Take your Exercise Medicine!

Preventing Falls in the Clinic and Community

JULIA LUBSEN, MD AND KRISTI HALLISY, PT, DSC

FAMILY MEDICINE MIDWEST

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Department of Family Medicine and Community Health
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

Disclosures

Julia Lubsen, MD

- No Disclosures

Kristi Hallisy, PT, DSc

- Will reference *Tai Chi Prime*; an example of community-based tai chi for falls prevention
  (Dr. Hallisy is Tai Chi Prime Instructor)

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Objectives

On completion of this session, participants will be able to:

- Describe why falls are a public health issue nationwide and in the Midwest.
- Apply the CDC STEADI algorithm to implement fall risk screening and assessment in clinic.
- Recommend interventions to address fall risk, including exercise, medication review, patient education, and referrals to appropriate clinical services and community resources.

Definition of a Fall

A fall is any event that leads to an unplanned, unexpected contact with a supporting surface

Shumway-Cook, 1997: *PHYS THER.* 1997; 77:812-819

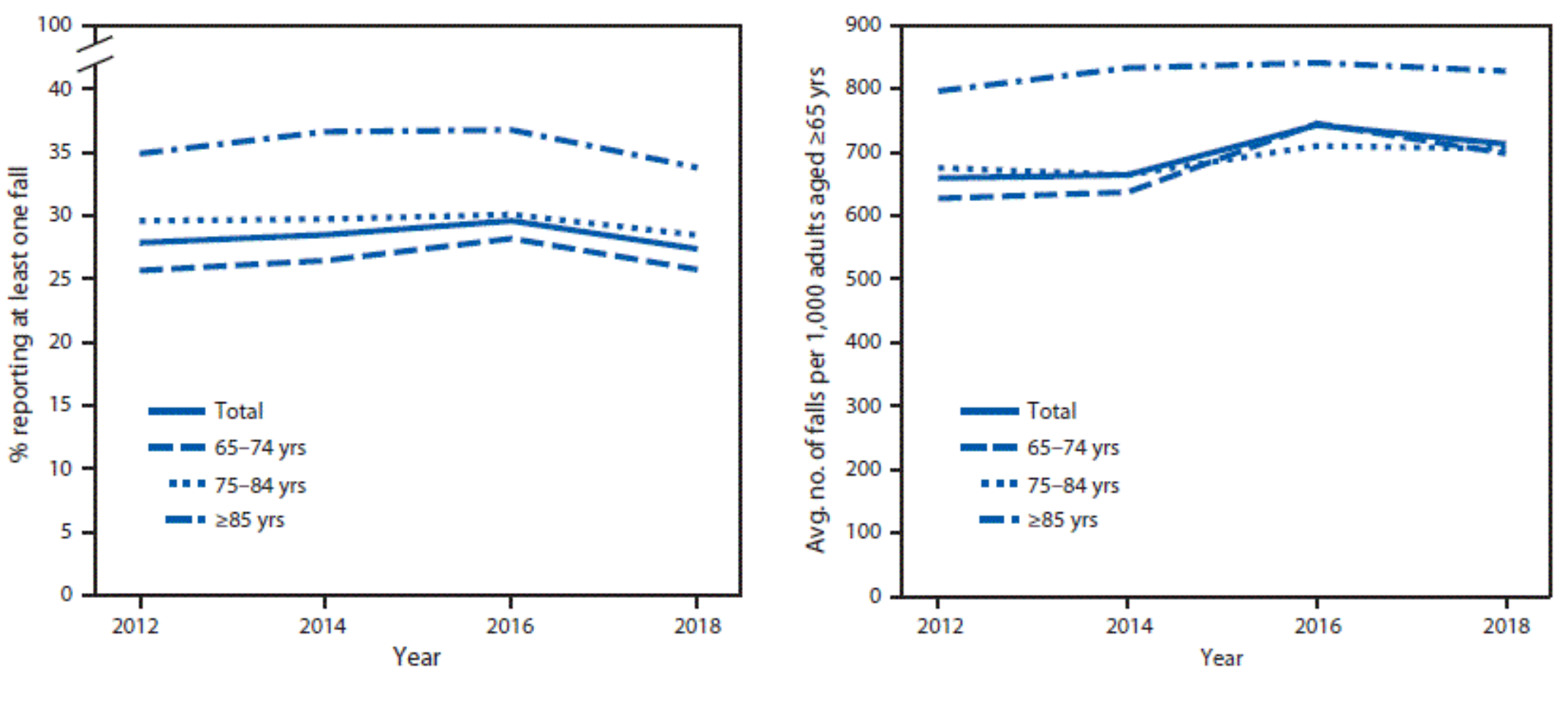
More than one out of four older adults falls each year…

https://www.aging.com/preventing-falls-in-older-adults/

Less than half tell their doctor

https://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html

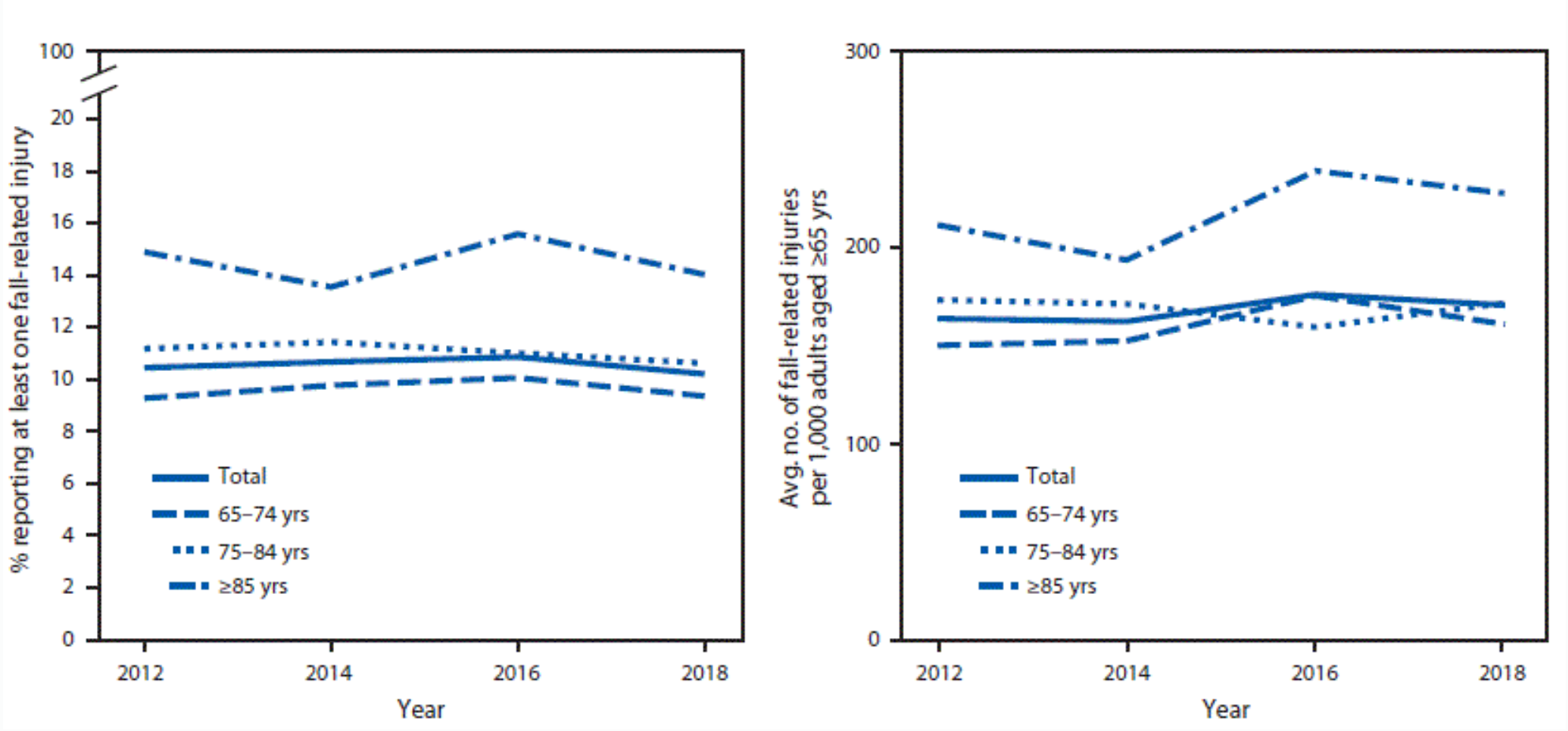
Percentages and rates of self-reported falls



Moreland B, Kakara R, Henry A. Trends in Nonfatal Falls and Fall-Related Injuries Among Adults Aged ≥65 Years — United States, 2012–2018. MMWR Morb Mortal Wkly Rep 2020;69:875–881

*Data from Michigan, Oregon, and Wisconsin were omitted because of the difference in the way these states collected information about falls during 2012, compared with the rest of the states.

