Falls In The Geriatric Population

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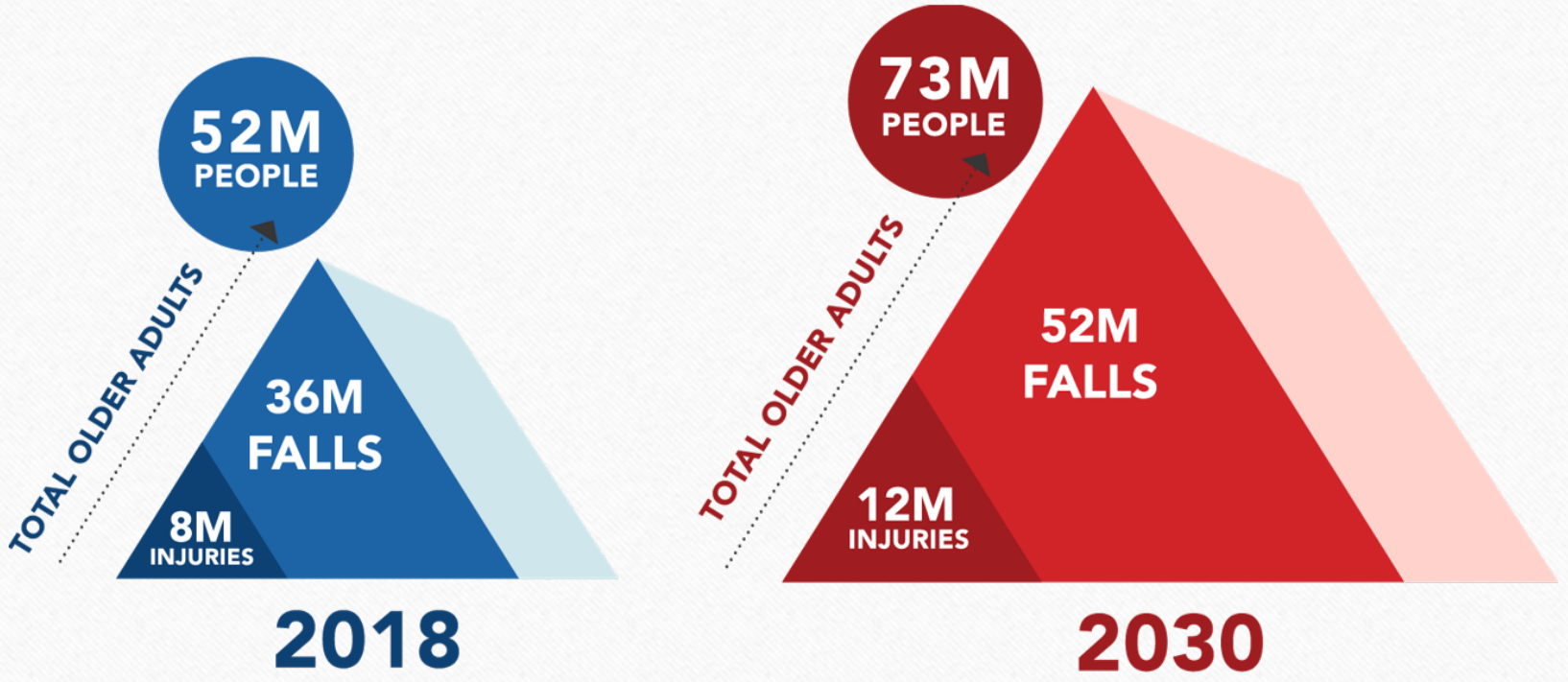
Agenda

- Burden of falls in the geriatric population
- Causes of falls in the geriatric population
- Assessment
- Interventions for falls in the geriatric population

Falls In The Geriatric Population

- 36 million falls per year resulting in:
  - 8 million injuries
  - 2.8 million emergency room visits
  - 950,000 hospitalizations
  - 32,000 deaths

