

Fall Prevention: The Role of Exercise

(Project HomeStretch)

Anne Shumway-Cook, PT, PhD

Department of Rehabilitation
Medicine

University of Washington

Seattle, WA

Falls and Aging

- Falls are a major problem among older adults
- Falls are not an inevitable part of aging.
- Falls are predictable and often preventable

Prevalence of Falls

- Over 1/3 of community-living adults over 65 years fall each year (Tinetti et al, 1988).
- Prevalence of falls is higher in older adults with chronic health conditions, such as diabetes.
- Falls are the leading cause of injury deaths and the most common cause of injuries and hospital admissions for trauma (Falls Free Summit).
- Older adults are hospitalized for fall-related injuries five times more often than they are for injuries from other causes (Falls Free Summit).

Consequences of falls

- Of those who fall, 20 to 30 percent suffer moderate to severe injuries that reduce mobility and independence, and increase the risk of premature death.
- Only 22% of people who are hospitalized for falls are able to return home (WA State DOH)
- By 2020, the estimated cost for fall injuries for people age 65 and older is expected to reach \$43.8 billion

Individual: Consequences of Falls

- ◆ Psychosocial
 - 20% of fallers express fear of falling
 - Fear lowers self-efficacy for safe walking, and thus increases fall risk
 - Vicious cycle
 - Significantly affects quality of life



Falls result from an interaction between risk factors in the individual and precipitating factors in the environment.



Precipitating Extrinsic Factors

- ◆ Wet, slippery surfaces
- ◆ Uneven, cluttered floors, throw rugs
- ◆ Unexpected obstacles
- ◆ Stairs and curbs
- ◆ Improper or inadequate lighting, or sudden changes in lighting
- ◆ Improper Shoes
- ◆ Pets

Intrinsic risk factors

(Rand report)

Muscle weakness

History of falls

Gait deficit

Balance deficit

Use of walking device

Visual deficit

Arthritis

Impaired ADL

Depression

Cognitive Impairment

Age > 80 years

Relationship between risk factors and falls

Risk of falling

- ◆ 8% in older adults with no risk factors
- ◆ 78% in older adults with 4 or more risk factors

(Tinetti, 2003)

Modifiable Risk Factors

- Muscle Weakness
- Balance Problems
- Walking Problems
- Improper use of cane/walker
- Depression
- Visual problems
- Multiple medications
- Home safety factors

◆ Assessment Recommendations by the American Geriatric Society

- All older adults (65 years and older) should be asked about falls at least once a year
- All older adults who report a single fall should be observed for increased fall risk using Timed Up and Go test,
- Persons with unsteadiness on test require further assessment

Fall Prevention: What can individual clients do?

- ◆ Identify fall risk factors (see My Falls Free Plan)
- ◆ Determine which risk factors are modifiable
- ◆ With primary care doctor, modify as many of these risk factors as possible.
- ◆ The more risk factors that are modified, the more fall risk is reduced.

Fall Prevention: What can individual clients do?

- ◆ 4 steps to reduce risk for falls*
 - Exercise
 - Home safety
 - Vision check
 - Review your medications with your MD
 - Importance of good footwear

* CDC recommendations

The Importance of Exercise

- ◆ An effective intervention for falls prevention
- ◆ Important in maintaining function and preventing disability
- ◆ Essential for prevention and management of chronic disease

Top Risk Factors

- ◆ Muscle Weakness
- ◆ Gait Deficits
- ◆ Balance Deficits
- ◆ Use of Assistive Devices for Gait

Modifiable with exercise!!

Project HomeStretch

The purpose of Project HomeStretch is to help ADS case managed clients diagnosed with diabetes (or other chronic medical conditions) become more active so they can:

- 1) better control their medical conditions,
- 2) improve strength, flexibility, balance, mobility, and CV fitness
- 3) improve functional independence and reduce disability
- 4) improve self-efficacy related to improving health through exercise

HomeStretch History

- ◆ Karen Winston, Aging and Disability Services – grant from CHEF to develop program
- ◆ Contracted with Dept of Rehab Med, UW (Gayle Bouvet and Anne Shumway-Cook) to develop illustrated exercise program “Project HomeStretch”
- ◆ Method for implementation – unresolved
- ◆ UW/ADS collaboration initiated in Spring 2001 (77 clients served)