Percentages and rates of self-reported fall-related injuries



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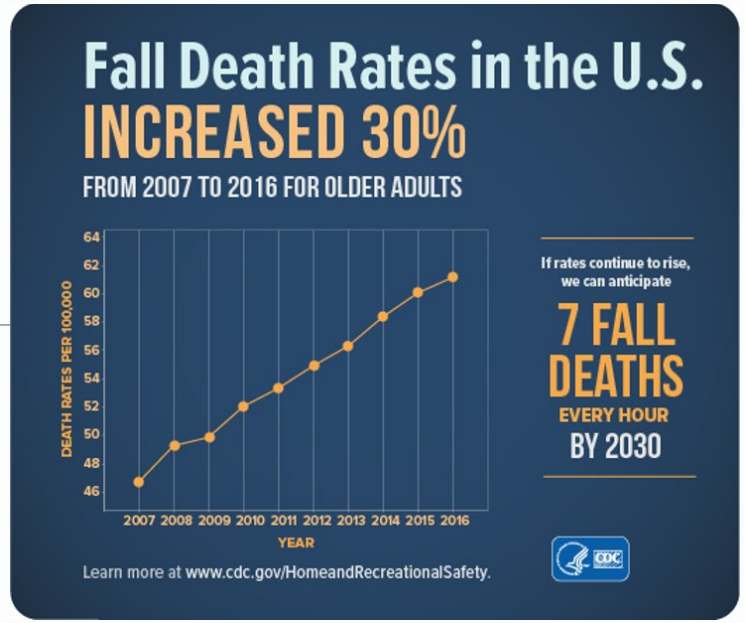
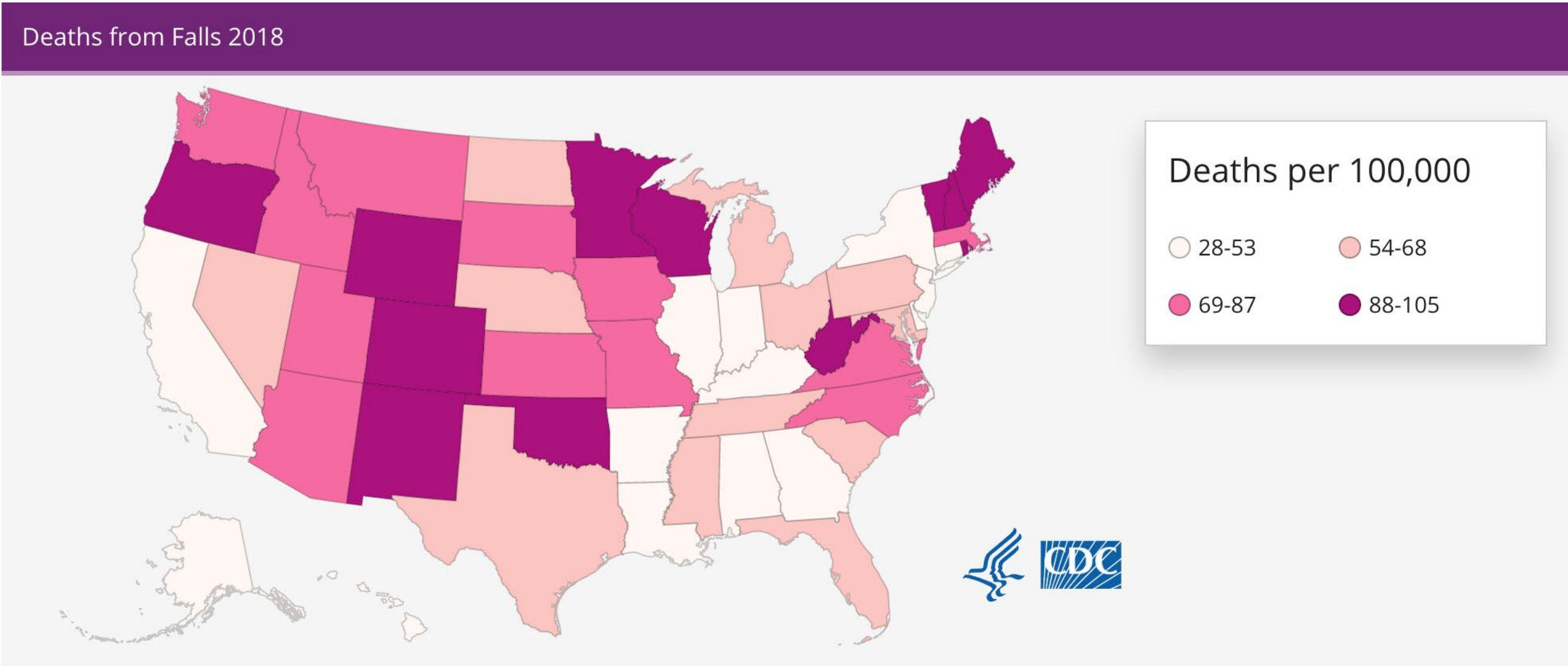
Consequences of Falls



- Fear of Falling
- Social isolation
- Decreased physical activity
- **1 out of 5 falls causes a serious injury** such as broken bones or a head injury
- Hospitalization
- Nursing home placement
- Death