Projection of Fall Burden



Consequences of Falls In the Geriatric Population

- >95% of hip fractures are due to falls
- Leading cause of traumatic brain injury
- Injury leading to social isolation/loneliness and loss of function
- Increases the risk of nursing home placements (where risk of falling triples)
- Between 2009 and 2018, death rates from falls increased by 30%

Leading Causes of Death Among the Geriatric Population

- 1. Heart Disease
- 2. Cancer
- 3. Chronic Lower Respiratory Disease
- 4. Stroke
- 5. Alzheimer's Disease
- 6. Diabetes
- **7. Unintentional Injury**
- 8. Influenza and Pneumonia
- 9. Kidney Disease
- 10. Parkinson's Disease

Unintentional Injury

- 1. Fall
- 2. Motor Vehicle Accident that is traffic related
- 3. Unspecified

Reasons For Under Reported Falls In The Geriatric Population

- Patients believe that falls are a normal part of aging
- Patients feel that falls may lead to loss of independence
- Patients do not know common fall risk factors

Provider Barriers To Appropriate Fall Assessment and Prevention

- Competing healthcare priorities
- Lack of time during office visits
- Limited knowledge of fall prevention
- Limited communication between providers across different specialties and services
- Low reimbursement

Medications and Falls

- In a 12-month period
  - 82% of geriatric patients talked to no one about medications that could result in falls
  - 23% talked to their provider and pharmacist about fall risk medications
  - 3% talked to their family, caregiver or other non-providers

Modifiable and Nonmodifiable Risk Factors

Table 2. Risk Factors for Falls in Older Persons

Potentially modifiable	Potentially modifiable *(continued)*	Nonmodifiable
Cardiac	Neurologic	Age older than 80 years
Cardiac arrhythmias	Delirium	Arthritis
Congestive heart failure	Dizziness or vertigo	Cognitive impairment/dementia
Hypertension	Parkinson disease and other movement disorders	Female sex
Environmental hazards	Peripheral neuropathy	History of cerebrovascular accident/transient ischemic attack
Medication use (see Table 3; risk is higher when four or more medications are used simultaneously)	Psychological	History of falling
Metabolic	Depression	History of fractures
Diabetes mellitus	Fear of falling	Recently discharged from the hospital (within one month)
Low body mass index	Sensory impairment	White race
Vitamin D deficiency	Auditory impairment	
Musculoskeletal	Multifocal lens	
Balance impairment	Visual impairment	
Foot problems	Other	
Gait impairment	Acute illness	
Impaired activities of daily living	Anemia	
Limited activity	Cancer	
Lower extremity muscle weakness	Inappropriate footwear	
Musculoskeletal pain	Nocturia	
Use of an assistive device	Obstructive sleep apnea	
	Postural hypotension	
	Urinary incontinence	

Adapted with permission from Moncada LV. Management of falls in older persons: a prescription for prevention. Am Fam Physician. *2011;84(11):1267-1268, with additional information from references 6, and 11 through 15.*

Strongest Modifiable Risk Factors

- Balance Impairment
- Gait Impairment
- Muscle Weakness

The 3 Components of Developing Fall Risk Treatment Plan in the Geriatric Population

- Screen
- Assess
- Intervene

Stay Independent Questionnaire

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. Discuss this brochure with your doctor.	

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.

Stay Independent Questionnaire

- Score of less than 4
  - Not at fall risk
  - Discuss strategies to prevent future fall risk
- Score of less than 4 AND patient has fallen in the past year
  - At risk of falls
  - Conduct fall assessment
- Score of 4 or more
  - At risk for falls
  - Conduct fall assessment

Berg Balance Scale

Table 1
Berg balance test

1. Sitting to standing
2. Standing unsupported
3. Sitting unsupported
4. Standing to sitting
5. Transfers
6. Standing with eyes closed
7. Standing with feet together
8. Reaching forward with an outstretched arm
9. Retrieving object from floor
10. Turning to look behind
11. Turning 360°
12. Placing alternate foot on stool
13. Standing with one foot in front of the other foot
14. Standing on one foot

Adapted from Physical Therapy. 1996; 76 : 579.

