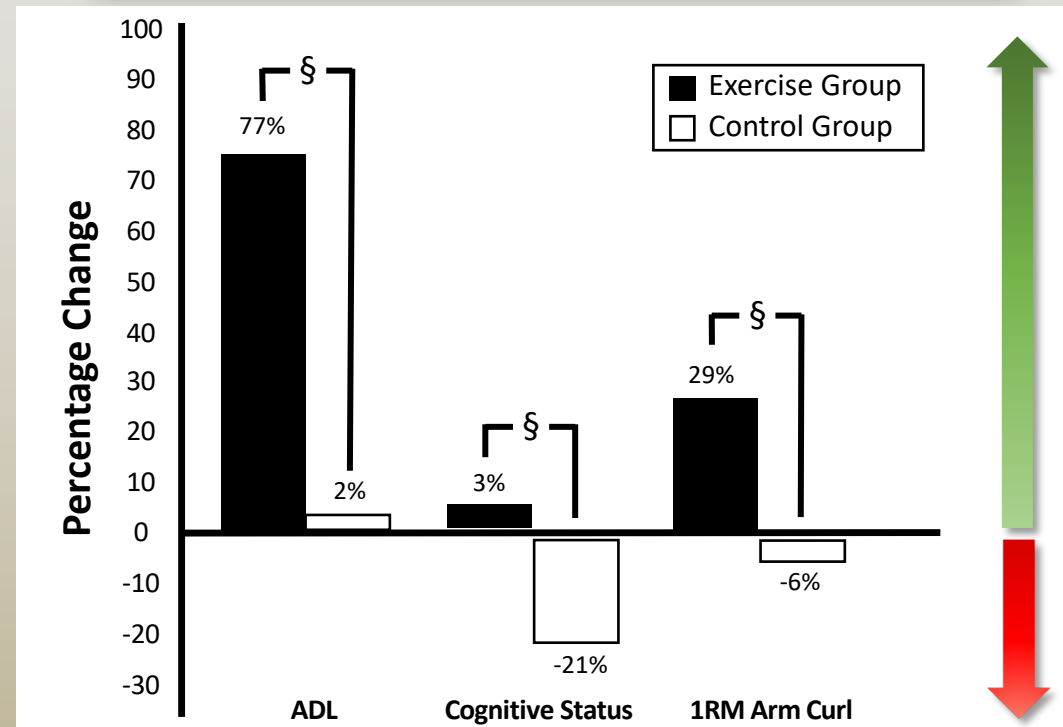


JAMA. 1990 Jun 13;263(22):3029-34

Strength Training of the UE Improves Cognitive, and ADL function

Positive Effects of Physical Training in Activity of Daily Living-Dependent Older Adults

Massimo Venturelli ^{a b} , Massimo Lanza ^a , Ettore Muti ^b & Federico Schena ^a



