Improving Slip- and Trip-Resisting Skills in Older Clients

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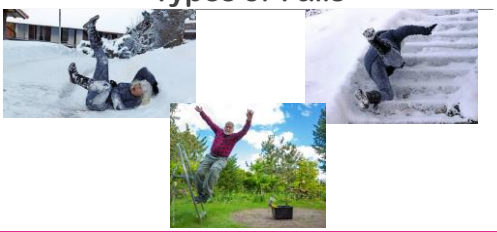
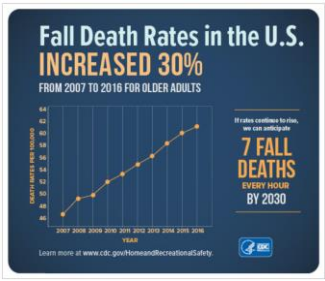
2021 IDEA FITNESS LEADER OF THE YEAR

Types of Falls



Fall Statistics



Slips, Trips, and Falls at Home

75% Falls in the Home

Environmental Factors

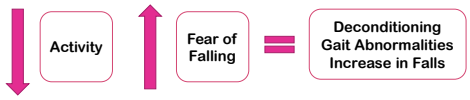
55%

Additional Risk Factors for Falls

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

Who Falls the Most?

Post Fall Anxiety Syndrome



Fall Risk Questionnaire

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

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Definition: Slips

To slide unintentionally

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Definition: Trips

To catch the foot against something so as to stumble

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Slips and Trips

Direction-Related Specificity

Disturbance-Related Specificity

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Direction – Related Specificity

General direction of the fall

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Disturbance-Related Specificity

Cause of the loss of dynamic stability

Backward Slip

Trunk Extension

Backward Trip

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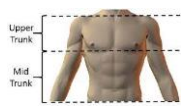
Key Factor in Falls

The ability to limit undesirable kinematics of the mass of HAT



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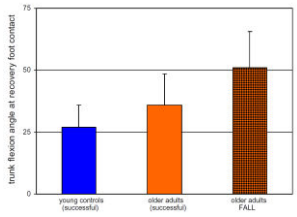
Trunk Flexion After A Trip



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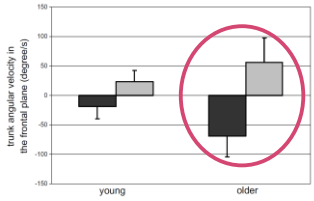
Trunk Angle Velocity



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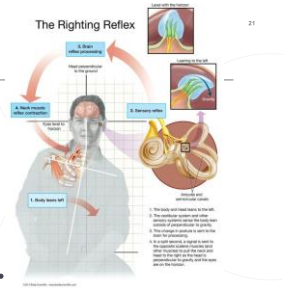
Righting Reflex

Corrects the orientation of the body



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Insufficient Righting Reflex

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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

Pavol, M.J. et al. (2001. Mechanisms Leading to a Fall From an Induced Trip in Healthy Older Adults, *The Journals of Gerontology: Series A*, 56(7), M428–M437.

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Exercises to Prevent Slips and Trips

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Traditional Balance Programs

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

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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

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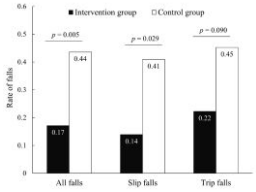
Specificity of Training



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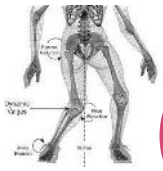
Tradition is Important!



POWER!

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Task-Specific Training

Practice context-specific motor skills

Control forward rotation

Control backward rotation

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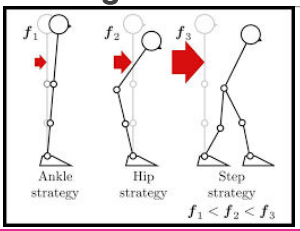
Strategies for Balance Recovery



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Ankle Strategies

Wobble Board – Toe Taps

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Ankle Strategies

Wall Drops

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Hip Strategies

Hula Hooping

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Hip Strategies

TRX Hip Extension/Flexion

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Hip Strategies

Wall Offs

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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.