

FALL RESILIENCE VS. FALL PREVENTION: WHAT IS OUR GOAL?

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5
6
ProVision
ATD
Notice of Additional Screening
STOP
Your safety is our priority
cpc
100 YEARS



TSA = A system built to support itself and manage stresses along multiple points of a timeline



What would 100% effective strategy be for TSA to PREVENT all bad things from happening?







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AGE ON
THE GYM FOR 55+

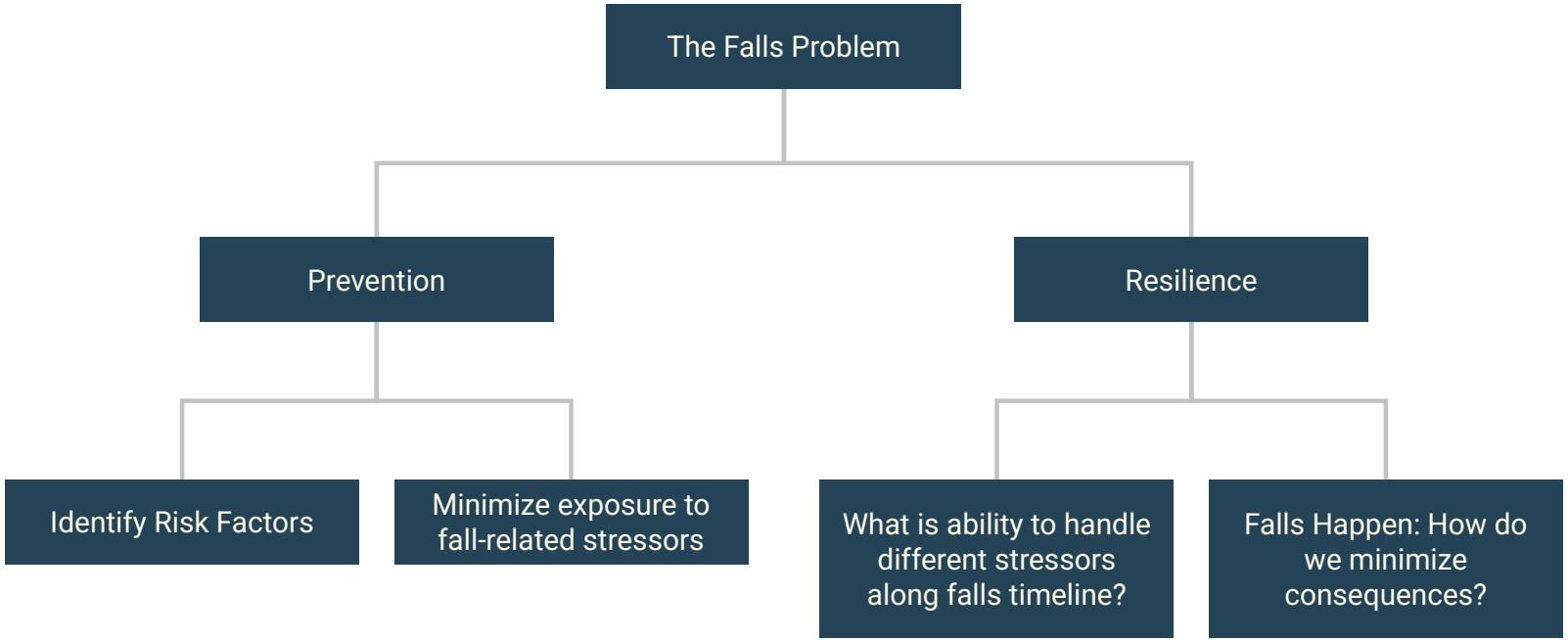
Objectives

1) Describe “reactive balance” and the implications of this skill for reducing fall risk.

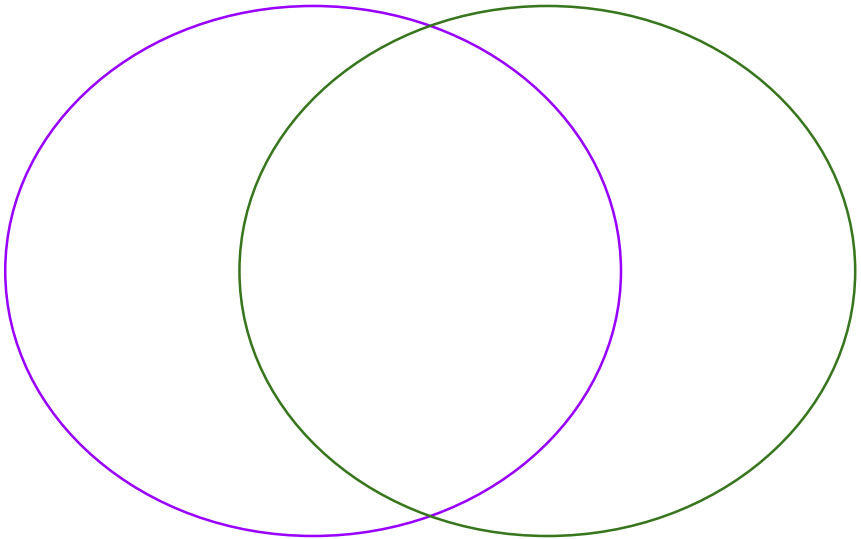
2) Appreciate that fall mechanics and fall landing strategies are skills that can be taught, learned, and retained.