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

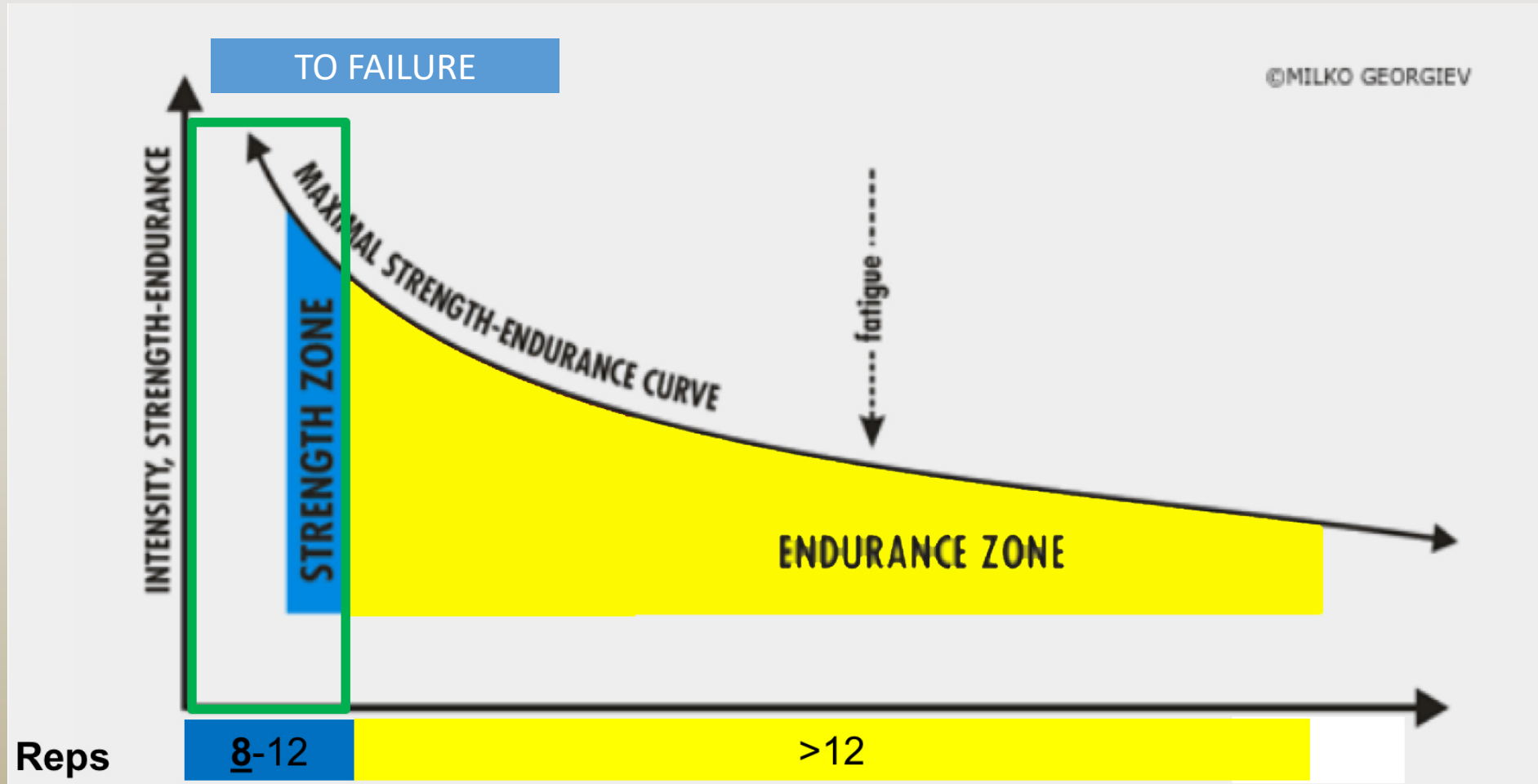
Do light weights generate forces equivalent to daily functional activities?



≠



High-Intensity Prescription



High-Intensity Prescription

% 1RM	# of Reps to Failure	RPE (6-20)
40	16 RM	11
50	14 RM	12
60	12 RM	13
70	10 RM	14
80	**8 RM**	15