Berg Balance Scale Scoring

- Provide a score of 0 - 4 for each question
- Score of 41- 56 = Low fall risk and can ambulate safely with or without an assistive device
- Score of 21 - 40 = Moderate fall risk and can ambulate safely with or without an assistive device
- 0 - 20 = High fall risk (the less the score the greater the fall risk) and patient will need assistance with an assistive device to make sure they are safe

Tinetti Performance Oriented Mobility Assessment

POMA is a task- oriented test that measures an older adult's gait and balance abilities by an ordinal scale of 0 (most impairment) to 2 (independence). The assessments takes **10 - 15 minutes to complete.**

(See: Tinetti ME. Performance-oriented assessment of mobility problems in elderly patients. JAGS 1986; 34: 119-126. Scoring description: PT Bulletin Feb. 10, 1993)

Name: **Date:**

Location: **Administrator:**

Balance Assessment

Instructions: Subject is seated in a hard, armless chair. The following maneuvers are tested.

	Task	Description of Balance	Possible	Score
1	Sitting Balance	Leans or slides in chair	0	
		Steady, safe	1	
2	Arises	Unable without help	0	
		Able, uses arms to help	1	
		Able without using arms	2	
3	Attempts to arise	Unable without help	0	
		Able, requires > 1 attempt	1	
		Able to rise, 1 attempt	2	
4	Immediate standing balance (first 5 seconds)	Unsteady (swaggers, moves feet, trunk sway)	0	
		Steady but uses walker or other support	1	
		Steady without walker or other support	2	
5	Standing Balance	Unsteady	0	
		Steady but wide stance (medial heels > 4 inches apart) and uses cane or other support	1	
		Narrow stance without support	2	
6	Nudged (subject at max position with feet as close together as possible, examiner pushes lightly on subject's sternum with palm of hand 3 times)	Begins to fall	0	
		Staggers, grabs, catches self	1	
		Steady	2	
7	Eyes closed (at maximum position #6)	Unsteady	0	
		Steady	1	
8	Turning 360 degrees	Discontinuous steps	0	
		Continuous steps	1	
		Unsteady (grabs, swaggers)	0	
		Steady	1	
9	Sitting Down	Unsafe (misjudged distance, falls into chair)	0	
		Uses arms or not a smooth motion	1	
		Safe, smooth motion	2	