https://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html

Fall death rates for adults 65 and older



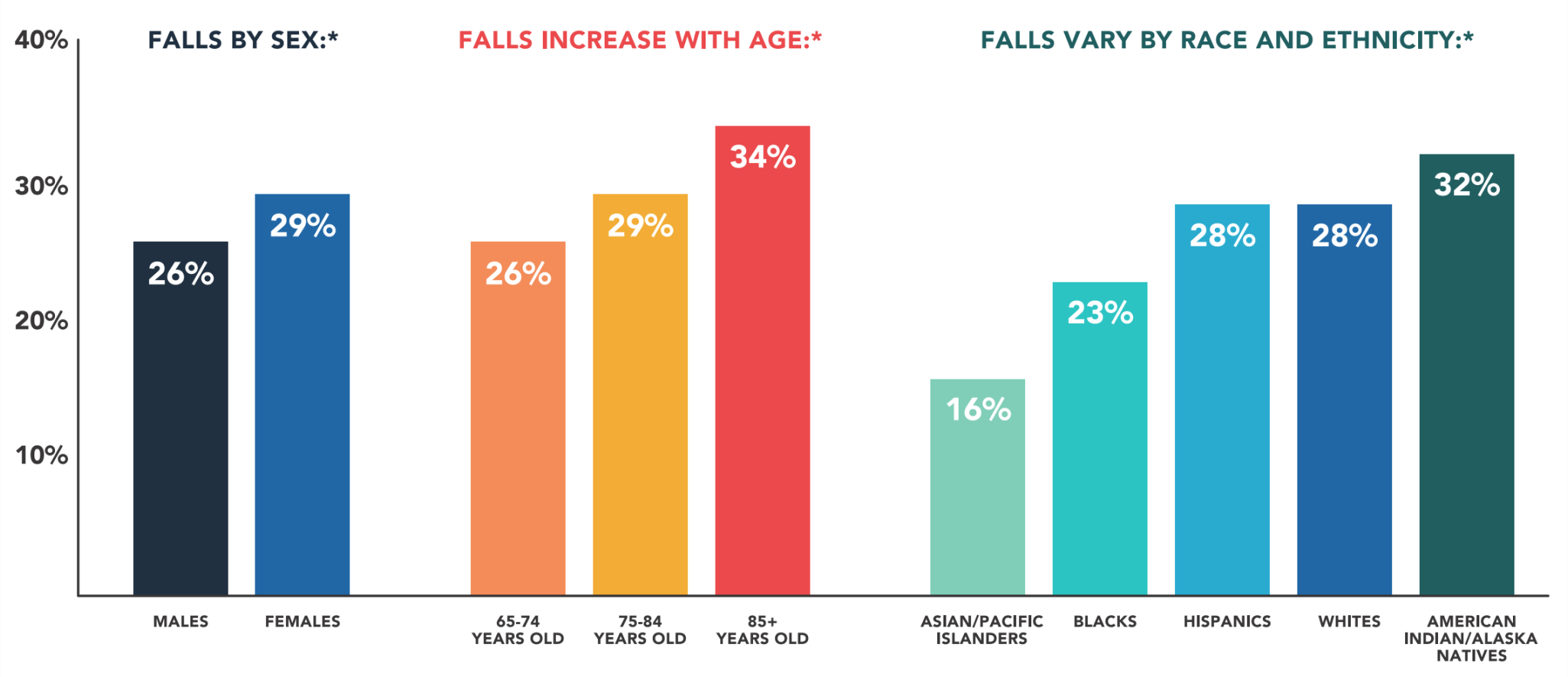
https://www.cdc.gov/homeandrecreationalsafety/falls/data/deaths-from-falls.html

Deaths from Falls in the Midwest (2018)

State	Deaths per 100,000	Compared to national rate	Rank
WI	157	higher	1
MN	124	higher	4
IA	85	higher	16
MI	67	equal	29
IL	50	lower	40
IN	45	lower	44

https://www.cdc.gov/homeandrecreationalsafety/falls/data/deaths-from-falls.html

Percent of older adults who report falling



https://www.cdc.gov/steadi/

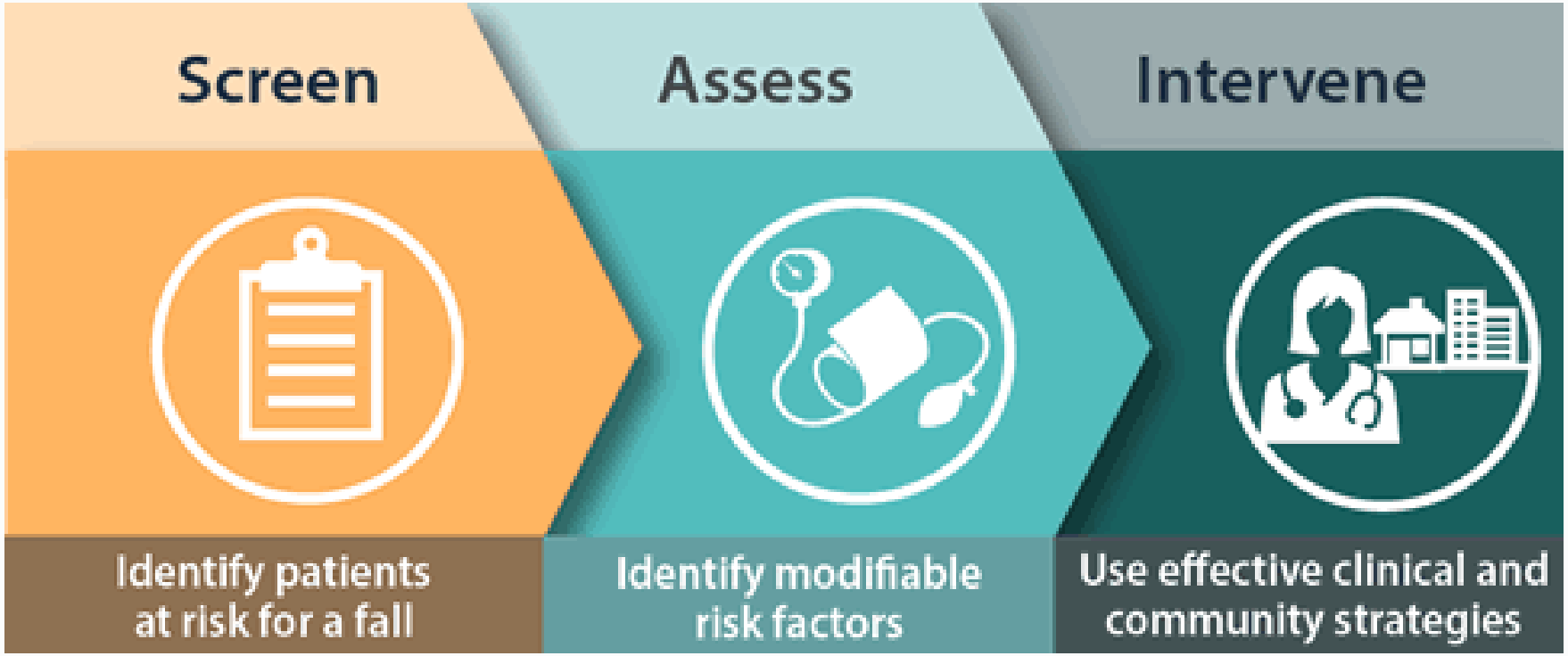
2011 American Geriatrics Society / British Geriatrics Society clinical practice guideline for prevention of falls in older persons

https://www.cdc.gov/steadi

Stevens J. The STEADI Tool Kit: A Fall Prevention Resource for Health Care Providers. *IHS Prim Care Provid*. 2013 Sep; 39(9): 162–166.

Panel on Prevention of Falls in Older Persons AGS, British Geriatrics S. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *J Am Geriatr Soc.* 2011;59(1):148-157.

Stopping Elderly Accidents, Deaths & Injuries (STEADI)



https://www.cdc.gov/steadi/

STEADI Algorithm for Fall Risk Screening, Assessment, and Intervention among Community-Dwelling Adults 65 years and older

START HERE

1 SCREEN for fall risk yearly, or any time patient presents with an acute fall.

Available Fall Risk Screening Tools:

- **Stay Independent: a 12-question tool** [at risk if score ≥ 4]
  - **Important:** If score < 4, ask if patient fell in the past year (If **YES** → patient is at risk)
- **Three key questions** for patients [at risk if **YES** to any question]
  - Feels unsteady when standing or walking?
  - Worries about falling?
  - Has fallen in past year?
    - » If **YES** ask, "How many times?" "Were you injured?"

SCREENED NOT AT RISK

PREVENT future risk by recommending effective prevention strategies.

