Falls

Katie Drago, MD, FACP

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Disclosures

- I have no financial relationships beyond my OHSU salary
- No connections to industry or any of the research presented today

Learning Objectives

Reframe falls as a preventable source of injury among older adults

Adopt evidence based screening tools for identifying and addressing individual risk factors

Advocate for the importance of the nurse's role in fall risk assessment and prevention

Myth: Falls are a normal part of getting older

Multifactorial & Preventable

- Cluster randomized trial of 301 older adults with at least 1 risk factor for falls found that:

- Falls are preventable → **31%** reduction with multicomponent falls prevention intervention
- Nobody falls for just one reason
  - Assess for common risk factors in everyone to craft individual falls risk profiles

Tinetti et al. NEJM 1994

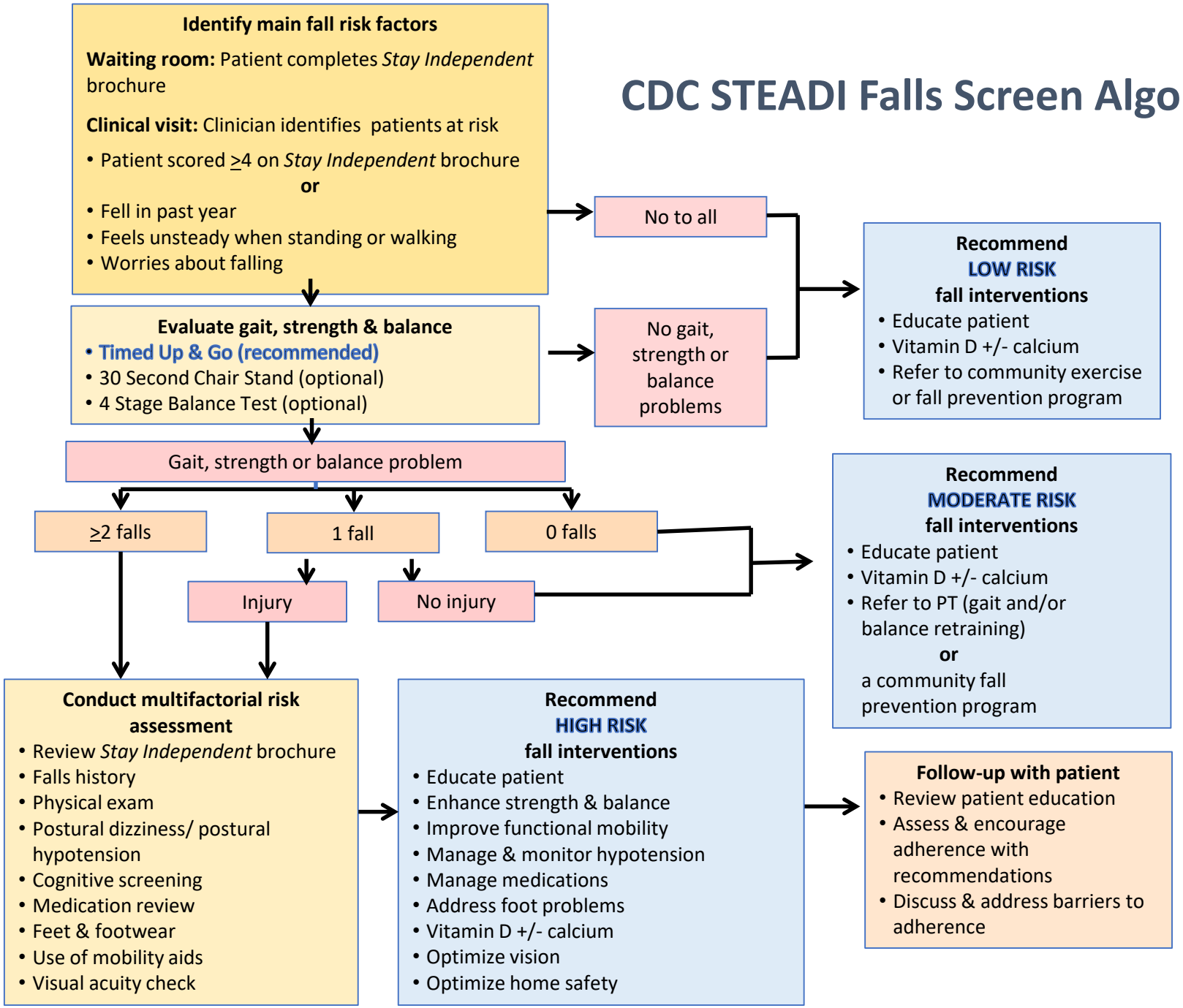
Risk Factors for Falls

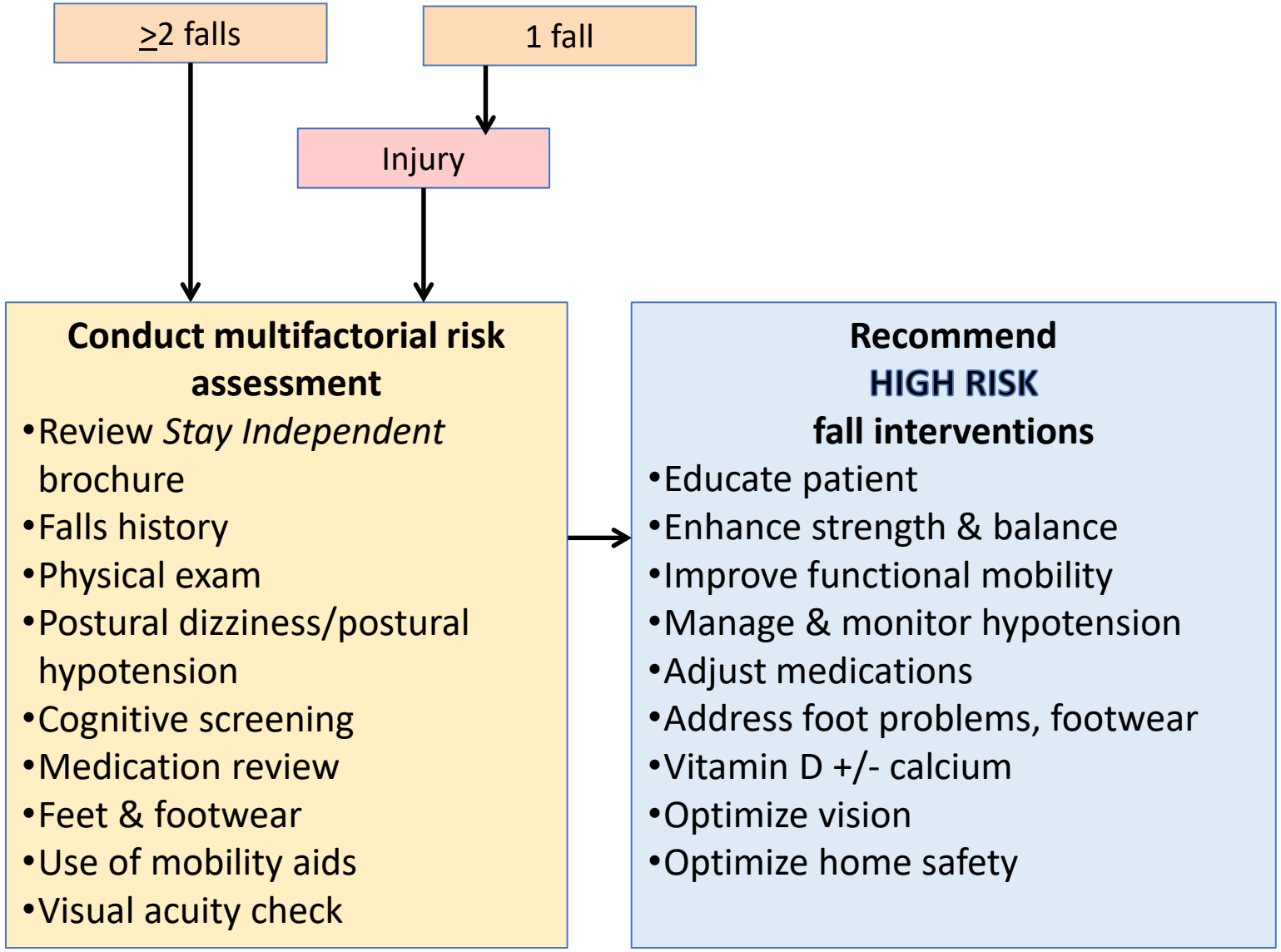
Risk Factor	Mean RR or OR
Muscle weakness	4.4
History of falls	3.0
Abnormal Gait	2.9
Balance impairment	2.9
Use of assistive device	2.6
Arthritis	2.4
Impaired ADLs	2.3
Depression	2.2
Cognitive Impairment	1.8
Age > 80 years	1.7
Visual deficit	1.5
Medications	Varies