8RM or 80% of 1RM is 8 complete repetitions with failure on the 9th rep



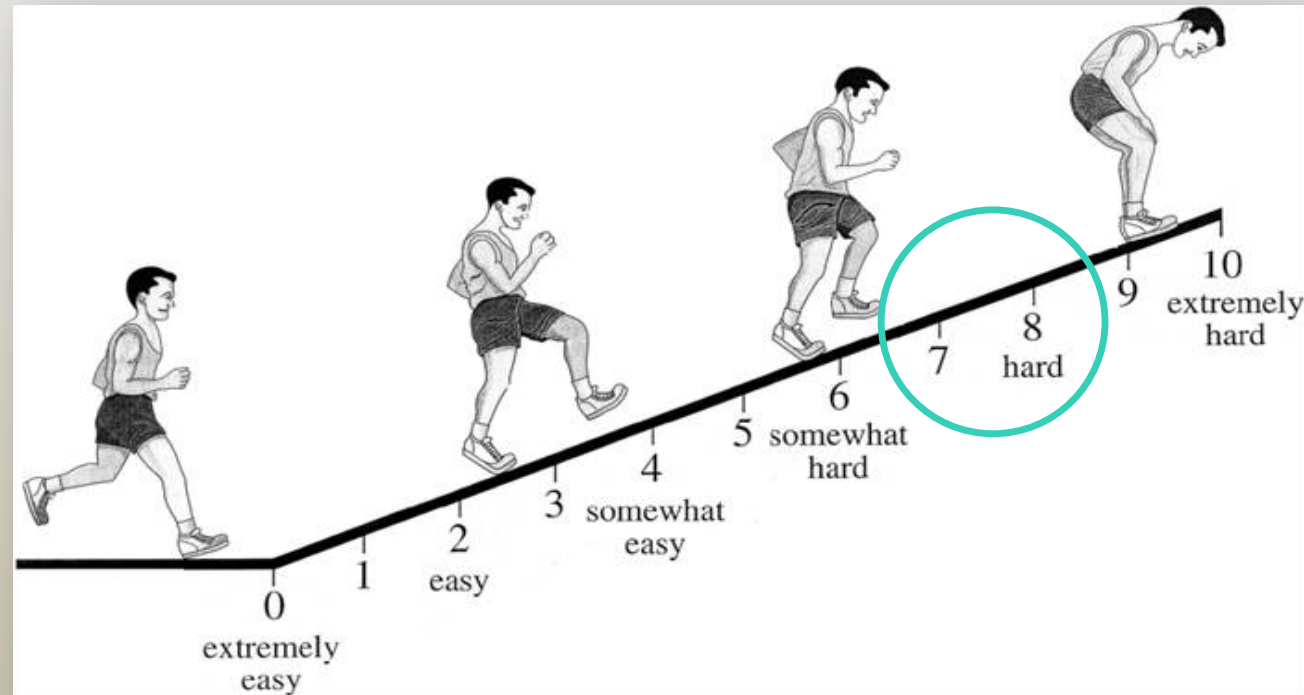
High-Intensity Prescription

- **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

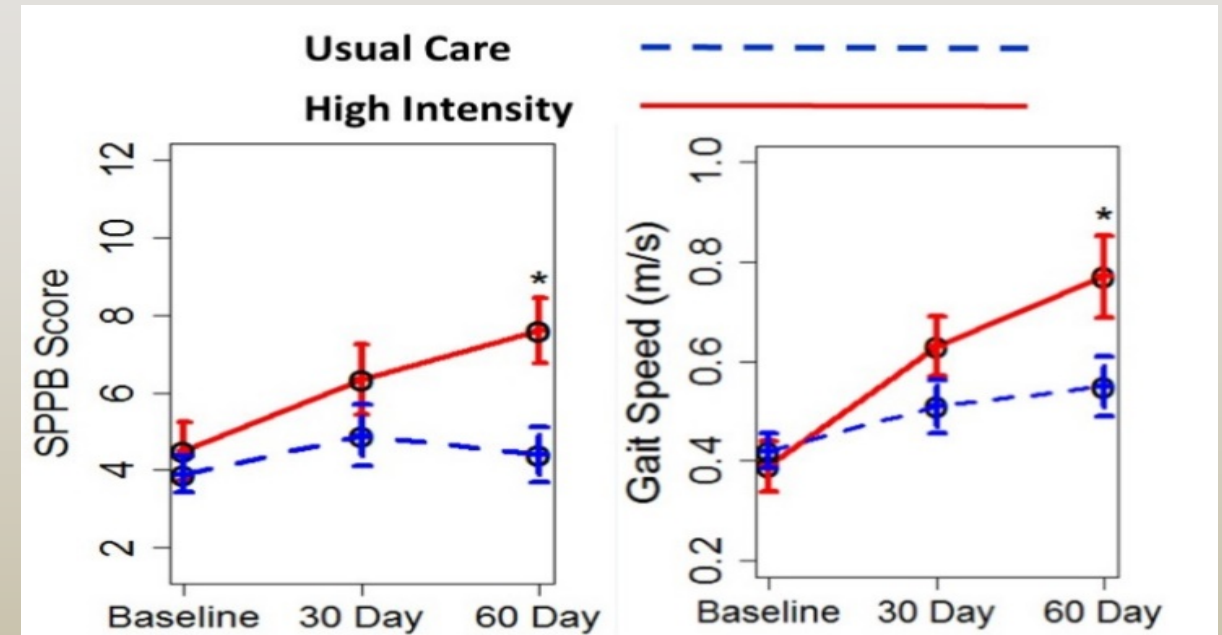


RPE Scale



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

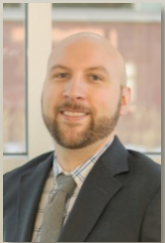
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University of Colorado Hospital Acute Care for the Elderly Unit



Amber Hales, MS, CCC-SLP
Donna Torbet



Gary Ruvins, JD
Tanya Budnikova, MBA



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Michael Muller
Jenny Shaver, PT, MS
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Andrea Kellogg, MA, CCC-SLP



Jessica Crovelli, PT, DPT



Inpatient Care Coordinators

Additional Students

Carol Baym
Riley Ruse
Sammi Stolper
Deanna Maurer
Brian Burkhardt
Lucine Papazian
Johna Iannitto



