

Education/Environmental Assessment

- Home /Community safety assessment
- Appropriate foot wear
- Checklist inspection by patient/caregiver or professional (home visit prior to discharge, home care services) WITH recommendations for hazard resolution and resources for structural changes.
 - Structural (stairs, doorways, grab bars)
 - Habitual (clutter, obstacles, lighting, electrical cords)

Fear of Falling

Fear of Falling (FOF) is multifactorial in etiology and may be a more pervasive and serious problem than falls in older adults.¹⁹

Risk factors identified for the development of FOF:

- Fair or poor perceived general health
- Feeling unsteady
- Having 2 or more falls³⁷

A fear of falling can be considered a "red flag" for the need to conduct a falls risk assessment.

Selected Readings

American Geriatric Society: Guidelines for the Prevention of Falls in Older Adults (2001), www.americangeriatrics.org/products/positionpapers/Falls.pdf

National Council on Aging, Center for Healthy Aging, Falls Free Coalition, healthyagingprograms.org/content.asp?sectionid=113

Centers for Disease Control and Prevention, Falls Among Older Adults: An Overview, www.cdc.gov/ncipc/factsheets/adultfalls.htm

A complete list of citations and additional information are available at www.apta.org/pfsp.

This document is not intended for use as a patient/client handout.



Section On
Geriatrics



NEUROLOGY
SECTION

Physical Fitness and Falls Risk Reduction

Section on Geriatrics and Neurology Section of the American Physical Therapy Association in partnership with the American Physical Therapy Association



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**Falls Risk Reduction
In Older Adults**

Physical Fitness and Falls Risk Reduction Based on Best Available Evidence

Falls Risk Reduction and Promotion of Physical Fitness

Fall: An unexpected event in which the participants come to rest on the ground, floor, or lower level.¹

Falls are a major health concern among older adults. More than one third of older adults fall each year and fall rates increase with advancing age.² Falls are the leading cause of injury deaths, the most common cause of non-fatal injuries, and the most common reason for hospital admission due to trauma in older adults.³ Every hour, there is one death and 183 emergency department visits for falls-related injuries among older adults.⁴ More than 95% of hip fractures are caused by falls.⁴

APTA's initiative, Physical Fitness for Special Populations, focuses on the role of physical therapy in addressing physical fitness needs of individual populations, including those at risk for falls.

Risk Factors for Falling⁶

Research shows that a cumulative effect of multiple interacting factors increases fall risk in any one individual.

Muscle weakness	Arthritis
History of falls	Impaired ADLs
Gait deficit	Depression
Balance deficit	Cognitive impairment
Use of assistive device	Age > 80 years
Visual deficit(s)	Medications*
Neurologic deficits#	Cardiovascular deficits^

*Greater than 4 meds, psychotropic or antiarrhythmic meds, digoxin, or diuretics

#Such as deficits affecting mental status, lower extremity peripheral nerves, proprioception, reflexes, and extrapyramidal and cerebellar function

^Such as deficits affecting heart rate and rhythm (bradycardia), abnormal blood pressure and pulse responses to postural changes, and carotid sinus syndrome

Tests and Measures

Physical therapists can use a number of tests and measures to determine a patient's/client's risk of falling. Listed below are some commonly used examinations/tools. It is important to match the correct tool(s) with the correct patient/client and setting to aptly measure falls risk. This may require using more than one tool to take into account the multiple factors that may contribute to the patient's/client's falls risk.

Within the examination, include tests that focus on **range of motion, muscle strength, and sensory integrity**. Foot and ankle deficits in tactile sensitivity, ankle flexibility, and toe strength are important factors in balance and functional ability in older adults.⁷ Weakness around the knee and ankle relate to increased incidence of falls.⁸

Balance and Gait

Berg Balance Scale⁹:

14-item scale designed to measure balance. Predicts multiple falls in community dwelling and institutionalized older adults.¹⁰ Score of < 45: older adults at risk of falling.¹¹

Timed Up and Go Test¹²:

Used to screen individuals prone to falls; requires the client to be able to follow directions. Score of 13.5 seconds: Fall risk in older adults.¹³

Tinetti Performance Oriented Mobility Assessment: Balance Test, Gait Test¹⁴:

Task-oriented test that measures gait and balance abilities. A combined mobility score of less than 19/28 was significantly predictive of multiple falls in the high-risk group.¹⁵

Dynamic Gait Index¹⁶:

To assess the ability to modify gait to changes in task demands in the older adult at risk for falling.⁵ Score of ≤ 19 : predictive of falls in older adults.¹⁷

Falls Efficacy Scale (FES)¹⁸:

To assess confidence in the older adult in performing daily activities without falling. Appropriate for older adults who are homebound and have low mobility.¹⁹ The higher the score, the lower the falls self-efficacy (confidence).

Activities-specific Balance Confidence Scale²⁰:

16-item scale designed to detect loss of balance confidence for older adults with higher functioning. Requires that the patient/client be able to follow directions. Score of $\geq 80\%$ is indicative of high functioning, usually physically active older adults; 50% – 80% is indicative of a moderate level of physical functioning; $\leq 50\%$ is indicative of low level physical functioning.²¹ $< 67\%$ classifies older adults at risk of falling; predictive of future fall.¹¹

Other Applicable Tests and Measures:

Functional Reach,²² Multi-directional Reach,²³ Physical Performance Test,²⁴ Romberg,²⁵ Four Square Step Test (FSST),²⁶ and stance tests that include eyes open, eyes closed, semi-tandem, tandem, and standing on one leg.

Interventions to Reduce the Risk of Falling With Physical Activity

Benefits of Physical Activity and Exercise: Reduce fear of falling, improve cardiovascular health and functional reserve, decrease depression, and reduce sleep disorders.²⁷

A multifactorial approach: Based on the results of the examination, interventions that address more than one risk factor or identified cause of falls (eg, environmental hazards, medications, mobility, vision, cardiovascular disorders)²⁸ have the greatest benefit.

Successful Exercise Program Characteristics²⁷

- Has sufficient intensity to improve muscle strength.
- Is regular and sustainable (long-term intervention/participation).
- Includes dynamic balance training activities (eg, Tai Chi techniques).
- May be performed at a center/clinic or home; group or individual.
- Is simple, easily instituted and low cost.

Exercises^{27,29,30,31,32,33,34}

- Concentrate on strengthening LEs, especially the ankle, and trunk/core muscles affecting motor control.
- Reduce joint pain/instability.
- Correct postural faults.

Exercise is effective in reducing falls in the spectrum of people who range from relatively fit and well and community dwelling to cognitively intact people living in residential care facilities.³⁵

Balance Retraining

Target the neuromuscular systems that control balance through various levels of challenge.

- Begin with controlling the center of gravity (COG) over the base of support (BOS).
- Progress by challenging the regulation of balance and postural stability specifically engaging visual, vestibular, somatosensory and cognitive systems.
- Elicit postural reactions and ankle, hip and step strategies by altering stimuli, surfaces, secondary tasks to mimic functional activities, resistance, direction and velocity of movement.
- Consider Tai Chi.³⁶ An eastern exercise form that has been simplified and adapted to emphasize balance, weight shifting, coordination, and postural training with significant benefits to many populations at risk for falls.

Gait Training

Include all the components of gait in addition to:

- Appropriate and accurately adjusted assistive devices, and
- Challenge and advance with changes in surfaces/terrain, elevations, time/rhythm, distance, physical load, attention, postural transition (start, stop, direction), and amount of support.

References

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