3) Understand why fear of falling can relate to fall risk and self selected reductions in physical activity.

Falls resilience framework: advancing from risk reduction to resilience building in older adults (Ravi, 2026)



Reality



This Conversation



Balance Bill:

- 81 yo male; DM, HTN, knee replacement

- Admissions 6 mo ago d/t fall with loss of consciousness w/o brain bleed or other injury
- Lives with his wife in home with stairs
- Bill and family concerned about falling and wife's ability to help



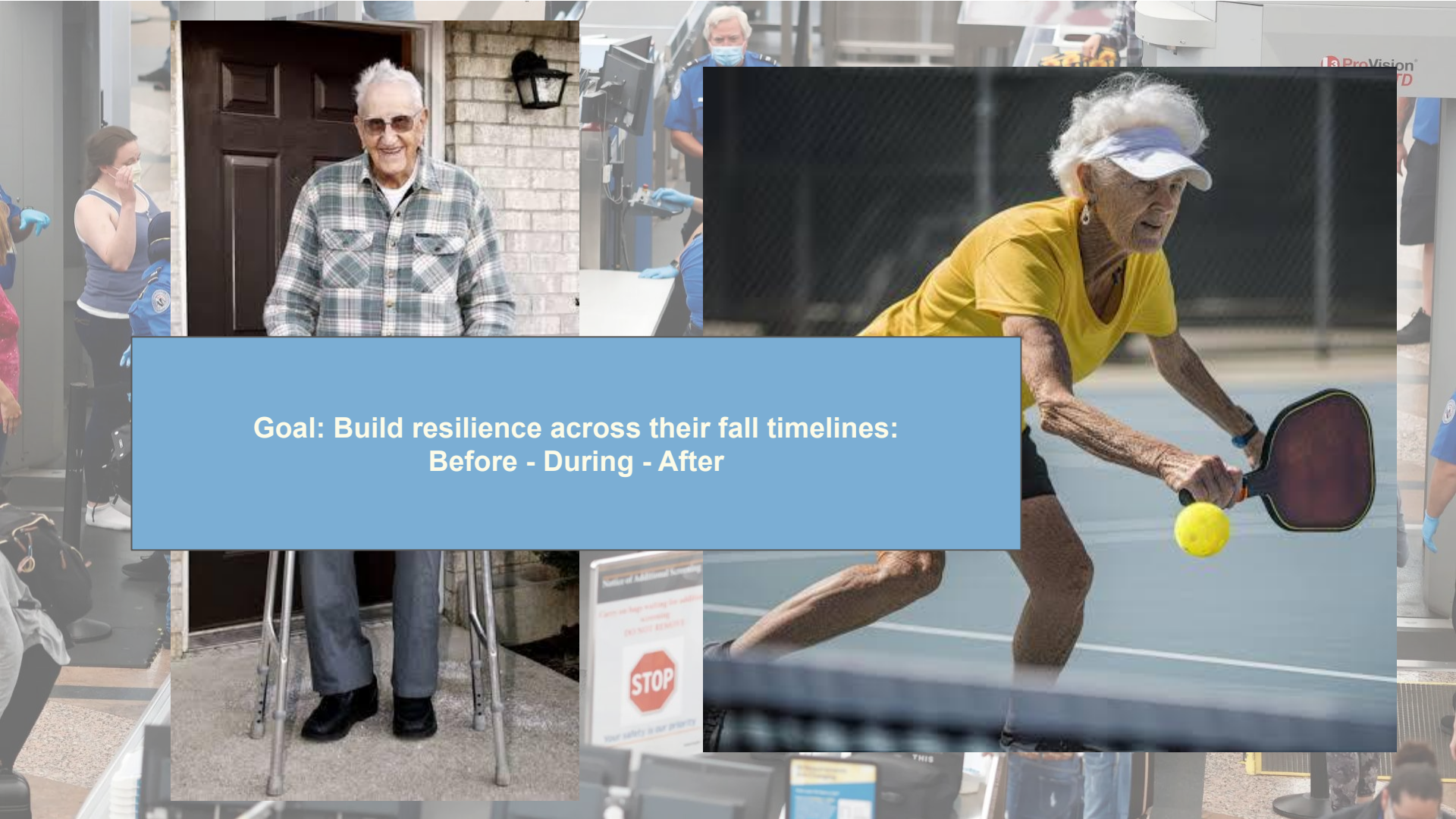
Pickle Pat:



- 74 yo female

- T-Score Lumbar spine = -2.6
- T-Score Femoral neck = -1.2

- Fall while playing > distal radius fracture
- Eager to return to the court


Goal: Build resilience across their fall timelines:
Before - During - After
STOP









Fall timeline: BEFORE

Before (the next fall)

Why have previous falls happened?

Environment review

- Prevent: Remove rugs, physical assistance on stairs and for transitions, lift chair in living room/steps
- Resilience: What are gaps in ability to move laterally to avoid rugs, complete higher steps, manage a destabilizing event

Assistive device recommendations

- Prevent: USE THIS DEVICE
- Resilience: Why does device help, what are gaps in ability that require its use

Balance + Strength training

- Prevent: seated exercise, steady state + anticipatory balance training within abilities
- Resilience: anticipatory + reactive balance training nearing capacity of abilities



Before (the next fall)

What demands of game contribute to falls?