0 = highest level of impairment
2 = independent

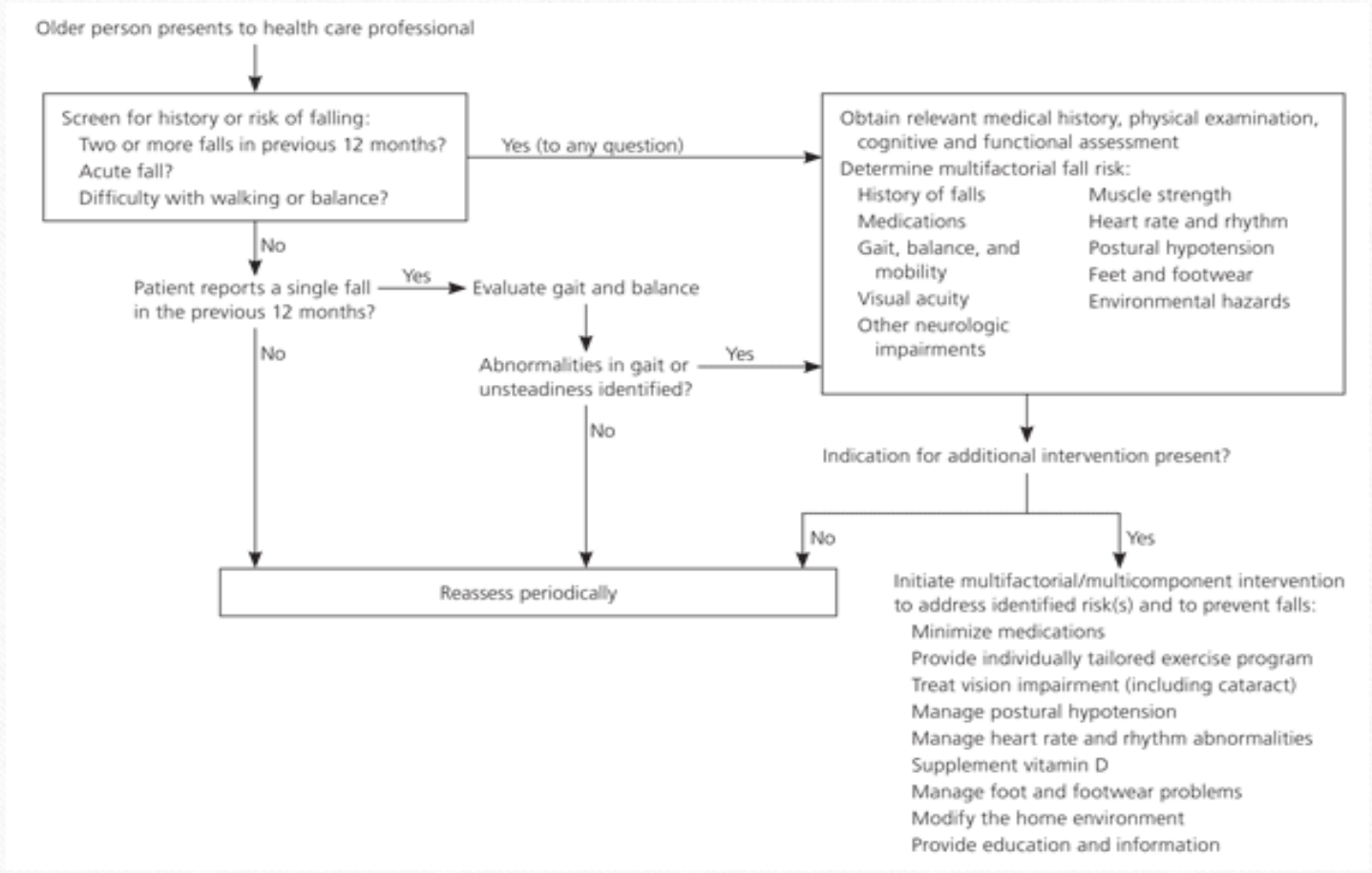
Total Balance Score (out of 16) =

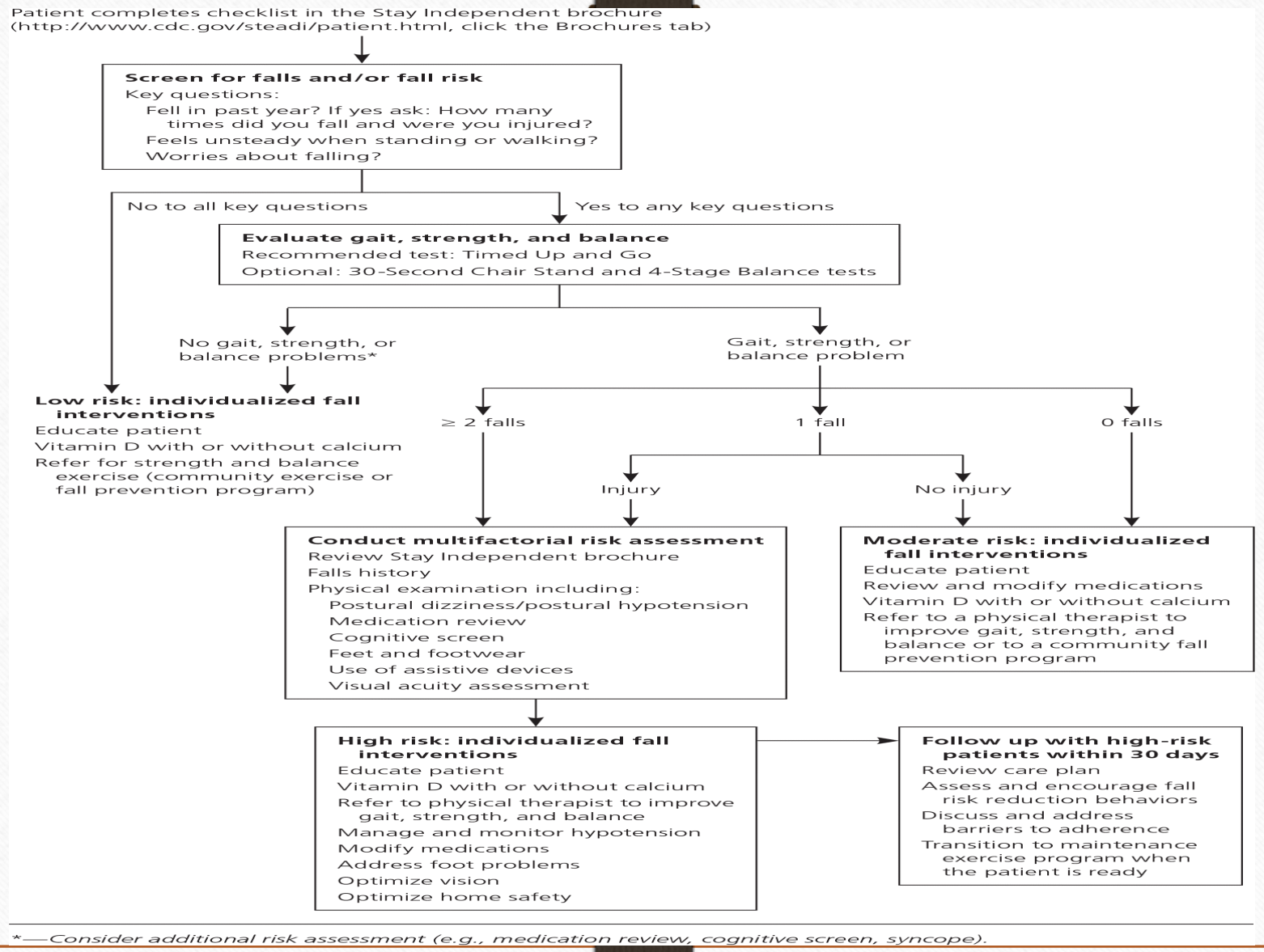
Performance-Oriented Mobility Assessment

- Greater than or equal to 24 = Low fall risk
- 19-23 = Moderate Fall Risk
- 18 or less = High Fall Risk

Three Question Risk Assessment

- Have you fallen in the past year?
- Do you feel unsteady when standing or walking?
- Do you worry about falling?


Older person presents to health care professional
Screen for history or risk of falling:
Two or more falls in previous 12 months?
Acute fall?
Difficulty with walking or balance?
Yes (to any question)
Obtain relevant medical history, physical examination, cognitive and functional assessment
Determine multifactorial fall risk:
History of falls
Medications
Gait, balance, and mobility
Visual acuity
Other neurologic impairments
Muscle strength
Heart rate and rhythm
Postural hypotension
Feet and footwear
Environmental hazards
No
Patient reports a single fall in the previous 12 months?
Yes
Evaluate gait and balance
No
Abnormalities in gait or unsteadiness identified?
Yes
No
Indication for additional intervention present?
No
Yes
Reassess periodically
Initiate multifactorial/multicomponent intervention to address identified risk(s) and to prevent falls:
Minimize medications
Provide individually tailored exercise program
Treat vision impairment (including cataract)
Manage postural hypotension
Manage heart rate and rhythm abnormalities
Supplement vitamin D
Manage foot and footwear problems
Modify the home environment
Provide education and information


