



Telehealth for Falls and Fracture  
Prevention Implementation Trial

A/Professor David Scott has a conversation with

**PROF. ROBIN DALY**

Chair of Exercise and Ageing, Institute for Physical  
Activity and Nutrition, Deakin University

Educational Module



**Exercise for Improving  
Function and Preventing Falls**



# Risk Factors for Falls

## Key Intrinsic Risk Factors

Adapted from the American Geriatrics Society.  
J Am Geriatric Soc, 49:664-672, 2001

1. *Muscle weakness*
2. *History of falls*
3. *Gait deficit*
4. *Balance deficit*
5. Assistive device use
6. Visual deficit
7. Arthritis
8. Impaired ADL
9. Depression
10. Cognitive Impairment
11. Executive functions
12. Age >80 years



Falls Risk



# Risk Factors for Falls

## Key Intrinsic Risk Factors

1. Muscle weakness
2. History of falls
3. Gait deficit
4. Balance deficit
5. Assistive device use
6. Visual deficit
7. Arthritis
8. Impaired ADL
9. Depression
10. Cognitive Impairment
11. Executive functions
12. Age >80 years



Falls Risk

Adapted from the American Geriatrics Society.  
J Am Geriatric Soc, 49:664-672, 2001

# Stop Walking When Talking!

- **Dual tasking** is associated with an increased falls risk (e.g., walking with a cup of hot tea).
- Under dual-task situations, older adults and those with a history of falls have:
  - Poorer reaction times
  - Reduced walking speed
  - Increased sway
  - More frequent contact with obstacles
  - Slower step velocities



# Frequent Cause(s) of Falls in Older Adults



## Community-dwelling Older Adults

### Common activities associated with falls:

- Walking (61%), at home (61%) & during day (88%)
- Displacement from quiet position (13%)
- Gardening (9%) & getting out of bed/chair (5%)

### The most frequent cause of falling:

- Lost balance (32%)
- Slipped on an uneven/slippery surface (29%)
- Tripped over obstacle (27%)
- High risk activity (9%)



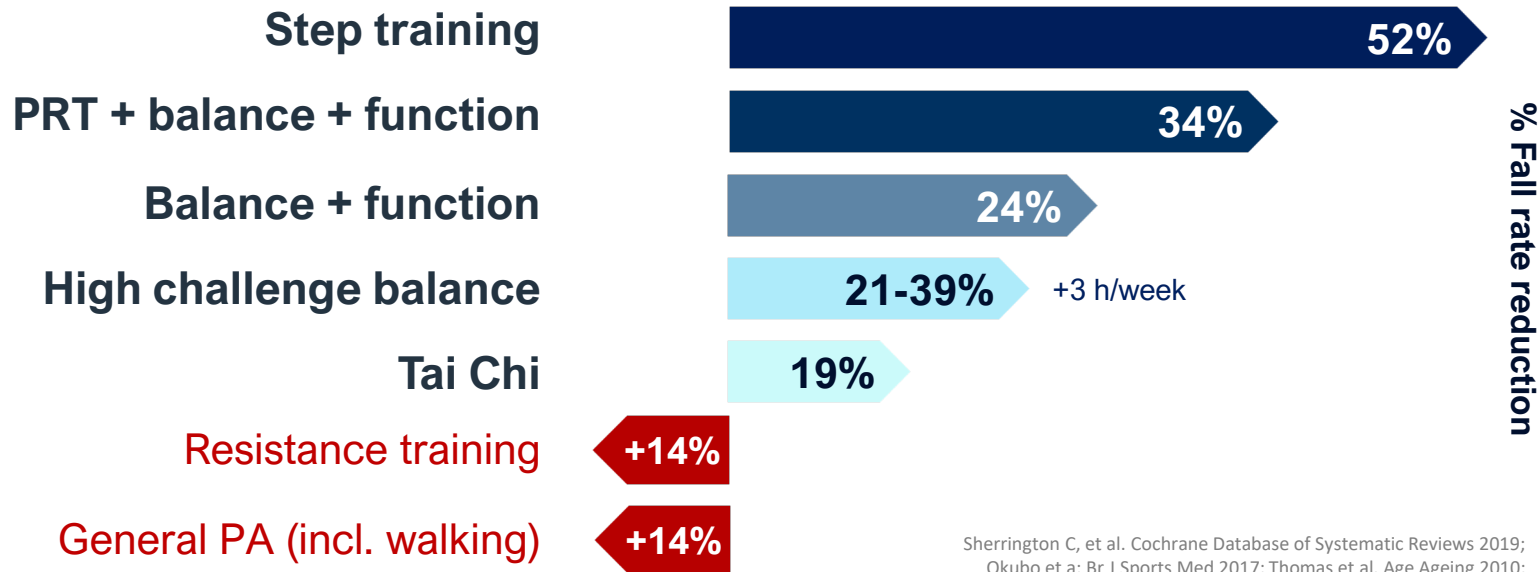
Video from Yang et al. *J Bone Miner Res* 2020 Oct;35(10):1914-1922



Real-life videos from residents in long-term care: Robinovitch et al. *Lancet* 381(9860): 47-54, 2013

# Exercise for Falls Prevention

Percentage reduction in the rate of fall by the type of exercise



Sherrington C, et al. Cochrane Database of Systematic Reviews 2019; Okubo et al. Br J Sports Med 2017; Thomas et al. Age Ageing 2010; Sherrington et al. Br J Sports Med 2017

PRT, progressive resistance training



Make Exercises Meaningful



Courtesy of Dustin Jones, PT, DPT, GSC, CF-L1

<https://www.facebook.com/dustinjones.dpt/videos/make-it-meaningful/330467218527524/>



# Functional

## *Exercise Snacking*

A **31% reduction** in falls incidence after 12 months of performing the LiFE program

Clemson et al. BMJ 2012;345:e4547



Turn everyday activities into an opportunity to improve your balance & strength and prevent falls (47% adherence after 6 months)



<http://www.cec.health.nsw.gov.au/programs/falls-prevention/april-falls-day-2013>

# Challenging Balance Training



You need to take one or more steps to keep your balance during exercise



You need to move your arms or grab and hold something to keep your balance during exercise



You feel unsteady during the exercise



You feel yourself holding any part of your body stiff or rigid to keep your balance during exercise

**20:20 balance guide** to monitor your balance intensity. This balance principle suggests the individual need to feel 20% steady AND 20% unsteady when training balance.

# *Train to Improve* **Movement Speed**

- ✓ **High-velocity (power) training:** perform the lifting phase as rapidly or quickly as possible.
- ✓ **Greater benefits** to physical function with power training compared to normal slow speed resistance training.
- ✓ **Similar gains** in muscle strength and mass compared to traditional training.

Steib et al. Med Sci Sports Exerc. 2010; 42:902-14; Glenn JM et al Age Ageing 1-6, 2015; Reid et al. J Geront A Biol Sci Med Sci 2015