Activity recommendations

- Prevent: “you lose your balance too much”, “you’ll probably fall again” > “play less”, “go easier”, “don’t be so competitive”

- Resilience: “you lose your balance too much”, “you’ll probably fall again” > reactive balance/agility training that simulate demands of sport

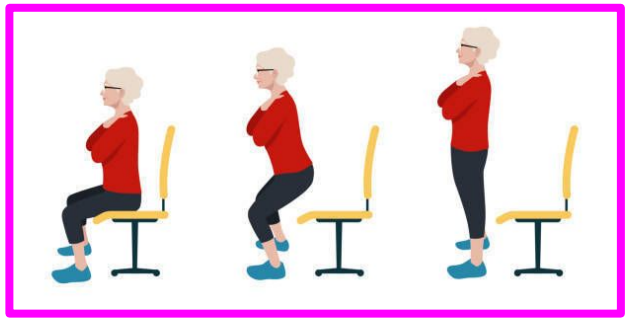


Steady State Postural Control





Anticipatory Postural Control













Steady State Postural Control

Anticipatory Postural Control

GOAL
PREVENT destabilizing event
KEEP balance





Steady State Postural Control

Anticipatory Postural Control

GOAL
PREVENT destabilizing event
KEEP balance





We know they're exposed to risk

Likely will experience destabilizing event

GOAL
Manage demands/stress of destabilizing event

Reactive Balance





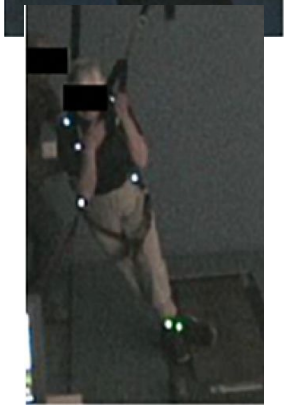
Ability to respond to sensory input that signals a need for a response to ensure successful maintenance of postural control.

The need for a response is unanticipated but may be generated externally (perturbation originating external to body) or secondarily to an internally generated movement.

This includes the ability to adapt motor behavior to meet the demands of different task and environmental conditions. (Gill-Body, 2021)

How is Reactive Balance different in fallers vs. non-fallers? (Batcir, 2024)