Patient completes checklist in the Stay Independent brochure (http://www.cdc.gov/steadi/patient.html, click the Brochures tab)
Screen for falls and/or fall risk
Key questions:
Fell in past year? If yes ask: How many times did you fall and were you injured?
Feels unsteady when standing or walking?
Worries about falling?
No to all key questions
Yes to any key questions
Evaluate gait, strength, and balance
Recommended test: Timed Up and Go
Optional: 30-Second Chair Stand and 4-Stage Balance tests
No gait, strength, or balance problems*
Gait, strength, or balance problem
Low risk: individualized fall interventions
Educate patient
Vitamin D with or without calcium
Refer for strength and balance exercise (community exercise or fall prevention program)
≥ 2 falls
1 fall
0 falls
Injury
No injury
Conduct multifactorial risk assessment
Review Stay Independent brochure
Falls history
Physical examination including:
Postural dizziness/postural hypotension
Medication review
Cognitive screen
Feet and footwear
Use of assistive devices
Visual acuity assessment
Moderate risk: individualized fall interventions
Educate patient
Review and modify medications
Vitamin D with or without calcium
Refer to a physical therapist to improve gait, strength, and balance or to a community fall prevention program
High risk: individualized fall interventions
Educate patient
Vitamin D with or without calcium
Refer to physical therapist to improve gait, strength, and balance
Manage and monitor hypotension
Modify medications
Address foot problems
Optimize vision
Optimize home safety
Follow up with high-risk patients within 30 days
Review care plan
Assess and encourage fall risk reduction behaviors
Discuss and address barriers to adherence
Transition to maintenance exercise program when the patient is ready
*—Consider additional risk assessment (e.g., medication review, cognitive screen, syncope).

Medications and Falls

- BENZODIAZEPINES, OPIATES AND HYPNOTICS
  - Beer's Criteria List

Medications That Increase Risk of Falls

- Anticonvulsants
- Anti-Depressants (TCAs and SSRIs)
- Antihypertensives
- Antiparkinsonian Medications
- Antipsychotics (typical and atypical)
- Benzodiazepines (short-and long lasting)
- Digoxin
- Diuretics
- Laxatives
- Opioids
- Hypnotics and Sedatives
- NSAIDs
- Cholinesterase Inhibitors

Assessing Risk Factors

- Comorbities
  - Osteoporosis
  - Depression
  - Dementia
  - Incontinence
- Feet or Footwear Issues
  - Look for foot deformities
  - Look for sensation deficit(s)
  - Identify foot pain, if any

Assessing Risk Factors

- Vitamin Deficiency
  - Ask about dietary intake of vitamin D
  - Use of vitamin D, both prescription and OTC supplements
  - Sun Exposure
- Orthostatic Hypotension
  - Check blood pressure after patient has been in supine position for 5 minutes
  - Have patient stand and re-checked blood pressure in the position within 3 minutes

Assessing Risk Factors

- Vision Issues
  - Use Snellen chart to assess acuity
  - Ask patient if they wear bifocals
- Medications that increase fall risk
  - Review medication list
- Functional Status such as ability to AODL
- Psychiatric
  - Patient's perception of their functional status and fear of falling
- Home Environment
  - Throw rugs
  - Bars for toilet and bathtub
  - Loose Cords (both electric and on blinds)

Physical Exam

- Labs – CMP, Urinalysis, 25-Hydroxy Vitamin D, CBC
- DEXA Scan
- Postural Pressure and Pulse
- Cardiac Exam (including assessing for carotid sinus hypersentivity)
- Neurological Exam (CN II-XII, Sensation, Reflexes, proprioception, tests for cortical, extrapyramidal and cerebellar function)
- Snellen Eye Test
- Chest Xray and EKG if fall is acute
- Muscle strength, gait and balance
- Mini-Mental Status Exam (60% have falls due to cognitive deficit or dementia)
- Feet and footwear exam

Get Up and Go Test

- https://youtu.be/tNay64Mab78?si=hPQrjfQiTsaVRbwF

Get Up and Go Test

- Get Up and Go Test

- 60 to 69 years old should be able to do the test in 9 seconds
- 70 to 79 years old should be able to do the test in 10.2 seconds
- 80 to 99 years od should be able to do the test in 12.7 seconds