- Educate patient on fall prevention
- Assess vitamin D intake
  - If deficient, recommend daily vitamin D supplement
- Refer to community exercise or fall prevention program
- Reassess yearly, or any time patient presents with an acute fall

SCREENED AT RISK

2 ASSESS patient's modifiable risk factors and fall history.

Common ways to assess fall risk factors are listed below:

Evaluate gait, strength, & balance
Common assessments:
- Timed Up & Go
- 30-Second Chair Stand
- 4-Stage Balance Test

Identify medications that increase fall risk
(e.g., Beers Criteria)

Ask about potential home hazards
(e.g., throw rugs, slippery tub floor)

Measure orthostatic blood pressure
(Lying and standing positions)

Check visual acuity
Common assessment tool:
- Snellen eye test

Assess feet/footwear

Assess vitamin D intake

Identify comorbidities
(e.g., depression, osteoporosis)

3 INTERVENE to reduce identified risk factors using effective strategies.

Reduce identified fall risk
- Discuss patient and provider health goals
- Develop an individualized patient care plan (see below)

Below are common interventions used to reduce fall risk:

Poor gait, strength, & balance observed
- Refer for physical therapy
- Refer to evidence-based exercise or fall prevention program (e.g., Tai Chi)

Medication(s) likely to increase fall risk
- Optimize medications by stopping, switching, or reducing dosage of medications that increase fall risk

Home hazards likely
- Refer to occupational therapist to evaluate home safety

Orthostatic hypotension observed
- Stop, switch, or reduce the dose of medications that increase fall risk
- Educate about importance of exercises (e.g., foot pumps)
- Establish appropriate blood pressure goal
- Encourage adequate hydration
- Consider compression stockings

Visual impairment observed
- Refer to ophthalmologist/optometrist
- Stop, switch, or reduce the dose of medication affecting vision (e.g., anticholinergics)
- Consider benefits of cataract surgery
- Provide education on depth perception and single vs. multifocal lenses

Feet/footwear issues identified
- Provide education on shoe fit, traction, insoles, and heel height
- Refer to podiatrist

Vitamin D deficiency observed or likely
- Recommend daily vitamin D supplement

Comorbidities documented
- Optimize treatment of conditions identified
- Be mindful of medications that increase fall risk

FOLLOW UP with patient in 30-90 days.

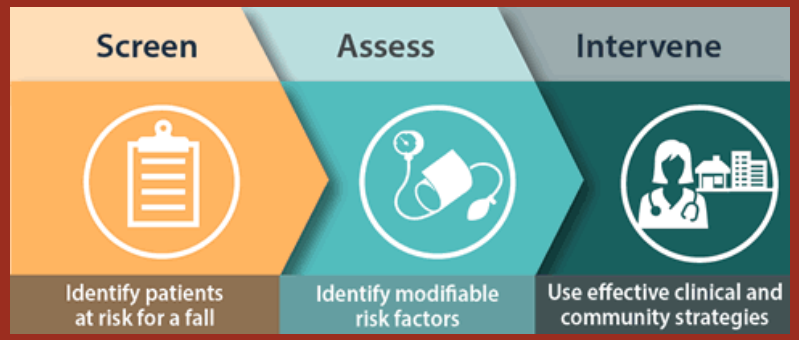
Discuss ways to improve patient receptiveness to the care plan and address barrier(s)

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

https://www.cdc.gov/steadi/

SCREEN

- Screen for fall risk **yearly**, or if patient falls
- Stay Independent Questionnaire →
- At risk if score ≥ 4 or "yes" to any of 3 key questions



Check Your Risk for Falling

Circle "Yes" or "No" for each statement below			Why it matters
Yes (2)	No (0)	I have fallen in the past year.	People who have fallen once are likely to fall again.
Yes (2)	No (0)	I use or have been advised to use a cane or walker to get around safely.	People who have been advised to use a cane or walker may already be more likely to fall.
Yes (1)	No (0)	Sometimes I feel unsteady when I am walking.	Unsteadiness or needing support while walking are signs of poor balance.
Yes (1)	No (0)	I steady myself by holding onto furniture when walking at home.	This is also a sign of poor balance.
Yes (1)	No (0)	I am worried about falling.	People who are worried about falling are more likely to fall.
Yes (1)	No (0)	I need to push with my hands to stand up from a chair.	This is a sign of weak leg muscles, a major reason for falling.
Yes (1)	No (0)	I have some trouble stepping up onto a curb.	This is also a sign of weak leg muscles.
Yes (1)	No (0)	I often have to rush to the toilet.	Rushing to the bathroom, especially at night, increases your chance of falling.
Yes (1)	No (0)	I have lost some feeling in my feet.	Numbness in your feet can cause stumbles and lead to falls.
Yes (1)	No (0)	I take medicine that sometimes makes me feel light-headed or more tired than usual.	Side effects from medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I take medicine to help me sleep or improve my mood.	These medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I often feel sad or depressed.	Symptoms of depression, such as not feeling well or feeling slowed down, are linked to falls.
Total _____		Add up the number of points for each "yes" answer. If you scored 4 points or more, you may be at risk for falling.	

This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk self-assessment tool (Rubenstein et al. J Safety Res; 2011: 42(6)493-499). Adapted with permission of the authors.

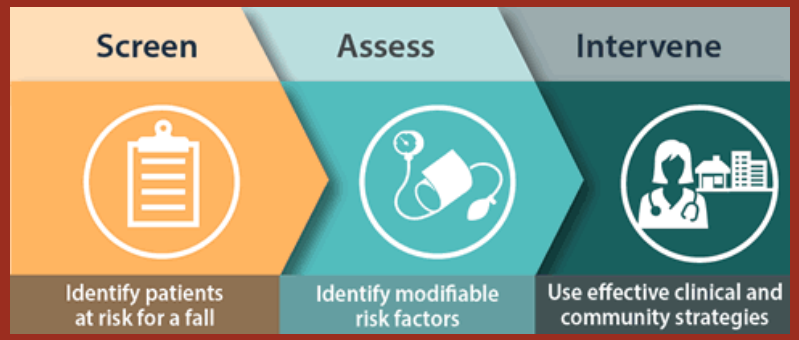
https://www.cdc.gov/steadi/

Negative Screening

- Don’t forget prevention!
  - Patient education
  - Community exercise or fall prevention programs
  - Assess vitamin D intake (*maybe not*)
- Reassess yearly
- Advocate to have falls screening highly visible in the EMR

ASSESS

- Fall history
- Modifiable risk factors

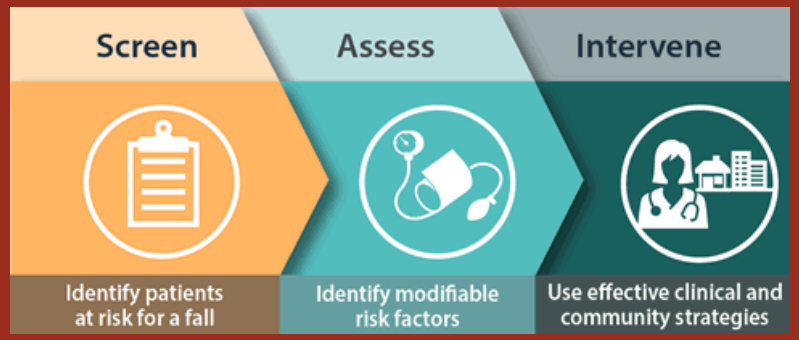


- Evaluate gait, strength and balance
- Medication review
- Home hazards
- Orthostatic blood pressure
- Visual acuity
- Assess feet/footwear
- Vitamin D intake
- Comorbidities

https://www.cdc.gov/steadi/

Intervene

- Develop an individualized care plan



https://www.cdc.gov/steadi/

3 INTERVENE to reduce identified risk factors using effective strategies.

Reduce identified fall risk

- Discuss patient and provider health goals
- Develop an individualized patient care plan (see below)

Below are common interventions used to reduce fall risk:

Poor gait, strength, & balance observed	• Refer for physical therapy • Refer to evidence-based exercise or fall prevention program (e.g., Tai Chi)
Medication(s) likely to increase fall risk	• Optimize medications by stopping, switching, or reducing dosage of medications that increase fall risk
Home hazards likely	• Refer to occupational therapist to evaluate home safety
Orthostatic hypotension observed	• Stop, switch, or reduce the dose of medications that increase fall risk • Educate about importance of exercises (e.g., foot pumps) • Establish appropriate blood pressure goal • Encourage adequate hydration • Consider compression stockings
Visual impairment observed	• Refer to ophthalmologist/optometrist • Stop, switch, or reduce the dose of medication affecting vision (e.g., anticholinergics) • Consider benefits of cataract surgery • Provide education on depth perception and single vs. multifocal lenses
Feet/footwear issues identified	• Provide education on shoe fit, traction, insoles, and heel height • Refer to podiatrist
Vitamin D deficiency observed or likely	• Recommend daily vitamin D supplement
Comorbidities documented	• Optimize treatment of conditions identified • Be mindful of medications that increase fall risk