Rate of Falls	Risk Factor
50%	Long Term Care
60%	Pts who fell in the last year

AGS/BGS, 2001

CDC STEADI Falls Screen Algorithm




≥2 falls
1 fall
Injury
Conduct multifactorial risk assessment
•Review *Stay Independent* brochure
•Falls history
•Physical exam
•Postural dizziness/postural hypotension
•Cognitive screening
•Medication review
•Feet & footwear
•Use of mobility aids
•Visual acuity check
Recommend
HIGH RISK
fall interventions
•Educate patient
•Enhance strength & balance
•Improve functional mobility
•Manage & monitor hypotension
•Adjust medications
•Address foot problems, footwear
•Vitamin D +/- calcium
•Optimize vision
•Optimize home safety

Gait/Strength/Balance

- Ask about functional status, balance, walking & transferring
  - Weakness & poor balance are not normal parts of aging!

- <u>Testing Gait, Strength & Balance</u>:
  - Timed Up & Go (TUG)
  - 30 Second Sit to Stands
  - 4 Stage Balance Test
  - Tinetti Gait & Balance
- Gait & balance training → **~20%** reduction in fall risk

Frick, et al. J Amer Geriatr Soc 2010

Gait/Strength/Balance

Hypothyroidism & B12 Deficiency

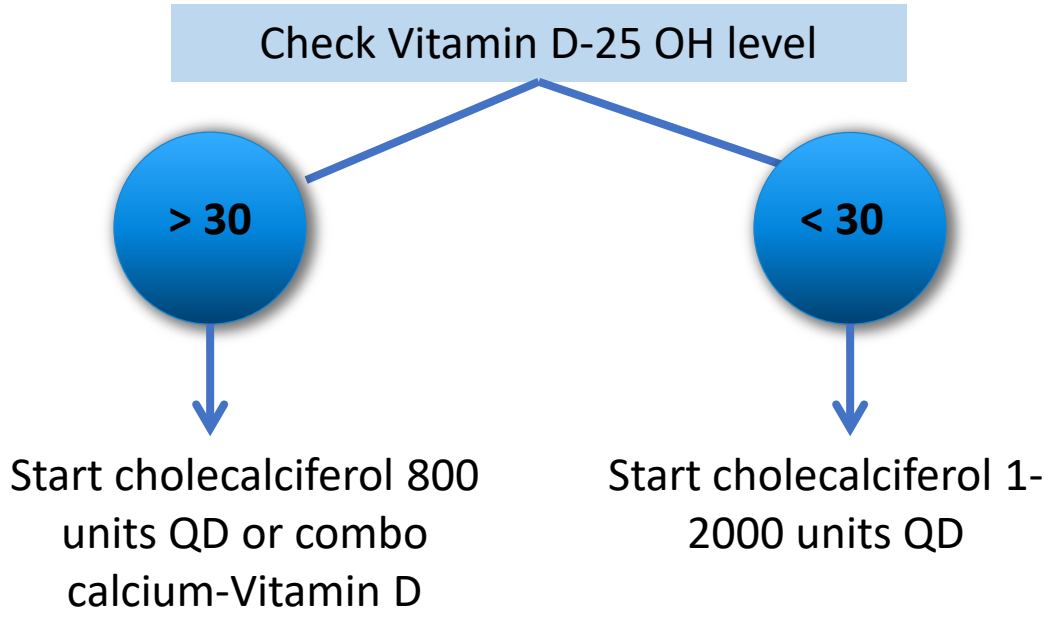
- Common, often overlooked
  - Vague symptoms, easily attributable to other chronic conditions

- Hypothyroidism → fatigue, muscle weakness, cognitive impairment & poor safety awareness
- B12 Deficiency → neuropathy, impaired balance

Younge, J. BMJ 2016
Rubenstein, L. Age & Ageing 2006

Vitamin D Deficiency

- Vitamin D quickly increases muscle strength through calcium transport & protein synthesis
- In people with deficiency, ~26% fall reduction can be observed within months (NNT = **15**)



Bischoff-Ferrari et al. JAMA Int Med. 2004

Vitamin D

Emerging data that suggests routine supplementation in an average risk population doesn’t reduce fall risk

Trauma populations are inherently high risk!