- 59 Women
- Unannounced Perturbations

49 w/o fall
Avg age = 78.71

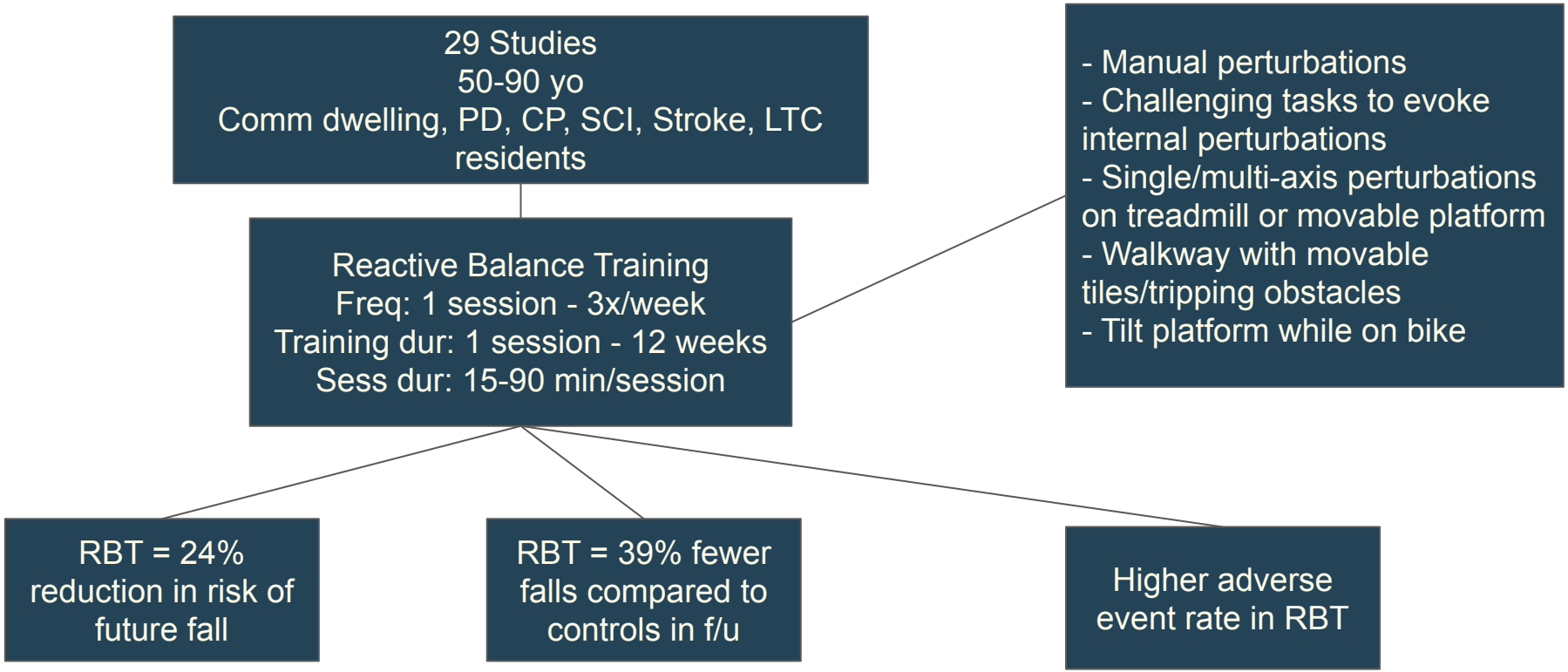
10 with fall
Avg age = 79.35

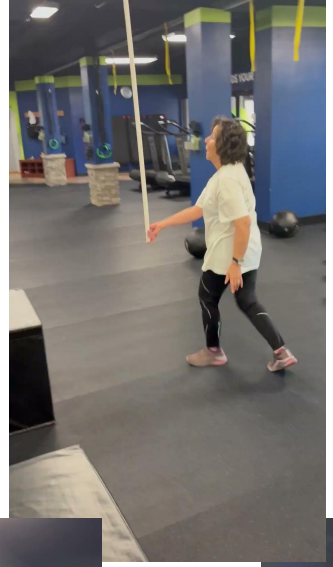
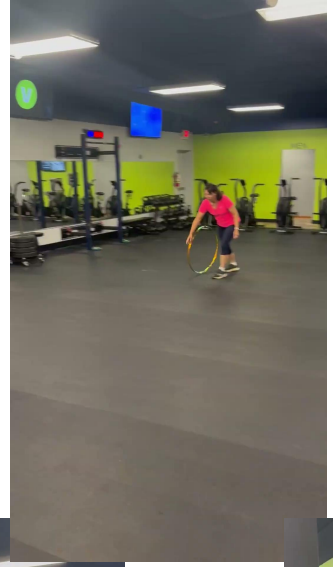
Baseline Info:
Fallers
- Sig more falls in previous year
- Sig worse Falls Efficacy Scale

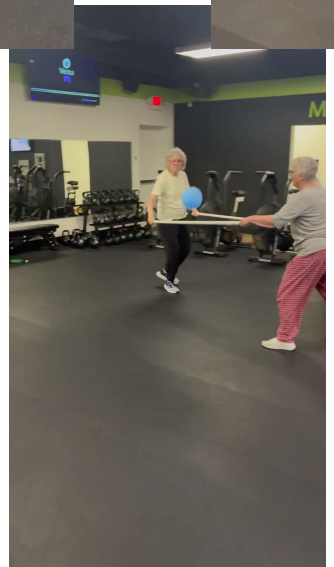
Compared to NF:
- Longer time to initiate step once perturbation applied
- Longer time first step was in air
- Longer time to peak foot velocity
- Longer ground > ground time
- Larger COM displacement

Their fall trial v. non-fall trial:
- Swing phase longer
- Longer ground > ground time
- Longer time to peak foot velocity
- Larger COM displacement during fall

Training implications of Reactive Balance (Devasahayam, 2022)





GET REAL RESULTS


Fall timeline: DURING
STOP

Can We Learn How to Fall? (Zanotto, 2025)

WHO:
- >65
- At risk of injurious fall
- Tscore > -2.3
- <10 sec 1 leg stance
- No exercisers
- No previous fractures

TRAINING (2x/wk - 4 wks):

- FAST = Progressed fall landing practice (12)
- Otago (12)

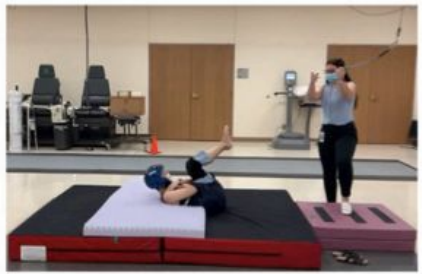
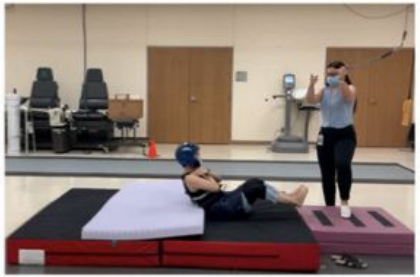
Assessments:
Baseline - 4 wk - 3 mo

RESULTS:

- FAST = sig greater reduction in head acceleration @ 4 wk + 3 mo compared to Otago

- FAST = Sig reduction in hip velocity from BL > 4wk > 3 mo



Can We Learn How to Fall? (Arkkukangas, 2022)

