MedStar Health

The Assessment and Prevention of Falls in Older People

Clinical Practice Guideline MedStar Health

"These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient's primary care provider, in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication but should be used with the clear understanding that continued research may result in new knowledge and recommendations".

General Principles:

Falls are among the most common and preventable causes of morbidity and mortality for older adults around the world. Each year, 30 to 40 percent of community-dwelling adults over 65 experience a fall, with even higher rates for nursing home residents and hospitalized patients. The incidence of falls steadily increases from middle age, peaking among those older than 80. Between 20 and 30 percent of older adults who fall—approximately 800,000 individuals annually—sustain serious injuries like hip fractures and head trauma. Recovery from falls is often hindered by diminished quality of life due to restricted mobility and functional decline, and it serves as a predictor for nursing home placement. The fear of falling, or "post-fall anxiety syndrome," may impact 50% of those who suffer hip fractures and can lead to activity restrictions in up to three-fourths of patients. The US Centers for Disease Control and Prevention (CDC) estimates that in the US, an older adult dies from a fall every 20 minutes. Healthcare costs associated with falls in the US exceed $50 billion each year, comprising 4.4% of Medicare hospital expenditures, 5.7% of costs related to physicians and other health professionals, and 11.8% of spending for home health services, long-term care facilities, and durable medical equipment. This clinical practice guideline aims to support primary care clinicians by offering an evidence-based analytical framework for assessing and preventing falls in community-dwelling adults over 65. It is not designed to replace clinical judgment or to create a protocol applicable to all patients.

Initial Screen: Ask all older adults and/or their caregivers about the occurrence of falls during the past year.

Recommendations:

1. **History of or propensity for falling:**
   a. If the older adult and/or their caregiver reports A SINGLE FALL in the past year, assess their gait and balance using a standardized tool such as the "Get Up and Go Test" or "5 Times Sit to Stand" described below.
   b. A Comprehensive Falls Risk Assessment is recommended if the patient or their caregiver reports:
      - FOLLOWING A RECENT FALL FOR EVALUATION.
      - RECURRENT FALLS in the past one year.
      - Was deemed a *falls risk* (e.g., required to don yellow socks) during a recent hospitalization; or,
      - At any visit, when the patient is noted to have a new onset unsteady gait or is using an assistive ambulatory device.

2. **Comprehensive Falls Risk Assessment**
   a. A review of the circumstances surrounding the fall(s), including the location of fall (indoors or out), activity prior to fall, loss of consciousness or other prodromal symptoms, use of walking aids (e.g., cane, walker) and/or protective devices (e.g., hip protectors, helmet), environmental conditions (e.g., snow, ice), and injuries that resulted from the fall. Are these Accidental ("Could happen to anyone."), Anticipated ("It was just a matter of time…"), or related to a Condition ("Whenever I stand up too fast, I get dizzy.")?
   b. Cardiovascular examination including postural changes in HR and BP.

c. Medication optimization review with a focus on psychoactive medications and polypharmacy. Medication regimens should be reviewed for high fall risk medications per the AHRQ medication fall risk scoring algorithm and recent medication changes when compared against home medication use. Refer to appendix A for the AHRQ high fall risk medication scoring.
d. Assessment of the patient's reported functional ability and fear related to falling.
e. Assessment for cognitive impairment and a focused neurological examination.
f. Assessment for urinary urgency or incontinence.
g. Assessment for visual impairment, especially cataracts and peripheral vision.

3. Recommended Interventions

a. Follow-up on clinical findings and optimize the therapeutic regimen. Medication review should focus on appropriate medication dosing based on renal or hepatic function, newly started high fall risk medications, dose changes to a high fall risk medication, or frequent use of as-needed high fall risk medications in evaluating the cumulative medication contribution to patient fall risk.
b. Appropriate referrals based on proposed specialty interventions.
c. Physical Therapy /Occupational Therapy Evaluation, as appropriate, for strength and balance assessment, assessment of home hazards, and education and compensation techniques to improve safety in their environment.