FOLLOW UP with patient in 30-90 days. Discuss ways to improve patient receptiveness to the care plan and address barrier(s)

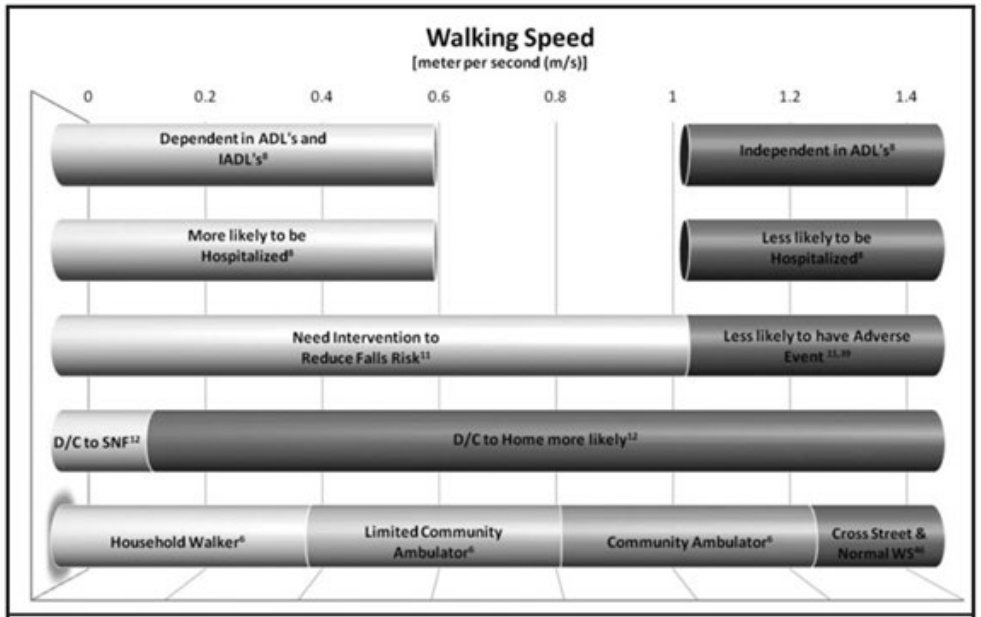
ASSESS Gait: Timed Up and Go

- Get up from chair, walk 10 feet, turn around, walk back, sit down
- Observe postural stability, gait, stride length, and sway
- Fall risk if > 12 seconds

When I say "Go," I want you to:

1. Stand up from the chair.
2. Walk to the line on the floor at your normal pace.
3. Turn.
4. Walk back to the chair at your normal pace.
5. Sit down again.

Walking Speed: The 6th Vital Sign



0 mph	0.4 mph	0.9 mph	1.3 mph	1.8 mph	2.2 mph	2.7 mph	3.1 mph
10 meter walk time	50 sec	25 sec	16.7 sec	12.5 sec	10 sec	8.3 sec	7.1 sec
10 foot walk time	15.2 sec	7.6 sec	5 sec	3.8 sec	3 sec	2.5 sec	2.2 sec

ADL: activities of daily living; IADL: instrumental ADLs; D/C: discharged; WS: walking speed; mph: miles per hour; sec: seconds

Figure 1. A collection of walking speed times that are linked to dependence, hospitalization, rehabilitation needs, discharge locations, and ambulation category.

Walking speed (leg strength and balance) are key predictors of independence, mobility and quality of life.

Walking speed predicts the post-hospital discharge location 78% of the time.

Fritz S. Lusardi M. (2010). White Paper: Walking Speed: the Sixth Vital Sign. *J Geriatric Physical Therapy* 32(2): 2-5. Figure 1.

Timed Up and Go

- Sensitivity 31%, Specificity 74% with cut-off of >13.5 seconds
- More useful for *ruling in* rather than ruling out fall risk
- TUG score not a significant predictor of falls (OR = 1.01, 95% CI 1.00-1.02)
- **Timed Up and Go test should not be used in isolation to identify adults at high risk of falls**

Barry E, Galvin R, Keogh C, Horgan F, Fahey T. Is the Timed Up and Go test a useful predictor of risk of falls in community dwelling older adults: a systematic review and meta-analysis. *BMC Geriatr.* 2014;14:14.

ASSESS Strength: 30-second Chair Stand

- Tests leg strength and endurance

1. Sit in the middle of the chair.
2. Place your hands on the opposite shoulder crossed, at the wrists.
3. Keep your feet flat on the floor.
4. Keep your back straight, and keep your arms against your chest.
5. On **"Go,"** rise to a full standing position, then sit back down again.
6. Repeat this for 30 seconds.

Chair Stand
Below Average Scores

AGE	MEN	WOMEN
60-64	< 14	< 12
65-69	< 12	< 11
70-74	< 12	< 10
75-79	< 11	< 10
80-84	< 10	< 9
85-89	< 8	< 8
90-94	< 7	< 4

A below average score indicates a risk for falls.

ASSESS Balance: 4-stage Balance Test

- Fall risk: Cannot hold tandem stance ≥ 10 secs

	① Stand with your feet side-by-side.
	② Place the instep of one foot so it is touching the big toe of the other foot.
	③ Tandem stand: Place one foot in front of the other, heel touching toe.
	④ Stand on one foot.

https://www.cdc.gov/steadi/

INTERVENE: Gait, Strength and Balance

- **Group exercise**
  - Reduces risk of falling (RR 0.85, 95% CI 0.76-0.96, N = 5333)
  - Reduces rate of falls (RaR 0.71, 95% CI 0.63-0.82, N = 3622)
- **Home-based exercise**
  - Reduces risk of falling (RR 0.78, 95% CI 0.64-0.94, N = 714)
  - Reduces rate of falls (RaR 0.68, 95% CI 0.58-0.80, N = 951)
- **Tai Chi**
  - Reduces risk of falling (RR 0.71, 95% CI 0.57-0.87, N = 1625)

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.

INTERVENE: Gait, Strength and Balance

- **Exercise interventions**
  - Reduce risk of falling (RR 0.89, 95% CI 0.81-0.97, n = 7297)
  - Reduce injurious falls (IRR, 0.81, 95% CI 0.73-0.90, n = 7297)
  - Non-significant reduction in rate of falls
  - No association with mortality

Guirguis-Blake JM, et al. Interventions to Prevent Falls in Older Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA.* 2018;319(16):1705-1716.

ASSESS: Medications

- STEADI R_x: Guide for Community Pharmacists →
- Beers Criteria
- STOPP / START Criteria
- Anticholinergic burden scales
- Orthostatic vital signs

Anticonvulsants
Antispasmodics
Antidepressants
Benzodiazepines
Antihypertensives
Opioids
Antipsychotics
Sedative hypnotics

https://www.cdc.gov/steadi/
2019 Updated AGS Beers Criteria. *J Am Geriatr Soc.* 2019;67(4):674-694.

O'Mahony D, et al. STOPP/START criteria. *Age Ageing.* 2015;44(2):213-218.
Salahudeen et al. *BMC Geriatr.* 2015;15:31.

INTERVENE: Medications

- **A prescribing modification program for primary care physicians**
  - Reduces risk of falling (RR 0.61, 95% CI 0.41-0.91, N = 659)
- **Gradual withdrawal of psychotropic medication**
  - Reduces rate of falls (RaR 0.34, 95% CI 0.16-0.73, N = 93)
  - But not risk of falling
- Reduce medications causing orthostasis, review BP goal

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.