WHO:
- Avg Age 72
- Independent walkers



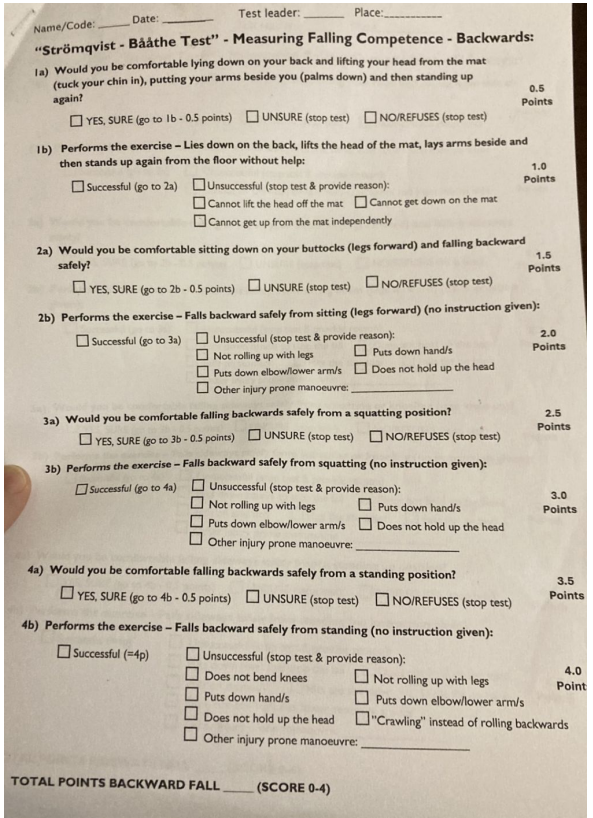
TRAINING:
1hr/week - 12 weeks

- Falls techniques, strength training, power training

RESULTS:

- Significant improvements in backward, forward, sideways falling techniques

- “No adverse effects of intervention observed”



Name/Code: _____ Date: _____ Test leader: _____ Place: _____

“Strömqvist - Båathe Test” - Measuring Falling Competence - Backwards:

1a) Would you be comfortable lying down on your back and lifting your head from the mat (tuck your chin in), putting your arms beside you (palms down) and then standing up again? 0.5 Points

☐ YES, SURE (go to 1b - 0.5 points) ☐ UNSURE (stop test) ☐ NO/REFUSES (stop test)

1b) Performs the exercise – Lies down on the back, lifts the head of the mat, lays arms beside and then stands up again from the floor without help: 1.0 Points

☐ Successful (go to 2a) ☐ Unsuccessful (stop test & provide reason):
☐ Cannot lift the head off the mat ☐ Cannot get down on the mat
☐ Cannot get up from the mat independently

2a) Would you be comfortable sitting down on your buttocks (legs forward) and falling backward safely? 1.5 Points

☐ YES, SURE (go to 2b - 0.5 points) ☐ UNSURE (stop test) ☐ NO/REFUSES (stop test)

2b) Performs the exercise – Falls backward safely from sitting (legs forward) (no instruction given): 2.0 Points

☐ Successful (go to 3a) ☐ Unsuccessful (stop test & provide reason):
☐ Not rolling up with legs ☐ Puts down hand/s
☐ Puts down elbow/lower arm/s ☐ Does not hold up the head
☐ Other injury prone manoeuvre: _____

3a) Would you be comfortable falling backwards safely from a squatting position? 2.5 Points

☐ YES, SURE (go to 3b - 0.5 points) ☐ UNSURE (stop test) ☐ NO/REFUSES (stop test)

3b) *Performs the exercise – Falls backward safely from squatting (no instruction given):* 3.0 Points

☐ *Successful (go to 4a)* ☐ Unsuccessful (stop test & provide reason):
☐ Not rolling up with legs ☐ Puts down hand/s
☐ Puts down elbow/lower arm/s ☐ Does not hold up the head
☐ Other injury prone manoeuvre: _____

4a) Would you be comfortable falling backwards safely from a standing position? 3.5 Points

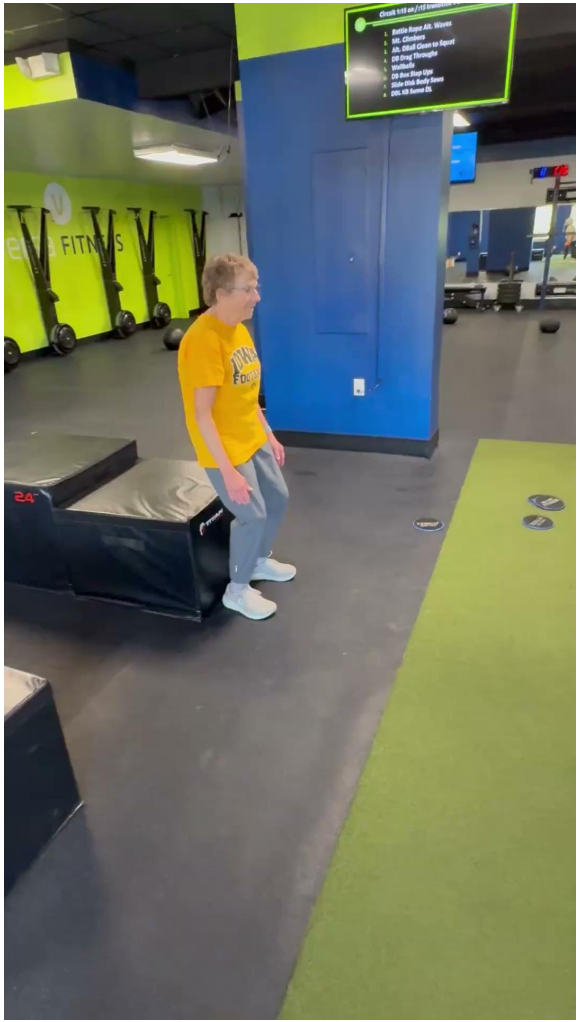
☐ YES, SURE (go to 4b - 0.5 points) ☐ UNSURE (stop test) ☐ NO/REFUSES (stop test)