HomeStretch Implementation

- ◆ Rehab 503: Geriatric Physical Therapy
 - spring, 2nd year, graduate Physical Therapy students
- ◆ Physical Therapy management of the geriatric client (knowledge, skills and attitudes)
- ◆ Issues related to exercise and aging
 - Prescription
 - Precautions
 - Behavior Change and motivation

Project Home Stretch: Procedures

- ◆ Identification of potential client participants, obtain client consent – Janet Epstein

- ◆ MD consent for client participation – Anne SC

- ◆ Homestretch procedures - students
 - Comprehensive Evaluation
 - Individualized Intervention Program - notebook
 - ◆ Exercises: progressive program of home-based exercises including strength, flexibility, CV fitness, balance and mobility training
 - ◆ Education: exercise and health, motivation, lifetime perspective on activity
 - Home visit by PT students, 1x/week for 6 weeks
 - Documentation (initial and DC eval, progress notes) sent to MD and ADS

HomeStretch Medical Precautions

- ◆ Blood Pressure
 - No exercise if diastolic is 110 or above, systolic is 180 or above. Rest or stop if systolic rises above 200 with exercise
- ◆ Glucose
 - < 100 eat before exercising
 - >300 notify MD, get permission to exercise
- ◆ Oxygen levels
 - O₂ sats < 88% notify MD
 - Maintain O₂ sats >90 when exercising

2006 Client Demographics

	HOA* n = 15	ADS n = 15
AGE (mean and range)	79.4 (70-92)	69.2 (57-81)
Gender (% women)	73%	93%
% Living Alone	40%	80%
% Non White	13%	53%
% with Type 2 Diabetes	13%	87%

Volunteers for Rehab 503: Geriatric Physical Therapy

Health and Functional Status

	HOA	ADS
# Prescription Drugs	3 _± 2	10 _± 5
# Comorbidityes	2 _± 1	6 _± 2
BMI (% >30)	22 (0%)	37 (67%)
% using gait device	10%	92%
% reporting falls	20%	80%
ADL Disability (0 – 21)*	0 _± .0	9 _± 6
IADL Disability(0 – 24)	.3 _± .6	12 _± 7

7 items, scored 0 (no difficulty to 3 unable, worst disability = 21)

Baseline Exercise Readiness

	HOA	ADS
PACE (1 – 10)	8 _{±1}	3 _{±1}
Self Efficacy (0 – 28)	26 _{±2}	15 _{±3}
Outcomes Expectation (1-10)	10 _{±0}	8 _{±2}

Baseline Function

Functional Fitness Test	HOA	ADS
Biceps Curl (11-17) (%BNL)	15 \pm 3 (0%)	7 \pm 5 (60%)
Chair Stands (10 – 15) (% BNL)	15 \pm 8 (20%)	2 \pm 2 (100%)
Up and Go (5.2-7.4s) (% BNL)	7.7 \pm 2 (20%)	21 \pm 10 (100%)

6 Week Outcomes

	Pre	Post	# Improved
Biceps Curl	7 \pm 5	11 \pm 6	12/15
Chair Stand	2 \pm 2	5 \pm 3	12/15
Up and Go	21 \pm 10	16 \pm 22	11/15
Self Efficacy	15 \pm 3	20 \pm 8	12/15
Outcomes Expectation	8 \pm 2	9 \pm 3	12/15

Other Outcomes

- ◆ Improved glycemic control in some clients
- ◆ Students – feedback
 - “working with my ADS client was the defining experience of my physical therapy education”
 - “I learned compassion and empathy for the client’s problems”
 - “ I now appreciate how difficult it is for older adults to make behavior changes and exercise”
 - “I learned: listen, don’t make assumptions, be flexible, don’t let the patient give up on herself, and the importance of trust”

Summary of Falls Prevention

- ◆ Falls are not an inevitable part of aging
- ◆ Falls are often predictable and preventable
- ◆ Current best practices
 - Assessment
 - ◆ Talk to your doctor about your fall risk
 - ◆ Assess Risk Factors
 - Intervention
 - ◆ Exercise
 - ◆ Vision
 - ◆ Home Safety
 - ◆ Medication
 - ◆ Footwear

Exercise: A key to improved balance and mobility function and an essential element of falls prevention.