Home Hazards

ASSESS:

- University of Buffalo Home Safety Self-Assessment Tool
- Occupational Therapy

INTERVENE:

- **Home safety assessment and intervention**
  - **Reduces risk of falling** (**RR 0.88**, 95% CI 0.80-0.96, N = 4051)
  - **Reduces rate of falls** (**RR 0.81**, 95% CI 0.68-0.97, N = 4208)
  - More effective when delivered by an occupational therapist; to patients with higher risk of falling, severe visual impairment

http://sphhp.buffalo.edu/rehabilitation-science/research-and-facilities/funded-research/aging/home-safety-self-assessment-tool.html

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.

Vision

ASSESS: visual acuity (Snellen chart)

INTERVENE:

- CAUTION: Sometimes vision interventions can increase fall risk
- Consider switching multifocal glasses to single lenses in active seniors
- First eye cataract surgery in women reduced rate of falls (RaR 0.66, 95% CI 0.45-0.95, N = 306), but 2nd eye cataract surgery did not

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.

Feet / Footwear

ASSESS:

- Foot deformities, circulation, sensation, proprioception, footwear
- Consider B12 deficiency, other causes of neuropathy

INTERVENE:

- An **anti-slip shoe device reduced rate of falls** in icy conditions (RaR 0.42, 95% CI 0.22-0.78, N = 109).
- **Multifaceted podiatry** including foot/ankle exercises vs. standard podiatry in people with foot pain **reduced rate of falls** (RaR 0.64, 95% CI 0.45-0.91, N=305) but not the risk of falling.

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.

Vitamin D

ASSESS: measure 25-OH vitamin D

INTERVENE:

- Overall, vitamin D did not reduce rate of falls (RaR 1.00, 95% CI 0.90-1.11, N = 9324) or risk of falling (RR 0.96, 95% CI 0.89-1.03, N = 26,747)
- **Vitamin D may decrease falls in people who are vitamin D deficient**
- CAUTION: Annual high-dose cholecalciferol (500,000 IU) increased falls and injuries in one trial.

Gillespie LD, Robertson MC, Gillespie WJ, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev.* 2012(9):CD007146.
Guirguis-Blake JM, et al. Interventions to Prevent Falls in Older Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA.* 2018;319(16):1705-1716.

Comorbidities

- Treat osteoporosis
- Treat depression, anxiety
- Review medications that contribute to fall risk

STEADI-Rx Guide for Community Pharmacists
https://www.cdc.gov/steadi/pdf/Steadi-Implementation-Plan-508.pdf

STEADI-Rx Community Pharmacy Algorithm for Fall Screening, Assessment, and Care Coordination
https://www.cdc.gov/steadi/pdf/provider/steadi-rx/STEADIRx-Algorithm-508.pdf

USPSTF Recommendations

Population	Recommendation	Grade
Adults 65 years or older	The USPSTF recommends exercise interventions to prevent falls in community-dwelling adults 65 years or older who are at increased risk for falls.	B
Adults 65 years or older	The USPSTF recommends that clinicians selectively offer multifactorial interventions to prevent falls to community-dwelling adults 65 years or older who are at increased risk for falls. Existing evidence indicates that the overall net benefit of routinely offering multifactorial interventions to prevent falls is small. When determining whether this service is appropriate for an individual, patients and clinicians should consider the balance of benefits and harms based on the circumstances of prior falls, presence of comorbid medical conditions, and the patient's values and preferences. See the Clinical Considerations section for information on risk assessment for falls.	C
Adults 65 years or older	The USPSTF recommends against vitamin D supplementation to prevent falls in community-dwelling adults 65 years or older.	D

CDC Compendium of Falls Interventions

SINGLE INTERVENTION

- ***Exercise****
- Home Modification
- Clinical (e.g. Vitamin D, decrease psychotropic medications, vision, cataracts, pacemaker, podiatry)

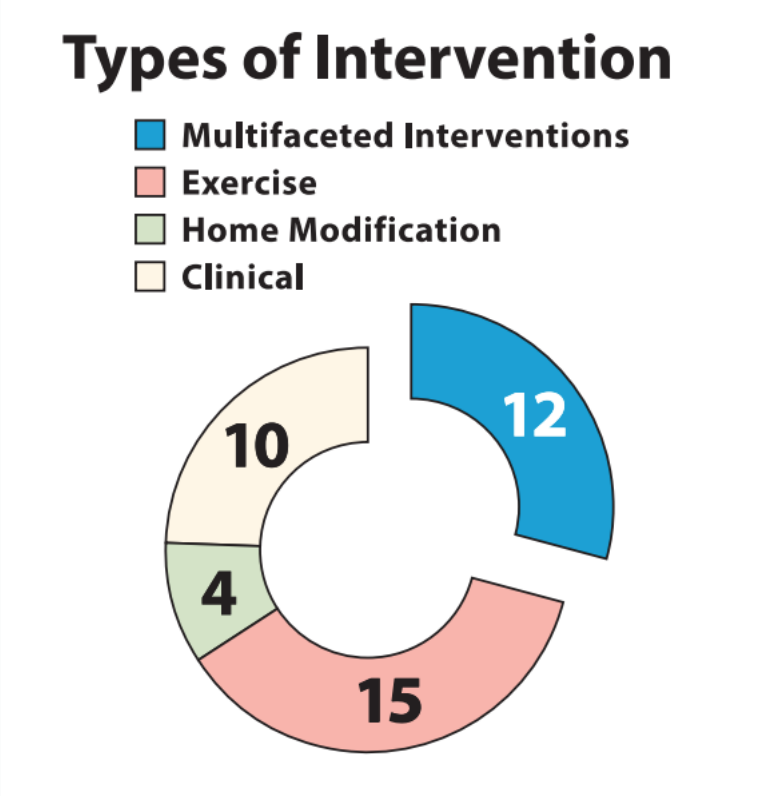
MULTI-FACETED PROGRAMS

- Reduce disability and/or falls by improving physical fitness, vision, hearing and home safety; modifying alcohol use and reducing psychoactive medication use; etc.

https://wihealthyaging.org/stepping-on-consumer

Stevens JA, Burns ER. A CDC Compendium of Effective Fall Interventions: What Works for Community-Dwelling Older Adults. 3rd ed. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, 2015. Compendium of Falls Interventions. Available at: https://www.cdc.gov/homeandrecreationalsafety/pdf/falls/cdc_falls_compendium-2015-a.pdf

Referral Recommendations



Exercise Interventions to Prevent Falls

1. Exercise programs should provide high challenge to balance:
   - Reduce the base of support (e.g. two legs to one leg)
   - Move the center of gravity over the base of support
   - Stand without using the arms for support

2. At least 3 hours of exercise should be undertaken each week*
   - Aerobic: 30 min/day (150 min/week)
   - Strength training: 2-3x/week
   - Multicomponent exercise

National Physical Activity Guidelines for Adults 65+ years of age

3. ***Ongoing*** exercise is necessary or benefits will be lost

Sherrington C, Michaleff ZA, Fairhall N et al. Exercise to prevent falls in older adults: an updated systematic review and meta-analysis. Br J Sports Med. 2017;51:1749-1757.
National Physical Activity Guidelines, 2nd ed. (2018). https://health.gov/our-work/physical-activity

Exercise Interventions to Prevent Falls

4. Falls prevention exercise should be targeted at the general community as well as community-dwellers with an ↑ risk of falls

5. Fall prevention exercise may be undertaken in a group or home-based setting

6. Walking training may be added to balance training but high-risk individuals should not be prescribed brisk walking programs

Sherrington C, Michaleff ZA, Fairhall N et al. Exercise to prevent falls in older adults: an updated systematic review and meta-analysis. Br J Sports Med. 2017;51:1749-1757.