University of Colorado
Anschutz Medical Campus





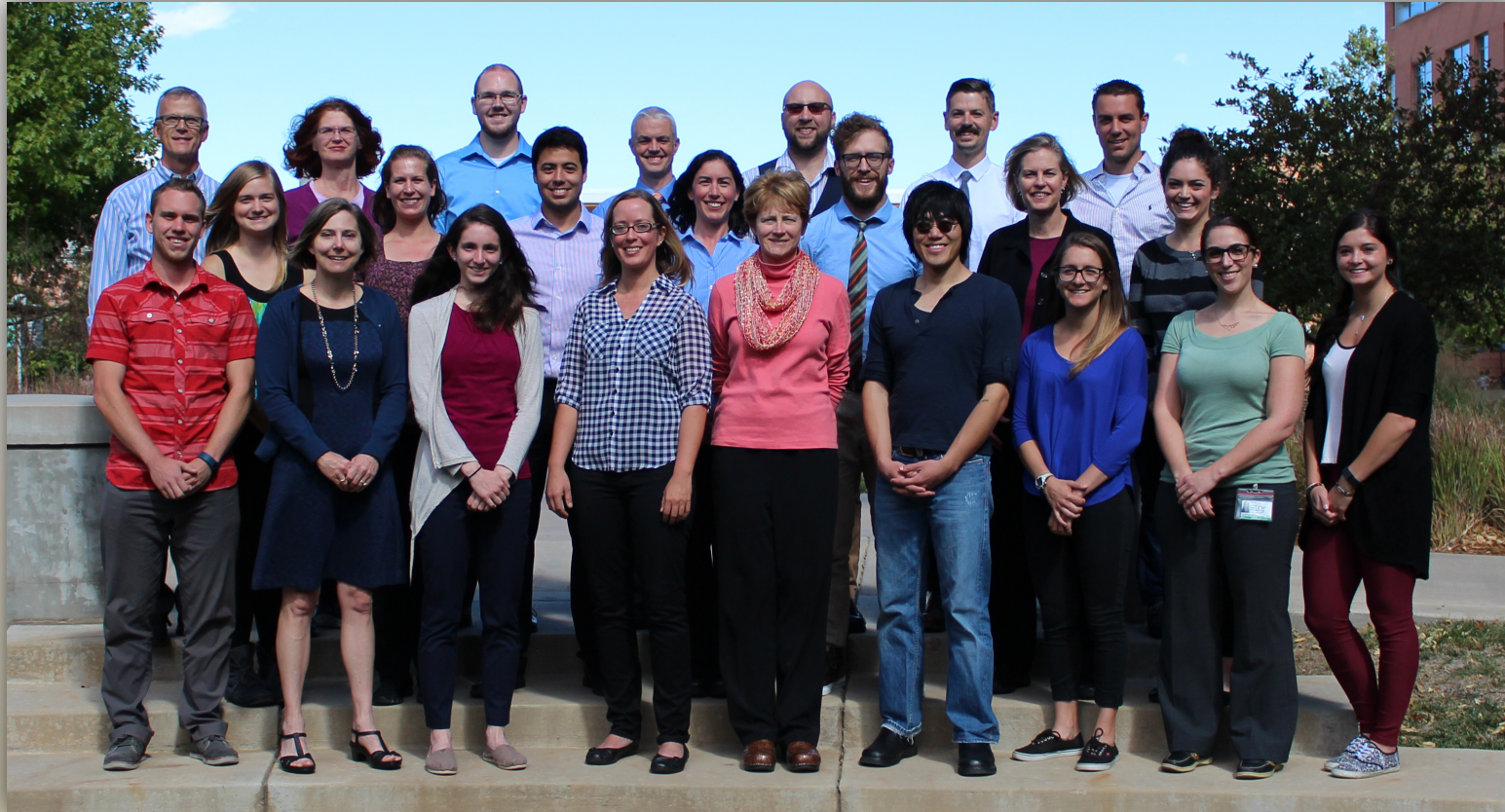
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Foundation for Physical Therapy

Acknowledgements



CU RESTORE Group

PhD in Rehabilitation Science



The Work We Do

- Clinical rehabilitation trials
- Health services research
- Translational research
- Exercise science research
- Implementation science research

Unique Attributes

- Nationally recognized research mentors
- Curriculum customized to meet individual student interests
- Strong record of student achievement and grant support
- **FULLY FUNDED**