Tai Chi

RCT of 256 older Portland residents found that regular tai chi:

- Reduces fall risk by ~55%
- Reduces injurious falls (**NNT 9**)
- Reduces fear of falling

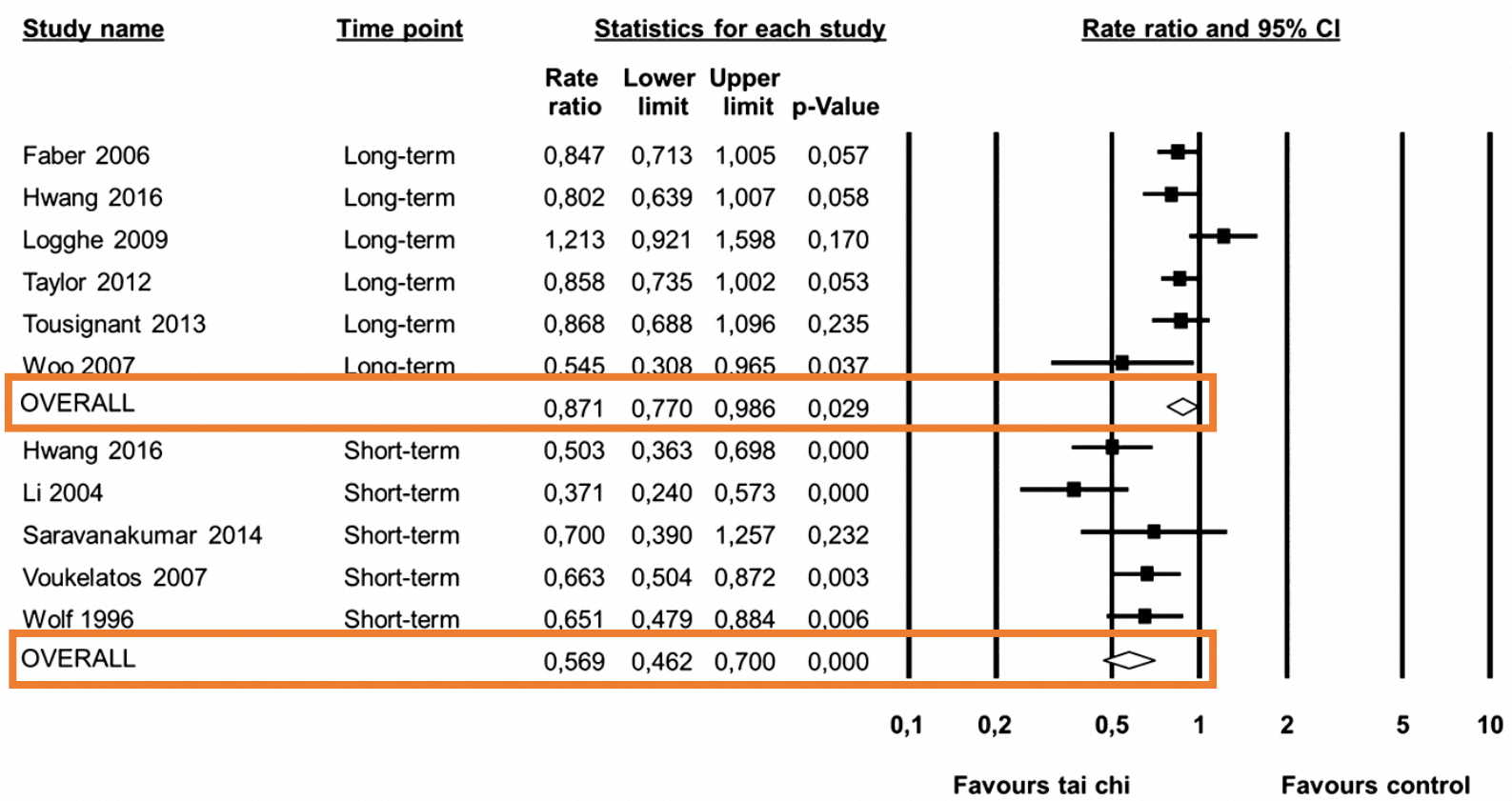
Goal 1 hour three times a week

Li et al. J Gerontol A Biol Sci Med Sci 2005

Tai Chi

2017 meta analysis of 10 RCTs

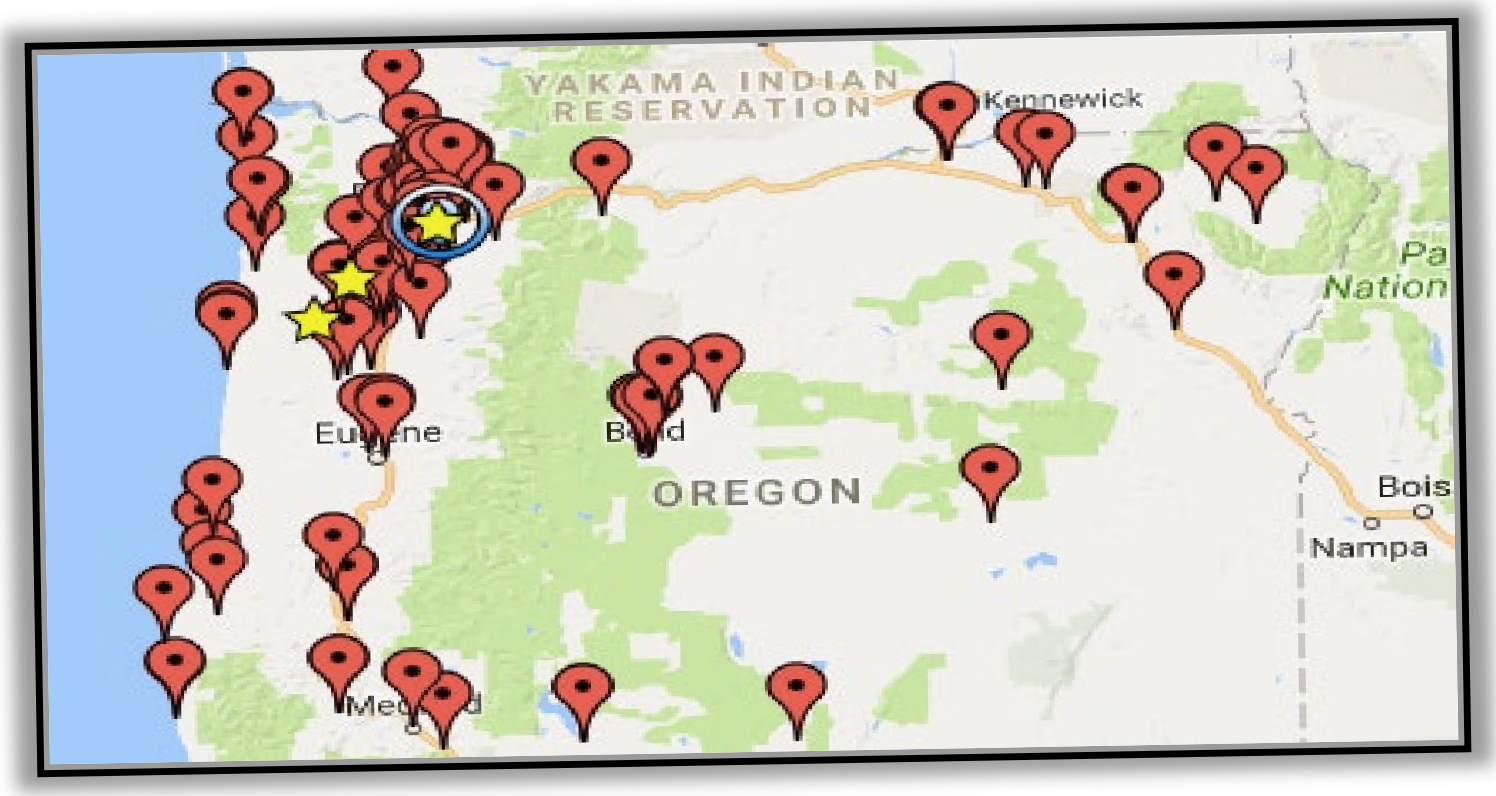
43% and **50%** reductions in falls and injurious falls at 12 months



Study name	Time point	Rate ratio	Lower limit	Upper limit	p-Value
Faber 2006	Long-term	0,847	0,713	1,005	0,057
Hwang 2016	Long-term	0,802	0,639	1,007	0,058
Logghe 2009	Long-term	1,213	0,921	1,598	0,170
Taylor 2012	Long-term	0,858	0,735	1,002	0,053
Tousignant 2013	Long-term	0,868	0,688	1,096	0,235
Woo 2007	Long-term	0,545	0,308	0,965	0,037
OVERALL		0,871	0,770	0,986	0,029
Hwang 2016	Short-term	0,503	0,363	0,698	0,000
Li 2004	Short-term	0,371	0,240	0,573	0,000
Saravanakumar 2014	Short-term	0,700	0,390	1,257	0,232
Voukelatos 2007	Short-term	0,663	0,504	0,872	0,003
Wolf 1996	Short-term	0,651	0,479	0,884	0,006
OVERALL		0,569	0,462	0,700	0,000

Figure 1. Forest plot for fall incidence (effect sizes are expressed as incidence rate ratio). Short-term follow-up indicates less than 12 months; long-term follow-up indicates equal to or greater than 12 months.