30-Second Chair Stand Test

- https://youtu.be/qkV0UvjXgcs?si=akH2F0ZDwT7Q5GBs

30-Second Chair Stand Test

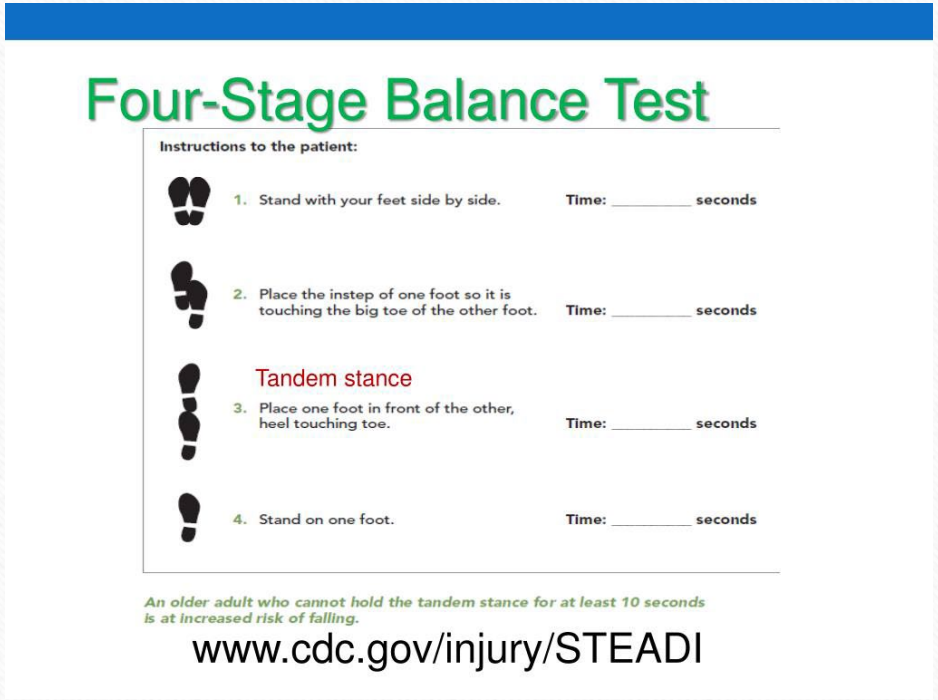
Chair Stand
Below Average Scores

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

4-Stage Balance Test

- https://youtu.be/VUq6IgQAVJM?si=SvQG_AVFfyRTFaaq

4-Stage Balance Test



- Patient should be able to hold each position for at least 10 seconds
- Stop test if patient has to grab hold of something for balance or if feet move

Single Factor Intervention

- Exercise
  - Should have a balance component
  - Should have a gait component
  - Should have strength-training component
  - Should occur for 30 minutes 3 times a week for at least 12 weeks
  - USPSTF found this to have moderate benefit in preventing falls for geriatric patients at increased risk of falling (B Recommendation)

Multifactorial Interventions

- AGS recommends this for those with 2 or more falls, gait and balance problems and any indication found on physical exam
- USPSTF found adequate evidence that multifactorial intervention reduce risk falls by a small amount (C recommendation)

Multifactorial Interventions

- Medication
  - Reduce, change or stop medications that increase fall risk
  - Labs evaluating for digoxin or anti-convulsant toxicities
  - Polypharmacy is defined as 4 or more medicines
- Vision Impairment
  - Refer to optometrist or ophthalmologist for complete eye and vision exam
  - Recommend cataract surgery as soon as possible
  - Recommend wearing single distance lenses for walking outside

Multifactorial Interventions

- Postural Hypertension
  - Evaluate for Dehydration
  - BUN/Cr ratio
  - Capillary refill
  - Oral Mucosa
  - Skin Tenting
- Abnormal Heart and Arrhythmias
- Treat underlying cause
- Adjust medications if needed