4. Patient Specific Considerations

a. Consider osteoporosis screening, along with calcium and Vitamin D deficiency. Vitamin D supplements of at least 800 IU per day should be provided to older persons *with proven vitamin D deficiency.* Calcium supplementation with 500-600 mg twice daily of calcium citrate or carbonate should be considered for older adults with proven calcium deficiency.
b. Identification of foot problems and appropriate treatment.
c. Older people should be advised that walking with properly fitting shoes of low heel height and high surface contact area may reduce the risk of falls.
d. Appropriate use of walking aids.
e. Improving physical mobility: exercise programs (e.g., Tai Chi, Yoga), balance, strength, and gait training.
f. Home evaluation and modification of environmental hazards.
g. Continence promotion and toileting programs.
h. Educating direct caregivers, who assess fall risk and initiate individualized interventions, is an important component of fall reduction. Available MedStar resources to determine social needs are available within MedConnect under the Ad Hoc tab > Forms > Social Needs Screening Questionnaire or at: https://socialneeds.medstarhealth.org/.

TESTS and TOOLS to Assess Fall Risk:

1. 'Get Up and Go' test or Timed Up and Go (TUG)

The 'Get Up and Go' test is a composite measure of functional mobility. The test is performed by observing the patient rise from a seated position, walk 10 feet using usual assistive devices, turn, return to the chair, and sit back down. While the time it takes for a patient to perform this test can be measured, this information has not been found to be helpful in community-dwelling elderly. A meta-analysis published in 2013 of 53 studies with 12,832 participants found that the mean difference between healthy independent living fallers vs non-fallers was 0.63 seconds but was 3.59 seconds for those living in institutional settings. The authors concluded that TUG is not useful in healthy, high-functioning older people but more valuable in less healthy, lower-functioning older people. Overall, the predictive ability and diagnostic accuracy of TUG are at best moderate.

Observing how a person performs the task rather than measuring the time it takes to perform the task may be more useful. In general, > 13.5 secs is considered to be at increased risk of falls.
https://www.youtube.com/watch?v=tNay64Mab78

2. **30-Second Chair Stand Test (30CST)**
   The 30-Second Chair Stand Test is a functional assessment tool used to measure lower body strength in older adults. During the test, the participant is asked to sit in a standard chair with their arm crossed over their chest and then stand up and sit down as many times as possible within 30 seconds. The total number o completed stands is recorded as the score. This test is widely used due to its simplicity and reliability. It has been validated as a measure of lower body strength, which is crucial for maintaining functional independence in older adults. Studies have shown that the 30-s CST has good test-retest reliability and criterion-related validity when compared to other measures of lower body strength, such as the maximum leg-press test.

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

   A below average score indicates a risk for falls.
   https://www.youtube.com/watch?v=qkV0UvjXgcs

3. **Five Times Sit to Stand (5T-STS)**
   The Five Time Sit-to-Stand Test or 5T-STS is a functional performance measure used to assess lower limb strength, balance, and functional mobility. It is widely used in various populations, including those with balance disorders, Parkinson's disease, stroke, and older adults, to predict mobility and fall risk. During the 5T-STS, the patient is asked to start in a seated position with their arms crossed. Then the patient is asked to stand up and sit down five times in a row as fast as they can safely. The patient should ascend and descend from a chair that is approximately 17 inches tall. The test is scored on the patient's age and sex, and the time it takes the patient to perform the test. This test has been studied for several decades in relation to fall risk, so specific cut-off scores may depend on the source that is cited.