Lomas-Vega, et al. J Am Geriatr Soc. 2017



Tai Chi: Moving for Better Balance

https://public.health.oregon.gov/PreventionWellness/SafeLiving/FallPrevention/Pages/TaiChi.aspx

Home Safety

- No throw rugs, mats, long cords
- Mark uneven surfaces
- LESS CLUTTER
- Chairs, toilet at right height
- Nightlights, grab bars, handrails
- Even, non-glare lighting

- Involving PT, OT, RNs in home safety modifications:
  - Cost effective
  - Reduces fall risk by **~34%**

Frick et al. J Amer Geriatr Soc 2010

Orthostatic Hypotension

- Affects 18% of adults over 65

- Of those with OH (symptomatic or not):
  - HR (community dwelling) = **2.5**

- No association between falls and hypertension (controlled or uncontrolled) without orthostasis

Ooi et al. Am J Med. 2000
Gangavati et al. J Amer Geriatr Soc. 2011

Footwear & Fall Risk

Prospective 2-year study of independent elders (327 fallers compared to 327 controls) found:

Footwear *matters …*

- Safest shoes = **athletic & canvas shoes**

  (other types increased falls by **70%**)

- Going barefoot dramatically increased falls 10-fold (**1000%**)

Koepsell, *J Amer Geriatr Soc,* 2004

Bifocals vs Single Focus Lenses

RCT of 606 older multifocal wearers who had fallen in past year or had Timed Up and Go>15 seconds found:

- Falls were prevented by **getting rid of bifocals and progressive lenses** for those community ambulators (**NNT 2**)

- If patients less active or homebound, single lenses increased falls

Haran, *BMJ,* 2010

Inpatient/ED Falls Workup

- <u>Details of Fall Event</u>
  - Setting, prodromal symptoms
  - Teasing out medical complications
- <u>Focused Exam</u>
  - Orthostatic VS
  - Brief Snellen chart*
  - Timed Up & Go (TUG), 30 second sit to stands, 4 Stage Balance Test*
  - LE Sensation, proprioception
  - Muscle bulk, signs of malnutrition & physical frailty
- Medication review & reduction plan for high risk agents
- Physical and Occupational Therapy consults
  - Specify falls history
  - In house activity plan, appropriate assistive devices
- TSH, B12, Vitamin D-25OH levels
  - Results within last year okay

Falls History

of falls or near falls this year: ***
Brief description of events: ***
Prior Injuries: ***
Using assistive devices: {YES***/NO:60::"yes - ***"}

Falls Specific ROS:
Positional Lightheadedness: {YES***/NO:60::"yes - ***"}
Visual Impairment: {YES***/NO:60::"yes - ***"}
Neuropathy: {YES***/NO:60::"yes - ***"}
Balance Impairment: {YES***/NO:60::"yes - ***"}
Chronic Pain: {YES***/NO:60::"yes - ***"}
Depression: {YES***/NO:60::"yes - ***"}
Med Changes: {YES***/NO:60::"yes - ***"}
PO Fluids: ***
Footwear: ***

Makes it easier to clearly document falls contributors in A/P

Myth: Falls are a symptom of ”UTI”

Falls and “UTI”

- Falls are not a reliable symptom of UTI
- Routine testing without clinical context → detection of asymptomatic bacteriuria → inappropriate antibiotic treatment

- 2019 IDSA Guidelines on Asymptomatic Bacteriuria
  - Recommend against UA in the workup of falls without any focal urinary tract symptoms
  - Testing should be reserved for those with a compelling history for UTI