4b) Performs the exercise – Falls backward safely from standing (no instruction given): 4.0 Point

☐ Successful (=4p) ☐ Unsuccessful (stop test & provide reason):
☐ Does not bend knees ☐ Not rolling up with legs
☐ Puts down hand/s ☐ Puts down elbow/lower arm/s
☐ Does not hold up the head ☐ “Crawling” instead of rolling backwards
☐ Other injury prone manoeuvre: _____

TOTAL POINTS BACKWARD FALL ____ (SCORE 0-4)

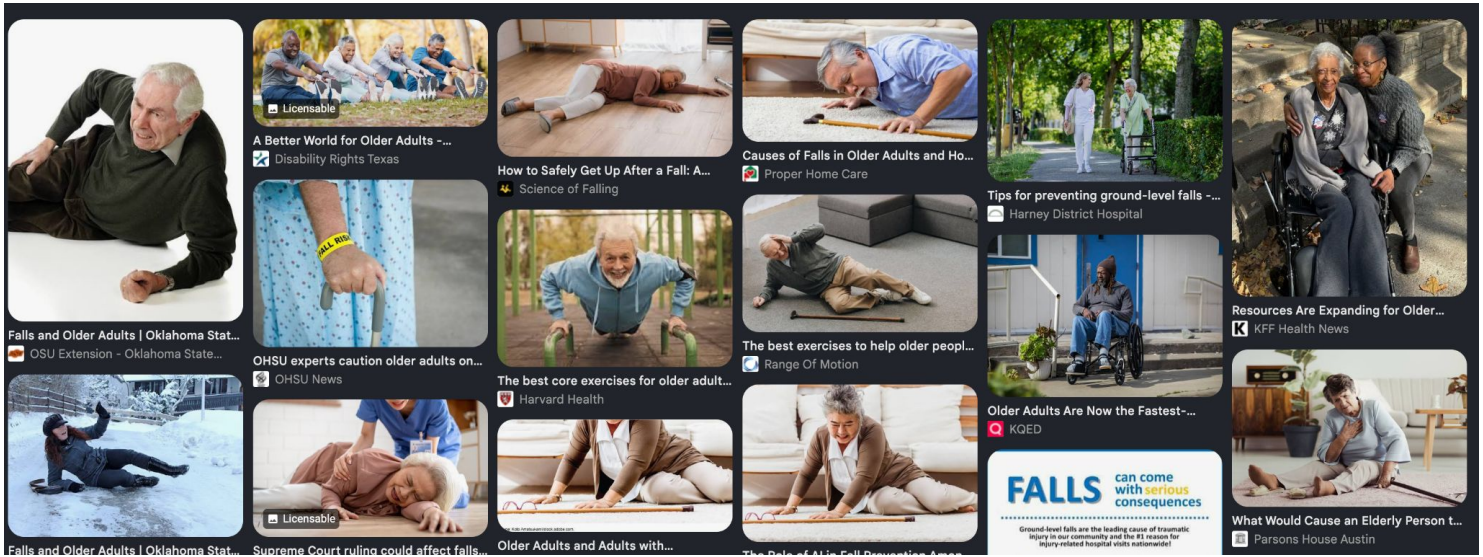

ROGUE
TITAN
20"


FITNESS
TITAN
24"


HEROES
LIFE
20"

Is the Ground a Place of Fear or Ownership?

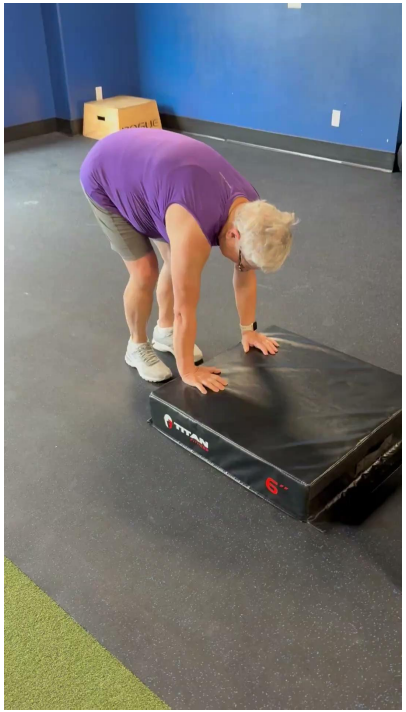
- Supine > Stand performance significantly correlates with gait speed, grip strength, TUG performance (Klima, 2016).
- Different elevation strategies (sit-up, side-sit, roll-over) require different demands (Stutzenberger, 2025), (Burton, 2023).



Is the Ground a Place of Fear or Ownership?







- How would you get up if you fell in XYZ room?

- What in XYZ room could you put your hands on if you needed to get up?

- How would you direct someone to assist you if on ground?

- How many different ways can you get up from the ground?

- How many different ways can you move from A>B on the ground?









Fall timeline: AFTER

Who’s Fearful of Falling? (Xiong, 2024)

- 70+ yo = 4x more likely to develop FoF
- High FoF prevalence in hx of hip fx, knee OA, DM, osteoporosis
- 80% of those with fall history report FoF





What Changes with FoF?

