

Improving Slip- and Trip-Resisting Skills in Older Clients

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2021 IDEA FITNESS LEADER OF THE YEAR

Types of Falls

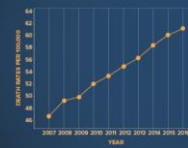


Fall Statistics



Fall Death Rates in the U.S.

INCREASED 30%
FROM 2007 TO 2016 FOR OLDER ADULTS



If rates continue to rise,
we can anticipate
7 FALL DEATHS
EVERY HOUR
BY 2030

Learn more at www.cdc.gov/HomeandRecreationSafety

Slips, Trips, and Falls at Home

75% Falls in the Home

Environmental Factors



55%

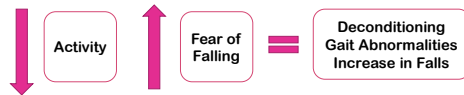
Additional Risk Factors for Falls

Age	Tranquilizers, sedatives, CV meds, antidepressants
Gender	Taking four or more RX medications
History or fear of falling	Vision Impairments
Sedentary behavior	Vestibular Impairments
Lower body weakness	Cognitive impairment
Gait abnormalities	Postural hypotension
Mobility limitations	Depression

Who Falls the Most?



Post Fall Anxiety Syndrome



Fall Risk Questionnaire

Check Your Risk for Falling		What it means
Yes (Y)	No (N)	
Have you ever fallen in the past year?		People who have fallen once or more in the past year are at a higher risk of falling again.
Do you have any medical conditions that might increase your risk of falling?		Some medical conditions, such as heart disease, stroke, or diabetes, can increase your risk of falling.
Do you take any medications that might increase your risk of falling?		Some medications, such as sedatives, tranquilizers, or blood thinners, can increase your risk of falling.
Do you have any vision problems?		People with vision problems, such as cataracts or glaucoma, are at a higher risk of falling.
Do you have any hearing problems?		People with hearing problems are at a higher risk of falling because they may not hear warnings or instructions.
Do you have any balance problems?		People with balance problems are at a higher risk of falling.
Do you have any leg or foot problems?		People with leg or foot problems, such as arthritis or neuropathy, are at a higher risk of falling.
Do you have any muscle weakness or stiffness?		People with muscle weakness or stiffness are at a higher risk of falling.
Do you have any dizziness or lightheadedness?		People with dizziness or lightheadedness are at a higher risk of falling.
Do you have any problems with your stairs or steps?		People with problems with their stairs or steps are at a higher risk of falling.
Do you have any problems with your walking surface?		People with problems with their walking surface are at a higher risk of falling.
Do you have any problems with your footwear?		People with problems with their footwear are at a higher risk of falling.
Do you have any problems with your walking speed?		People with problems with their walking speed are at a higher risk of falling.
Do you have any problems with your walking direction?		People with problems with their walking direction are at a higher risk of falling.
Do you have any problems with your walking posture?		People with problems with their walking posture are at a higher risk of falling.
Do you have any problems with your walking endurance?		People with problems with their walking endurance are at a higher risk of falling.
Do you have any problems with your walking confidence?		People with problems with their walking confidence are at a higher risk of falling.
Do you have any problems with your walking safety?		People with problems with their walking safety are at a higher risk of falling.
Do you have any problems with your walking health?		People with problems with their walking health are at a higher risk of falling.
Do you have any problems with your walking happiness?		People with problems with their walking happiness are at a higher risk of falling.
Do you have any problems with your walking peace of mind?		People with problems with their walking peace of mind are at a higher risk of falling.
Do you have any problems with your walking quality of life?		People with problems with their walking quality of life are at a higher risk of falling.
Do you have any problems with your walking satisfaction?		People with problems with their walking satisfaction are at a higher risk of falling.
Do you have any problems with your walking well-being?		People with problems with their walking well-being are at a higher risk of falling.
Do you have any problems with your walking overall?		People with problems with their walking overall are at a higher risk of falling.