   Normative data: anyone that falls outside of this time is a risk for falls (Bohannon et al, 2010; Lusardi et al, 2003):

20-29 years	6.0±1.4 sec
30-39 years	6.1±1.4 sec
40-49 years	7.6±1.8 sec
50-59 years	7.7±2.6 sec
60-69 years	8.4±0.0 sec (male), 12.7±1.8 sec (female)
70-79 years	11.6±3.4 sec (male), 13.0±4.8 sec (female)
80-89 years	16.7±4.5 sec (male), 17.2±5.5 sec (female)
90+ years	19.5±2.3 sec (male), 22.9±9.6 sec (female)

   https://www.youtube.com/watch?v=_jPl-IuRJ5A&t=1s

4. **4-Stage Balance Test**
   The 4-Stage Balance Test is a clinical assessment tool used to evaluate static balance in older adults. The test consists of four progressively challenging standing positions: feet adjacent, semi-tandem stance, tandem stance, and on one foot. Each position is held for 10 seconds, and the test is designed to identify balance deficits by increasing the difficulty of the stance. The test is particularly useful for assessing fall risks in older adults.
   https://www.youtube.com/watch?v=VUq6IgQAVJM

Risk factors for Falls: Risk factors for falls can be considered as intrinsic to the individual (some of which are modifiable) or extrinsic (and therefore more easily modifiable).

Intrinsic and Extrinsic Risk Factors for Falls (Adapted from In the Clinic: Falls Prevention in Community-Dwelling Older Adults 2018)
Intrinsic
Ocular (decreased visual acuity, macular degeneration, glaucoma, cataracts, retinopathy, reduced depth perception)
Cardiovascular (bradycardia, tachyarrhythmias, orthostatic hypotension, decompensated heart failure)
Neurologic (cognitive impairment and dementia, Parkinson's disease, or other movement disorders, CVA, peripheral neuropathy
Urologic (any type of incontinence, nocturia)
Psychological (insomnia, sleep deprivation, depression)
Musculoskeletal (OA or inflammatory arthritis, pain, leg weakness, reduced flexibility)
Vestibular (Vestibular dysfunction due to BPV, Meniere's Disease, barotrauma)
Extrinsic
Medications (anticholinergics, antidepressants, antipsychotics, sedative-hypnotics, benzodiazepines, non-benzodiazepine sedatives, opiates, anti-hypertensives, anti-arrhythmics, anticonvulsants, or the use of more than 4 medications). In general, medications that act on the central nervous system increase the risk of fall by about 50%. Anti-hypertensives increase falls risk by ~ 25%, especially following an increase in dose. Patients receiving high fall risk medications with an Agency for Healthcare Research and Quality (AHRQ) score ≥ 6 are at a greater risk for falls and falls with injury. Refer to appendix A for the AHRQ high fall risk medication scoring.
Footwear (backless shoes and slippers, high heels, shoes lacking dorsum, arch or heel supports; shoes with heavy soles or a narrow toe box
Environment (wet or slippery surfaces, lack of grab bars, uneven flooring, floor rugs, poor lighting, lack of handrails for steps, or cords or other walkway hazards

Interventions for Lowering Fall Risk by Site of Care

Home
Muscle strengthening or balance training prescribed by clinician Tai Chi Home-hazard assessment prescribed by those with history of falls Multidisciplinary, multifactorial health and environmental risk-factor screening or intervention for: • Unselected community-dwelling older adults • Older adults with a history of falling • Older adults selected because of known risk factors Withdrawal of psychotropic medications Vitamin D supplementation at ≥800 IU/d in persons with vitamin D deficiency First cataract surgery, when indicated
Hospital
Many risk assessments have reasonable sensitivity and specificity to be of potential value in targeting high-risk patients. Multifactorial interventions that target an individual's greatest risk factors for falls, including a plan that uses health information technology, has been effective in reducing falls.
Nursing Home
No proven interventions have been reported other than vitamin D supplementation. Reasonable to assume all nursing-home residents are at high risk of falls and to target resident's most important individual risk factors, using an interprofessional team. Vitamin D supplementation at ≥800 IU/d for residents independent in transfers at risk of falls (SOE=A) Exercise programs may reduce risk of falls

Interventions and Evidence Ratings: The relative effectiveness of interventions varies, with exercise having the strongest evidence of benefit in reducing falls and fall-related injuries. In addition, different guideline-writing organizations disagree about the effectiveness of some interventions (particularly vitamin D supplementation in patients without known vitamin D deficiency or osteoporosis).