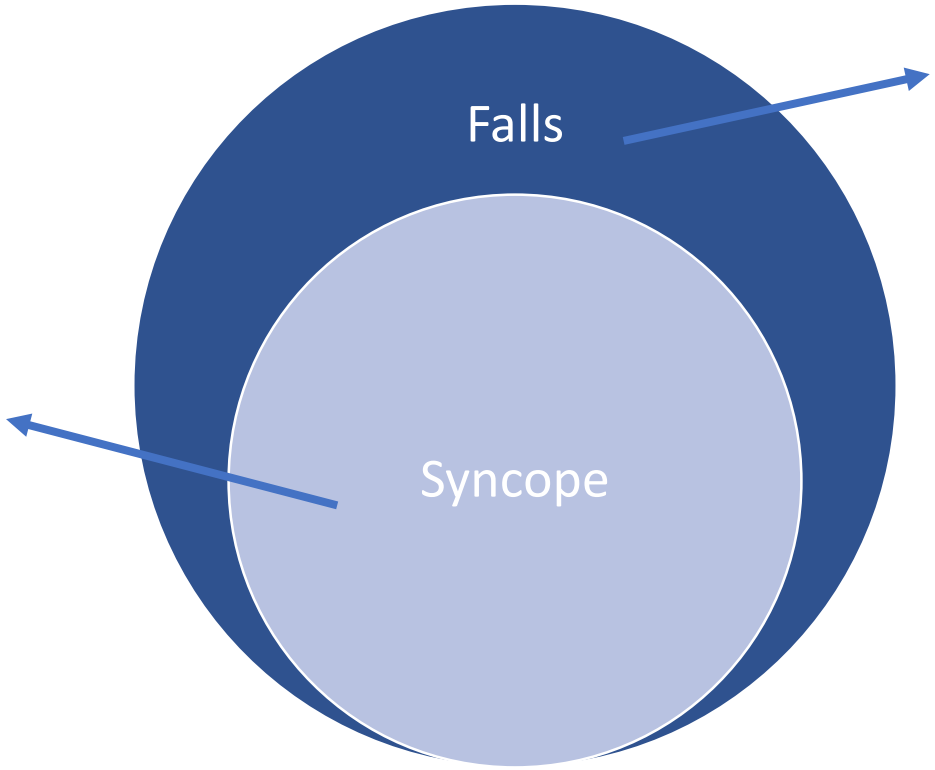
Nicolle LE, et al. *Clinical Infectious Diseases*, ciy1121, https://doi.org/10.1093/cid/ciy1121

Myth: All falls are syncope

The Relationship Between Falls & Syncope

Transient, global loss of cerebral perfusion resulting in temporary loss of consciousness

Falling may be protective



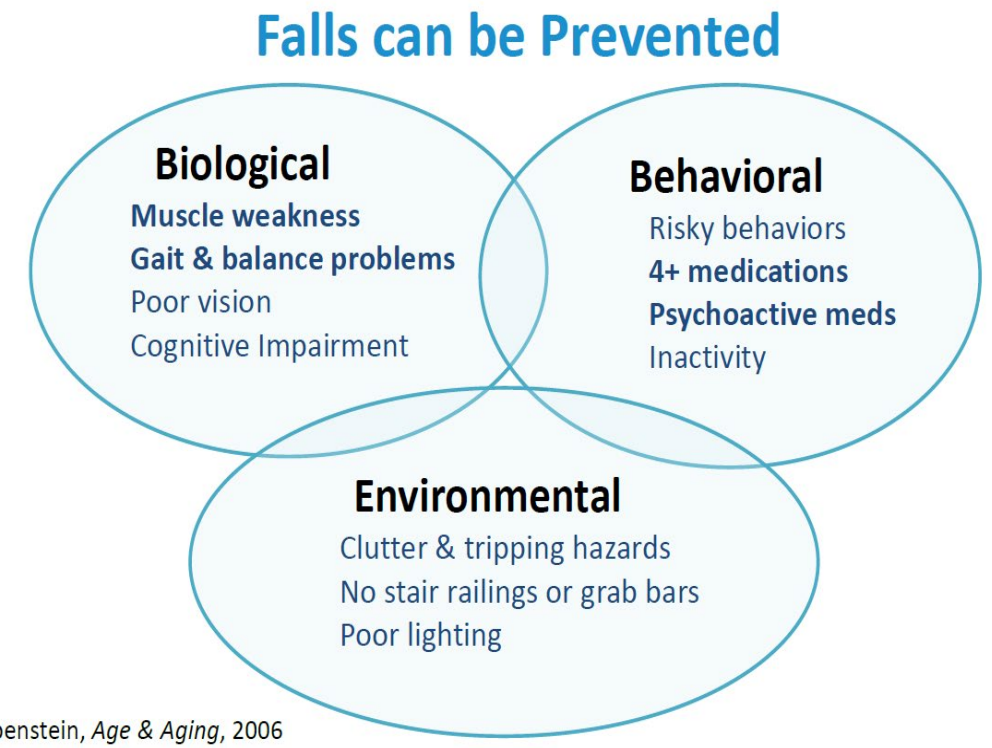
Unintentionally coming to rest on a lower surface/level

Fall vs Syncope

Details of the event are important because the differential for falls & syncope are different

- Setting: time of day, surroundings, location, pets, shoes?, assistive devices?
- Prodromal symptoms
- Actions leading to the fall: turning, standing, sitting, reaching