Multifactorial Interventions

- Abnormal Heart and Arrhythmias
  - Bradyarrhythmia (Sick Sinus Syndrome, AV Block) and tachyarrhythmia
  - Bradyarrhythmias can be treated with cardiac pacing
  - Vasovagal
  - Carotid Sinus Hypersensitivity
  - Refer to Cardiology/Electrophysiologist

Multifactorial Interventions

- Vitamin D Supplementation
  - GSA recommend Vitamin D 800 IU daily recommended for all adults over 65 with vitamin D Deficiency at risk for falls
  - USPSTF finds with moderate certainty that vitamin D and/or calcium supplementation has no benefit for preventing falls in older adults
  - USPSTF found insufficient evidence to give Vitamin D supplementation to men or postmenopausal women with a dose greater than 400 IU daily
  - USPSTF found adequate evidence that harms of vitamin D supplementation are small to moderate (including increased risk of kidney stones with added calcium supplementation)

Multifactorial Interventions

- Foot and Footwear Problems
  - Assess for bunions, toe deformities, ulcers, nail deformities, foot drop and foot positions
- Shoe Evaluation
  - High Heels
  - Worn soles
  - Untied or unbuckled shoes
  - Recommend low heels, insoles and/or correct fitting shoes
  - Recommend shoes that allow for high surface contact with the ground

Home Hazards

- Order Home Health for evaluation
- Refer to Physical Therapy
- Refer to Occupational Therapy

Multidisciplinary Team

Modifications Patients Can Make At Home

- Use steady step stools with railings to hold
- Non-slip rubber mats in the bathtub
- Handrails in bathtub and near toilet
- Personal Emergency Response System
- Turn on lights in hallways and rooms
- Use assistive devices

Modifications Patients Can Make At Home

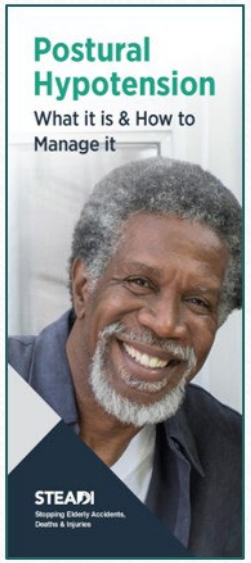
- Remove rugs or put double sided tape on the bottom
- Remove clutter and objects that may trip them
- Secure cords and wires
- Handrails securely attached to both sides of the wall
- Move items that are hard to reach to lower shelves

Provider Resources For Fall Assessment and Prevention

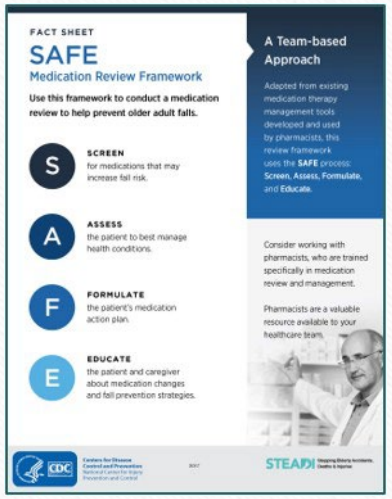
- www.cdc.gov/steadi

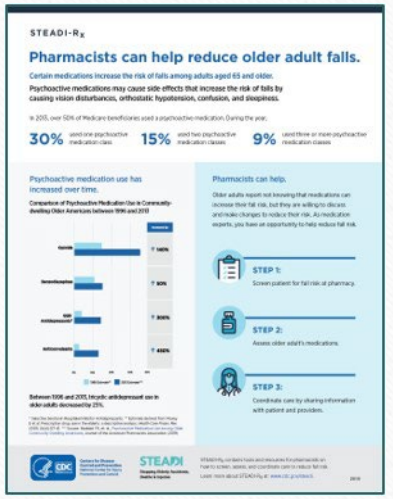
- www.cdc.gov/steadi/training.html
- (for CME Education)

Patient Resources



Patient Resources





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Questions

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Thank You