<https://www.cdc.gov/steadi/pdf/STEADI-Brochure-StayIndependent-508.pdf>

Risk Reduction Strategies

Strength
ROM
Balance
Gait

Frequency
Intensity
Duration
Overload
Progression
Specificity

Static vs Dynamic Stability

STATIC

Ability to control postural sway - quiet standing/sitting

DYNAMIC

maintenance of postural stability while the body is in motion

Definition: Slips



To slide unintentionally

Definition: Trips



To catch the foot against something so as to stumble

Slips and Trips

Direction-Related Specificity
Disturbance-Related Specificity



Direction – Related Specificity

General direction of the fall



Disturbance-Related Specificity

Cause of the loss of dynamic stability

Backward Slip

Trunk Extension

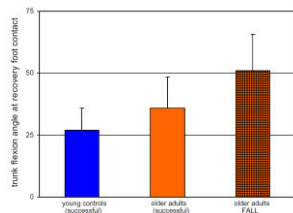
Backward Trip

Key Factor in Falls

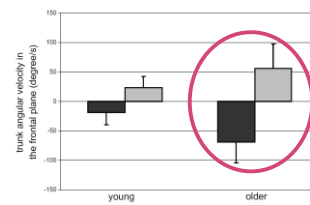
The ability to limit undesirable kinematics of the mass of HAT



Trunk Flexion After A Trip

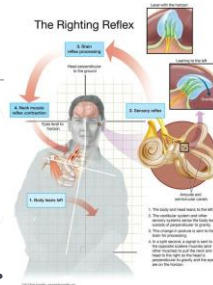


Trunk Angle Velocity



Righting Reflex

Corrects the orientation of the body



Insufficient Righting Reflex

Velocity and Flexion

Walking velocity of older adults who recovered < younger adults

Walking velocity of older adults who fell = younger adults

Smaller and/or delayed trunk extension moment generation

Exercises to Prevent Slips and Trips

Traditional Balance Programs

Whole-body, task-specific training
based on fall-specific information

Quick Review

Goal: limit undesirable kinematics of the mass of HAT

Falls are **dynamic**, very rarely static

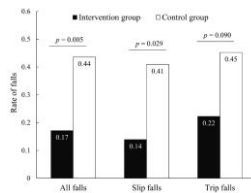
Trunk Flexion Angle

Trunk Angle Velocity

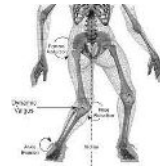
Direction-Related Specificity

Disturbance-Related Specificity

Specificity of Training



Tradition is Important!



POWER!



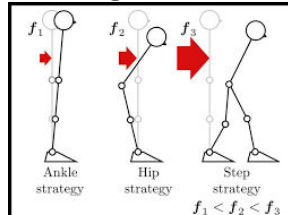
Task-Specific Training

Practice context-specific motor skills

Control forward rotation

Control backward rotation

Strategies for Balance Recovery



Ankle Strategies

Wobble Board – Toe Taps

Ankle Strategies

Wall Drops

Hip Strategies

Hula Hooping

Hip Strategies

TRX Hip Extension/Flexion

Hip Strategies

Wall Offs

Step Strategies

Multi-Directional Lunges

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Step Strategies

Leg Swings

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Step Strategies

Quick Steps

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Reach and Grab Strategies

Ball Toss

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Take - Aways

Generalized Balance Program

Specificity for Training

Control Forward Rotation

Control Backward Rotation

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Suggested Readings

Grabiner, M.D. et al. (2008). Trunk Kinematics and Fall Risk of Older Adults: Translating Biomechanical Results to the Clinic. *Journal of Electromyography and Kinesiology*, 18, 197-204.

Grabiner, M.D. et al. (2014). Exercise-Based Fall Prevention: Can You Be A Bit More Specific?. *Exercise and Sport Science Review*. 42(4), 161-168.

Karamanidis, K. et al. (2020). Improving Trip- and Slip-Resisting Skills in older People: Perturbation Dose Matters. *Exercise and Sport Sciences Review*, 48(1), 40-47.