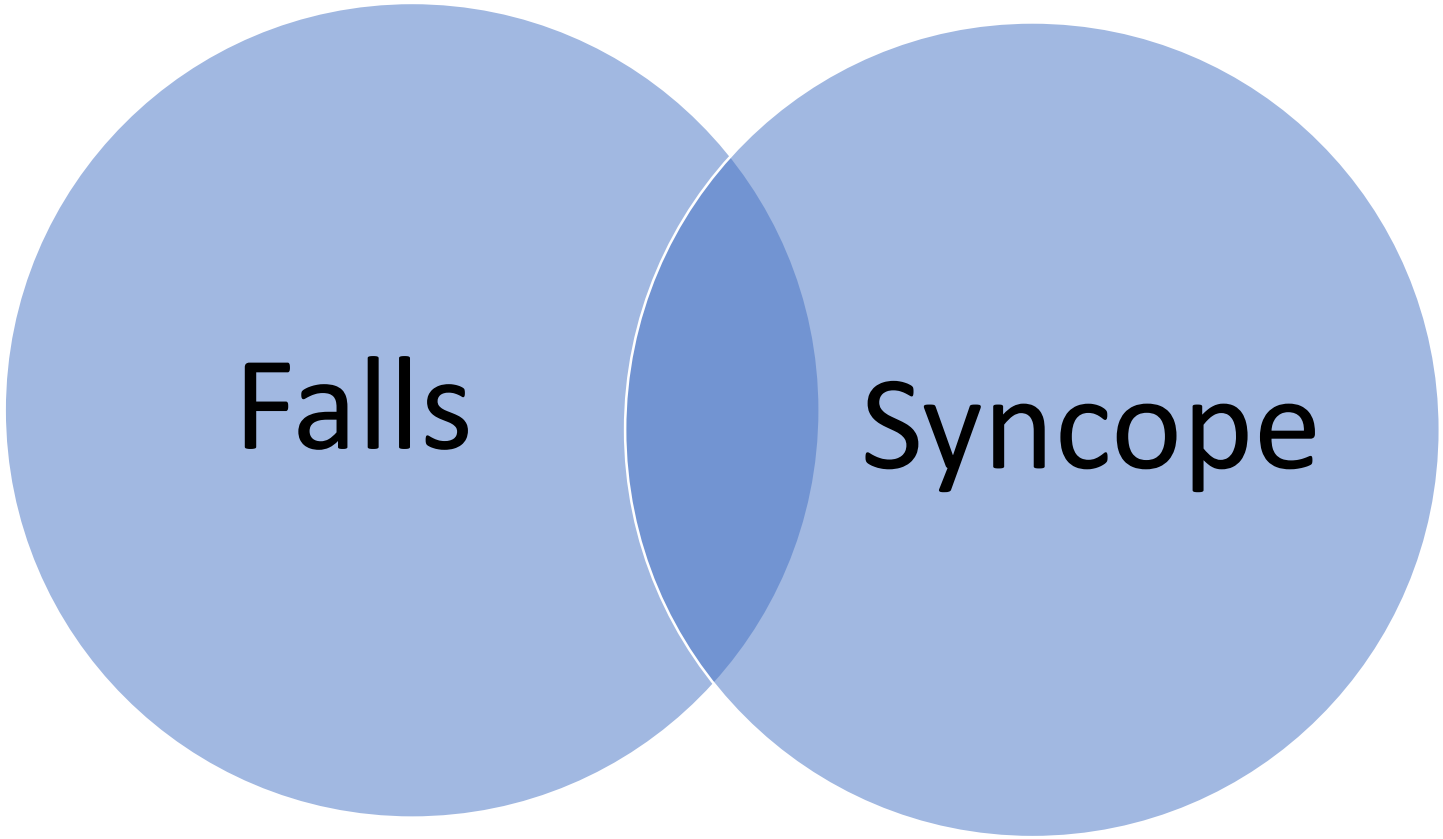
Use this history to decide if the event was syncope or a fall for other reasons



Rubenstein, *Age & Aging*, 2006

CDC Centers for Disease Control and Prevention National Center for Injury Prevention and Control

STEADI Stopping Elderly Accidents, Deaths & Injuries



Gait & balance assessment
Orthostatic vitals
Vision assessment, bifocals to single focus lenses
Medication review & reduction
Footwear change
Correct vitamin deficiencies
New assistive device[1]

12 lead EKG +/- trial of telemetry
Orthostatic Vitals
TTE
Medication review & reduction[2]

1. CDC STEADI Falls Prevention Guideline, 2014
2. Runser LA, et al. Am Fam Physician, 2017

Questions?