Interventions for Falls Prevention and Their Evidence Ratings (Adapted from: In the Clinic: Falls Prevention in Community-Dwelling Older Adults)		
Intervention	**USPSTF (2024)**	**AGS/BGS (2011)**
Strength and balance exercise, gait training	B	A
Tai Chi	B	A
Home modification	I*	A
Medication—Reduction in psychoactive medications	I*	B
Medication—Reduction in number or dose	I*	B
Postural hypotension management	Not addressed	C
Vitamin D supplementation for fall prevention	D	A only for *proven vit D deficiency* / B
First eye cataract surgery	Not addressed	B
Vision screening and management	Not addressed	I
Hearing screening and management	Not addressed	Not addressed
Foot/shoe screening and management	Not addressed	C
Education alone	I*	D
Cardiac pacing for carotid sinus hypersensitivity	Not addressed	B
Assistive device, alarms, or hip protectors	Not addressed	C
Multifactorial interventions	C	A

USPSTF (United States Preventive Services Task Force) recommendations: A=recommended with high certainty of benefit; B=recommended with moderate certainty of benefit; C=selectively offer based on professional judgment and patient preferences; D=recommended against based on moderate or high certainty of no benefit or that harms outweigh the benefit; I=insufficient evidence; I*=evidence report finding of insufficient evidence/not part of summary recommendation. AGS/BGS (American Geriatrics Society/British Geriatrics Society): A= strongly recommended; B=recommended; C=no recommendation for or against; D=recommended against; I=insufficient evidence

Considerations for Recurrent Fallers

A small number of older adults fall repeatedly despite interventions. These patients generally have nonmodifiable risk factors that place them at particularly high risk, including Parkinson's disease and dementia. Every effort should be made for these patients to reduce modifiable risk factors, such as decreasing medications associated with falls, managing pain, and assessing environmental hazards. As with all fallers, it is important to obtain a history of the events surrounding the fall to rule out syncope, seizures, and other less common medical conditions. These patients often seek medical attention due to their falls, and frequently, medical providers suggest transitioning to a nursing home or an environment with more intensive supervision. Patients who can comprehend the risks and alternatives and express their desire to remain independent have the right to do so. In such cases, a direct discussion of goals of care, with or without a palliative care consult, may be beneficial. Additionally, various home safety products, such as push-button alarms and emergency activation devices, may be utilized by some patients to prevent prolonged lying on the ground.

Appendix A

Agency for Healthcare Research and Quality (AHRQ) Medication Fall Risk Score

Medication Fall Risk Score

Point Value (Risk Level)	**Medication Formulary Class**	**Associated Risk for Fall Contribution**
3 (High)	Analgesics including opiates and NSAIDs, antipsychotics, anticonvulsants, benzodiazepines, non-benzodiazepine sedatives	Sedation, dizziness, postural disturbances, altered gait and balance, impaired cognition
2 (Medium)	Antihypertensives, cardiac drugs, antiarrhythmics, antidepressants	Induced orthostasis, impaired cerebral perfusion, poor health status
1 (Low)	Diuretics	Increased ambulation, induced orthostasis
Score ≥ 6		**Higher risk for fall; evaluate patient and review medication therapy to see if alternative therapies may be appropriate**

Educational Resources for Patients

Falls Free Checkup (National Council on Aging)
https://www.ncoa.org/tools/falls-free-checkup/

What YOU Can Do to Prevent Falls (Brochure- CDC)
https://www.cdc.gov/steadi/pdf/STEADI-Brochure-WhatYouCanDo-508.pdf

Check For Safety: A Home Fall Prevention Checklist for Older Adults (Brochure- CDC)
https://www.cdc.gov/steadi/pdf/STEADI-Brochure-CheckForSafety-508.pdf

Hypotension brochure (Brochure – CDC)
https://www.cdc.gov/steadi/pdf/STEADI-Brochure-Postural-Hypotension-508.pdf

Falls Prevention Center of Excellence, (online resources). Stop Falls.org
http://stopfalls.org/

Chair Rise Exercise (Brochure CDC)
https://www.cdc.gov/steadi/pdf/STEADI-Brochure-ChairRiseEx-508.pdf

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