Exercise Interventions to Prevent Falls

7. Strength training may be included in addition to balance training
   *8-10 muscle groups; 8-12 reps (70%RM) x1 GOOD set (minimum);
   2-3 days/week; full-range; 6-seconds per rep (*ACSM Guidelines*)

8. Exercise providers should make referrals for other risk factors to be addressed

9. Exercise as a single intervention may prevent falls in people with Parkinson's disease or cognitive impairment. There is currently no evidence that exercise as a single intervention prevents falls in stroke survivors or people recently discharged from hospital. Exercise should be delivered to these groups by providers with particular expertise.

Sherrington C, Michaleff ZA, Fairhall N et al. Exercise to prevent falls in older adults: an updated systematic review and meta-analysis. Br J Sports Med. 2017;51:1749-1757.
ACSM's Health & Fitness Journal. 13(4):14-22, JULY-AUGUST 2009

Keys to Better Balance: Criteria Checklist

Multi-Component Exercise

- BALANCE
  - Static Balance Activities
  - Dynamic Balance Activities
  - Dynamic Gait Training
  - Dual-tasking
- STRENGTH

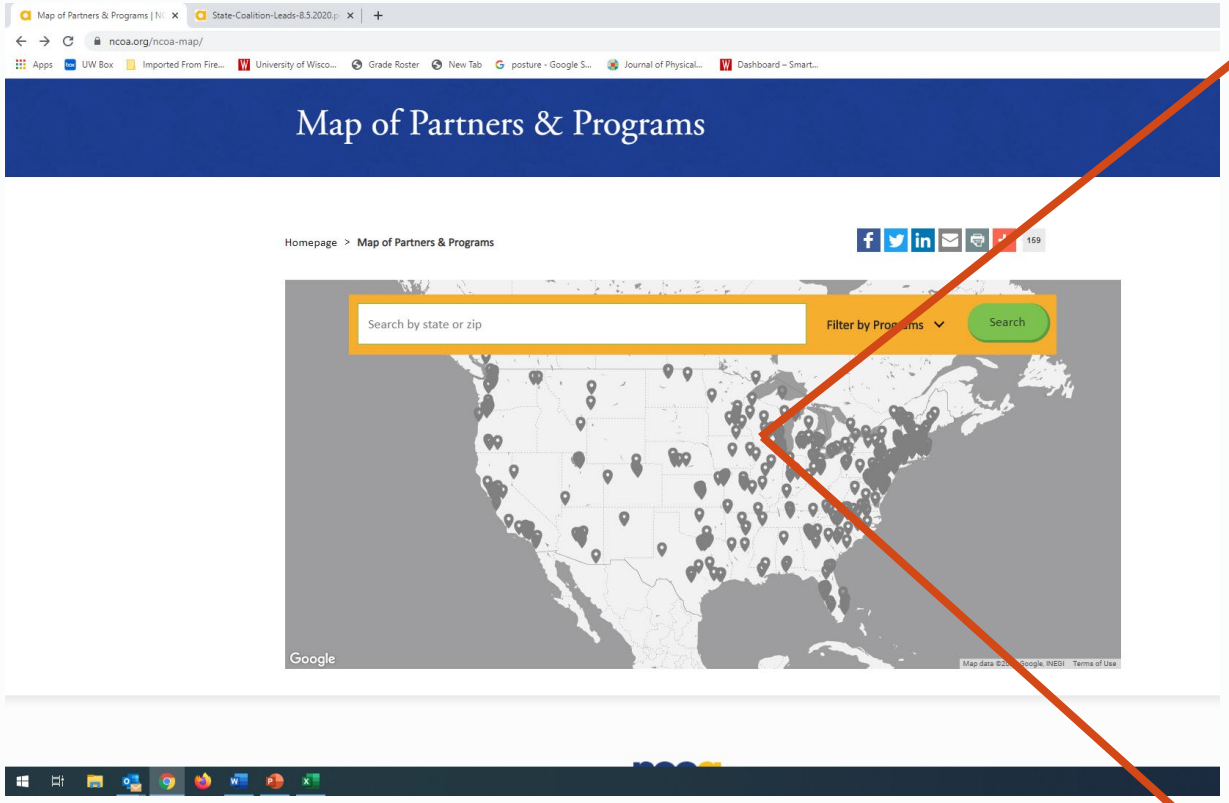
Dosage: Research shows that to be effective to improve balance, exercise dose is 50 hours of moderate-to-high balance challenge over a 6-month time period and ongoing (2-hours/week x26 weeks or 3-hours/week x 4 months)

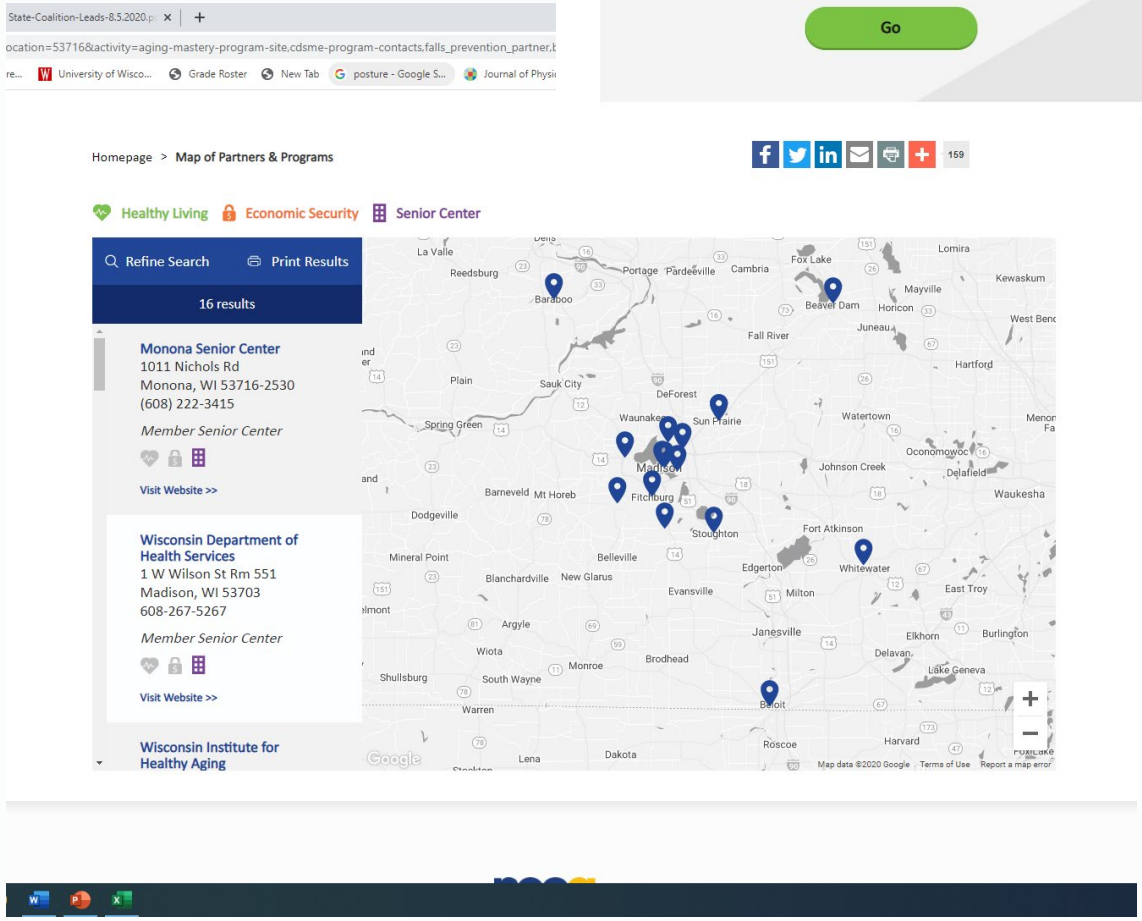
SELECTING PROGRAMS

NATIONAL RESOURCES – link to State Agencies	Find your LOCAL PROGRAMS
Centers for Disease Control & Prevention http://www.cdc.gov/homeandrecreationalsafety/falls/programs.html	Safe Communities of Madison – Dane Co., WI https://safercommunity.net/balance/
National Council on Aging (NCOA) https://www.ncoa.org/	Goodman Community Center https://www.goodmancenter.org/
Administration for Community Living (ACL) https://acl.gov/about-community-living	BeWell Madison https://www.bewellcommunitycollective.com/
Aging and Disability Resource Networks https://acl.gov/programs/aging-and-disability-networks	Tai Chi Center of Madison http://www.taichicenterofmadison.com/
Area Agencies on Aging (search by your STATE) https://acl.gov/programs/aging-and-disability-networks/area-agencies-aging	ACL State and Tribal Evidence-Based Falls Prevention Program Grantees https://www.ncoa.org/center-for-healthy-aging/falls-resource-center/falls-prevention-grantees-falls-resource-center/falls-prevention-grantee-profiles/
State Units on Aging (search by your STATE) https://acl.gov/programs/aging-and-disability-networks/state-units-aging	