- More FoF significantly correlated with
  - Shorter step length
  - Shorter stride length
  - Longer stance phase duration
  - Slower gait speed
  - Decreased cadence
  - (Brachman, 2025), (Drummond, 2022)

- Lower gait variability





Preventative Focused Framework

“Falls are really bad and can have massive implications from the level of the person to the level of the the entire health care system.”

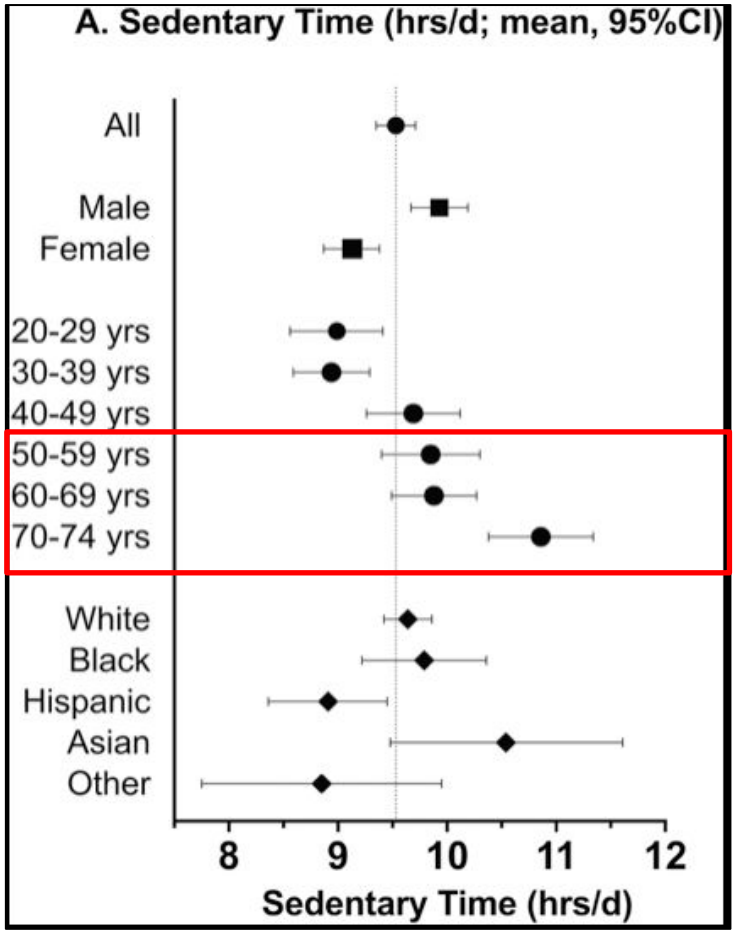
“More is to be lost when a fall occurs than to be gained by participating in activities involving risk.”

Resilience Focused Framework

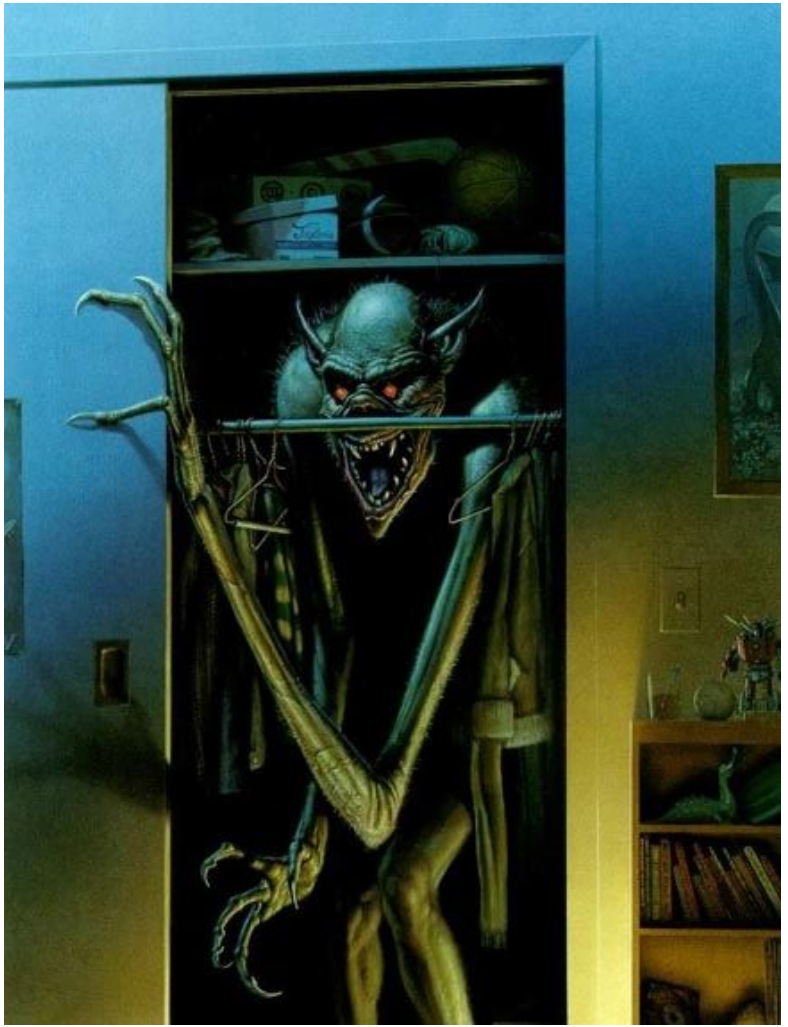
“Falls are really bad and can have massive implications from the level of the person to the level of the the entire health care system.”