National Council on Aging

Search for Falls Prevention Programs by Zip Code





Evidence-Based Falls Prevention Programs

Explore evidence-based programs than have been proven to help older adults reduce their risk of falling.

Go

https://www.ncoa.org/ncoa-map/

Tai Chi Chuan

- A form of Qigong – “energy cultivation”
- Chinese martial art originally practiced by young athletic warriors to promote balance and longevity
- Mind-body discipline that promotes optimal mental and physical function

Table 1. Key features of tai chi

FEATURE	DESCRIPTION
Mindfulness	Awareness of the current moment is cultivated during tai chi by focusing on the body's position, movements, and sensations
Imagery	Images are used as a learning strategy (eg, one of the moves is called *wave hands like clouds*)
Structural alignment	Movements are biomechanically efficient, calling for the least amount of effort
Flexibility and relaxation	Circular and flowing motions provide dynamic stretching and help to shift the body and mind into a state of deeper relaxation
Strength and balance	Placing weight on one foot at a time in a slightly flexed position leads to greater strength in the lower extremities and improved balance
Natural breathing	Rhythmic breathing with movement appears to improve gas exchange and promote calmness
Social support	Positive interactions within a community give a sense of belonging and support
Integration of body, mind, and spirit	Tai chi creates a practical framework for living a more holistic life

Adapted from Wayne.[3]

Wayne PM. The Harvard Medical School guide to tai chi: 12 weeks to a healthy body, strong heart, and sharp mind. Boston, MA: Shambhala Publications Inc, 2012.

Health Benefits of Tai Chi

EXCELLENT Evidence	GOOD Evidence	FAIR Evidence
• ***Falls prevention*** • Osteoarthritis • Parkinson's disease • COPD (lung disease) • Cognitive capacity	• Depression • Cardiac Rehab • Stroke Rehab • Cognitive impairment and dementia	• Quality of life for patients with cancer • Fibromyalgia • Hypertension • Osteoporosis
These benefits overlap well with the leading causes of mortality and morbidity seen in older adults		

Adapted from: Huston P, McFarlane B. Health benefits of tai chi. *Canadian Family Physician* Nov 2016, 62 (11) 881-890.

Evidenced-based Models of Tai Chi

- Tai Chi Moving for Better Balance™ (Li, 2015)
- Central Sydney Tai Chi (Voukelatos, 2007)
- Simplified Tai Chi (Wolf, 1996)
- *Tai Chi Prime™* (Chewning, Hallisy, et al, 2019)

Tai Chi is a readily adaptable exercise accessible to a wide variety of ages and skill levels

Yu T. Tai Chi Fundamentals® Adapted Program with Optional Side Support, Walker Support and Seated Versions [Book]. Taos NM: Uncharted Country Publishing, 2015

CDC Compendium of Effective Fall Interventions @ https://www.cdc.gov/homeandrecreationalsafety/pdf/falls/cdc_falls_compendium-2015-a.pdf

Chewning B, Hallisy KM, Mahoney JE, et. al. Disseminating Tai Chi in the community: promoting home practice and improving balance. *Gerontologist,* 2019 Feb 27. pii: gnz006. DOI: 10.1093/geront/gnz006

Pandemic Falls Prevention

Make EXERCISE Part of Daily LIFE…

Centering in the Horse Stance	Bear Roots on One Leg	Tai Chi Stance	High Step
			
Establish mindfulness, postural alignment and diaphragmatic breathing	Lateral weight-shift of center of mass over base of support	Anterior-posterior weight-shift of COM (key to ADL function)	Single leg balance

Chewning B, Hallisy KM, Mahoney JE, et. al. Disseminating Tai Chi in the community: Promoting home practice and improving balance. *Gerontologist,* 2019 Feb 27. pii: gnz006. DOI: 10.1093/geront/gnz006

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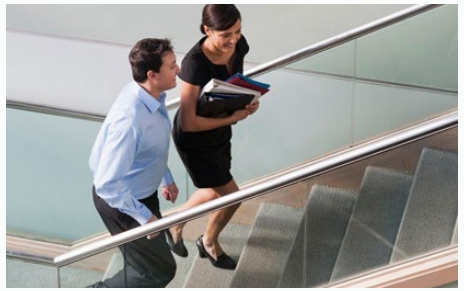

Examples of LiFE Program exercises			
Strategy	**Exercise**	**Setting**	**Upgraded exercise**
Balance Training			
Reduce base of support	Tandem stand Tandem walking	Brushing teeth Ironing Walking down the hallway	Standing on one leg
Move to the limits of sway	Lean to one side as far as possible	Talking on the telephone	Hold longer Reduce base of support
Strength Training			
Bend your knees	Squatting instead of bending your back	Putting laundry away in drawers Putting a plate away in the kitchen cupboard	Emptying the dishwasher Put the dishwashing liquid on a lower shelf

Clemson L, Fiatarone-Singh MA, Bundy A, et al. Integration of balance and strength training into daily life activity to reduce rate of falls in older people (the LiFE study): randomised parallel trial. *BMJ* 2012; 345 :e4547

Reducing Fall Risk & Promoting Change

Case-based group discussion: Guided group discussion (10 minutes)

1) Examination: Discuss findings and identify risk factors
2) Identify risk level (Low, Moderate, High) - Algorithm
3) Discuss, “What is something you’d like to do in the next 1-2 weeks or month to reduce your risk for falls?”
4) Create action plan
   - What? How? When? Resources?

Cases

https://www.cdc.gov/steadi/materials.html

CASE STUDY

Mrs. Booker

Mrs. Booker is a 76-year-old woman who lives independently in her own home. She has come in to your primary care clinic for a wellness visit.

Self-Assessment

Mrs. Booker completes the *Stay Independent* brochure in the waiting room. She circles "Yes" for the statements, "I have fallen in the last 6 months," and "I take medicine to help me sleep or improve my mood." Her responses result in a risk score of 3.

Medical History

When asked, Mrs. Booker reports she fell the previous week, but wasn't hurt, so she didn't seek medical attention. She says she was out walking with a friend. They were talking and she wasn't looking where she was going, and she tripped over a crack in the sidewalk. This was her first fall.

Mrs. Booker reports that she usually walks about 2 miles each day around her neighborhood. She feels steady when walking at all times, even when outdoors. She tries to avoid potholes and usually watches out for cracks in the sidewalk so she won't trip. She's not afraid of falling. Walking is her only form of exercise.

Risk score: 3

ASSESSMENT

Gait, Strength, and Balance
(Completed and documented by the medical assistant)

Timed Up and Go:
10 seconds
Gait: decreased arm swing, but otherwise normal

30-Second Chair Stand:
14 Stands
Able to rise from the chair without using her arms to push herself up

4-Stage Balance Test:
10 seconds, full tandem stance
Able to hold a full tandem stance for 10 seconds unsupported without postural sway

Thank You!

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