“What are the biggest physical, emotional, environmental stressors contributing to your risk?”

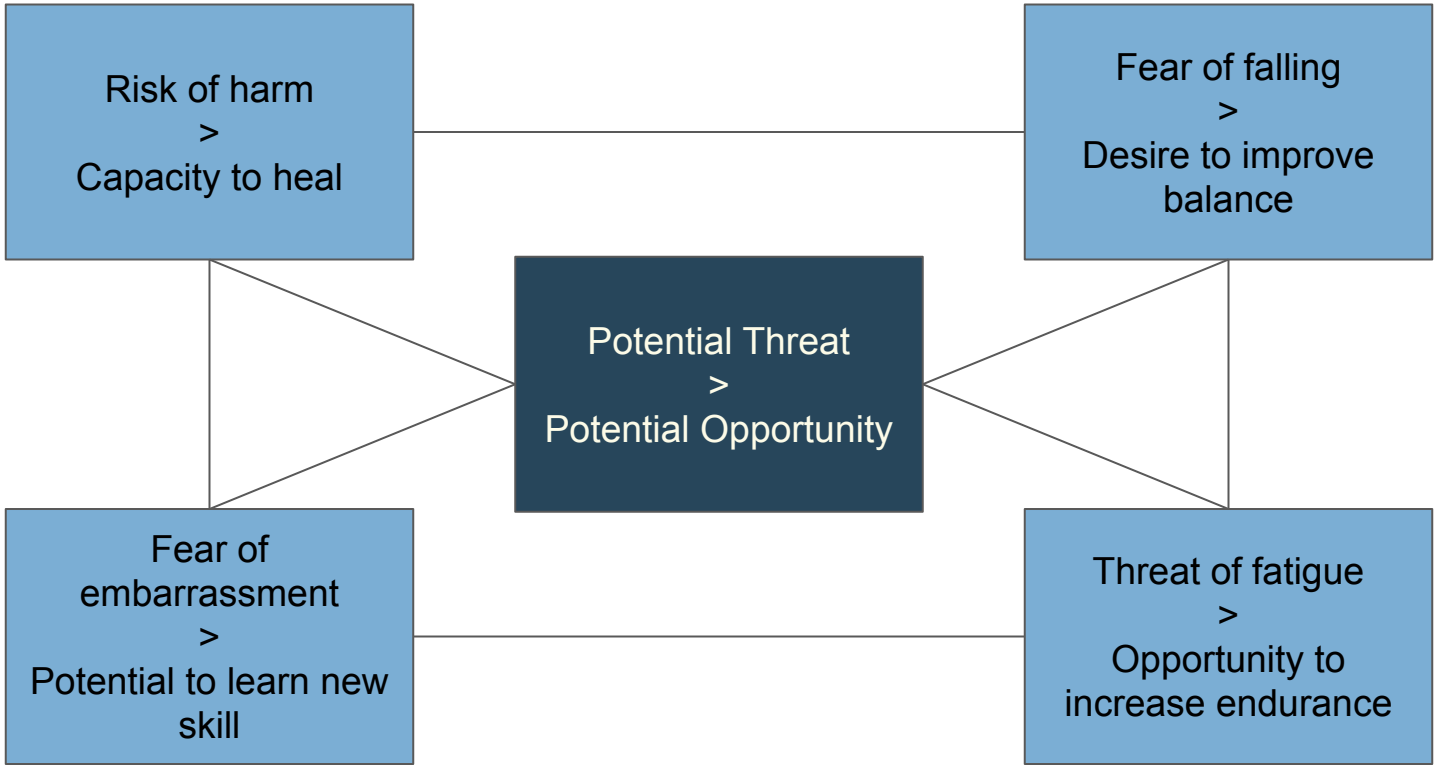
“Can you withstand or overcome that risk? What support do you need to build your capacity to handle these stressors?”



(Matthews, 2019)



Older Adults Beliefs + Barriers to Movement (Meredith, 2023)



Preventative Focused Conversation

Resilience Focused Conversation

“Your FRAX shows 11% chance of major OP fracture and 2.8% of hip fx within 10 years”

“Is pickleball worth the risk? Don’t you have some friends who play bridge?”

“You’re pretty independent in your day/day life. You probably don’t need any balance training”



“Your FRAX shows 11% chance of major OP fracture and 2.8% of hip fx within 10 years”

“What parts of your game do you feel most unsteady? What’s your barrier to moving up a level”

“Falls happen a lot in pickleball. What are you doing to support continuing to play at a high level?”

Preventative Focused Conversation

Resilience Focused Conversation

“Please use the walker, Dad. I don’t want you to end up in the hospital again.”

“Just keep standing on one leg as long as you can.”

“I don’t think your wife feels good about having to help you up off ground”



“Your walker is keeping you safe for now. Would you want to work on things that might help you need it less?”

“We need to do thing that challenge your balance and make you move faster when you’re feeling unsteady”

“How confident do you feel getting up off ground? How often do you do this voluntary?”

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