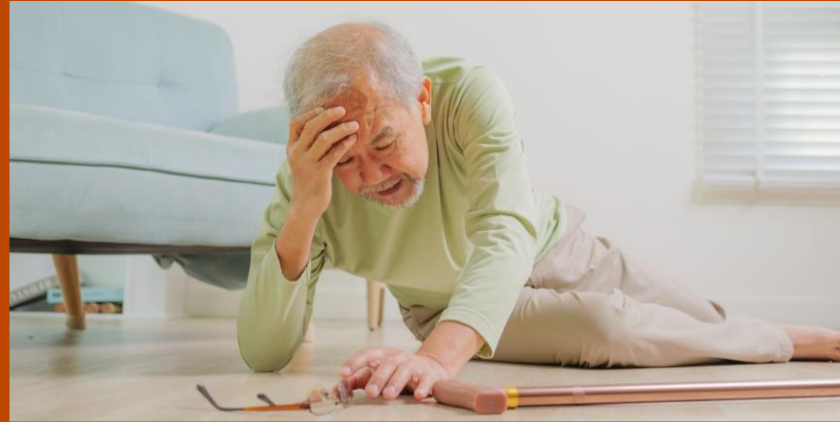

Geriatric Fall Prevention:

Strategies for Emergency Clinicians

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Disclosures

- No relevant conflicts of interest to disclose.

UT Health
San Antonio

Objectives

- Understand fall-related morbidity and mortality
- Identify key components of the CDC’s STEADI algorithm and their application in fall prevention
- Analyze evidence supporting the adaptation of STEADI for emergency care settings
- Describe local resources that emergency clinicians can integrate into geriatric fall prevention referral pathways
- Questions?

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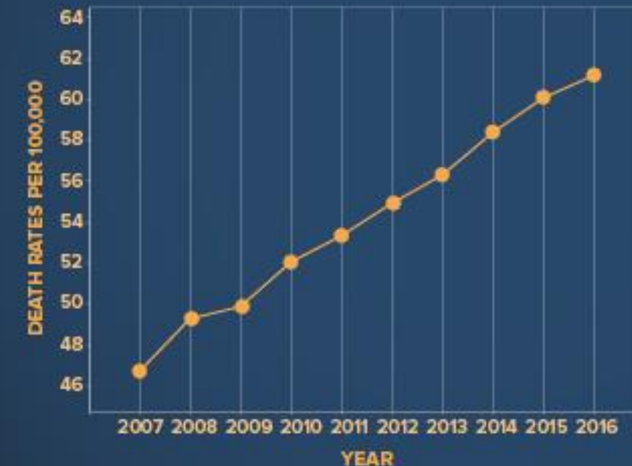
Leading Causes of Death

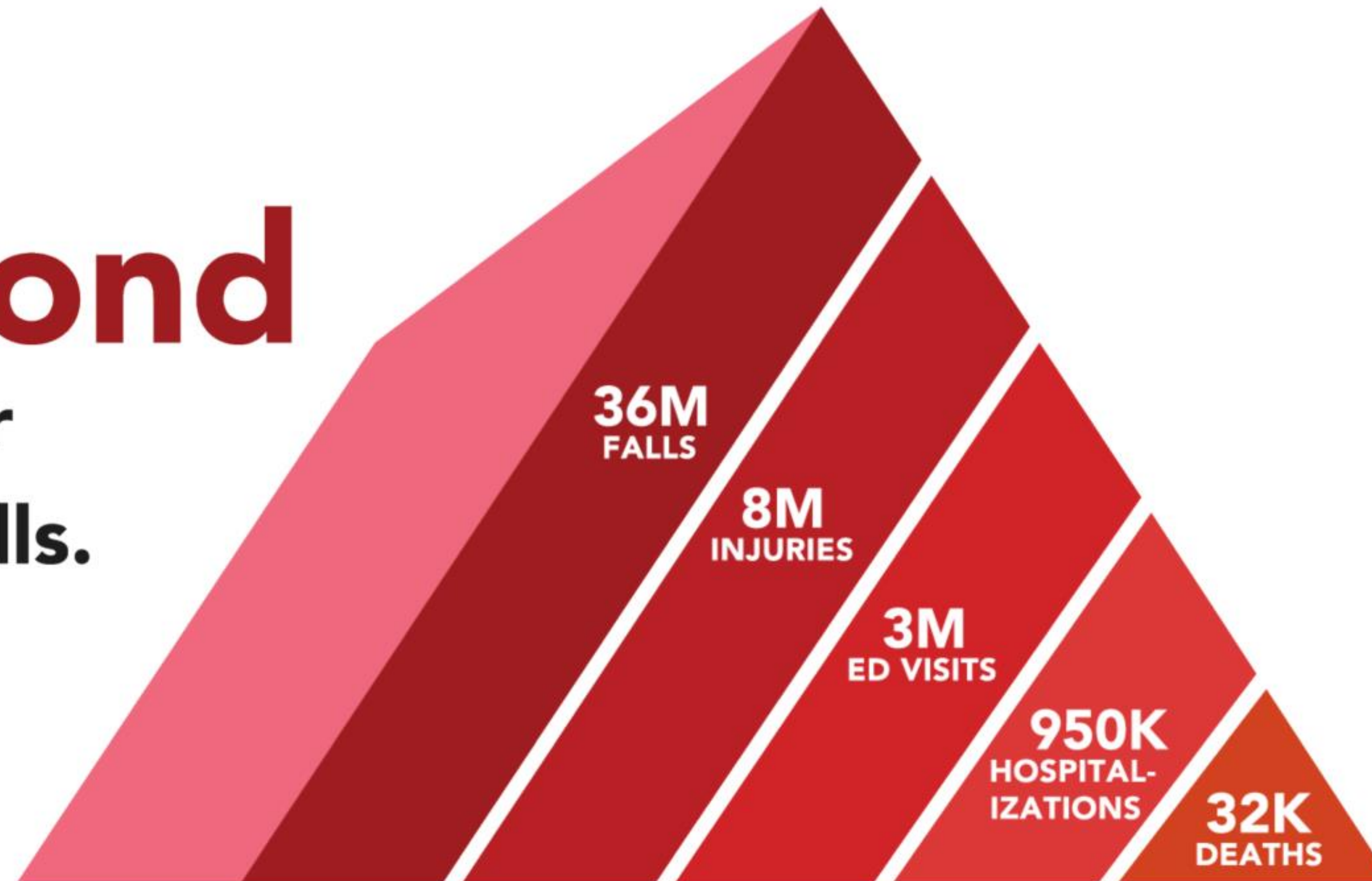
Top 10 Causes of Death Among Older Adults									
1	2	3	4	5	6	7	8	9	10
Heart Disease	Cancer	Chronic Lower Respiratory Disease	Stroke	Alzheimer's Disease	Diabetes	Unintentional Injury	Influenza & Pneumonia	Kidney Disease	Parkinson's Disease

Top 3 Causes of Unintentional Injury Deaths		
1	2	3
Fall	Motor Vehicle (Traffic-related)	Unspecified



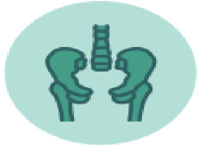
Data source: National Vital Statistics System

Falls Are Common



Data sources: National Vital Statistics System, National Electronic Injury Surveillance System-All Injury Program, and Behavioral Risk Factor Surveillance System.

Consequences of Falls Among Older Adults



More than 95% of hip fractures are due to falls

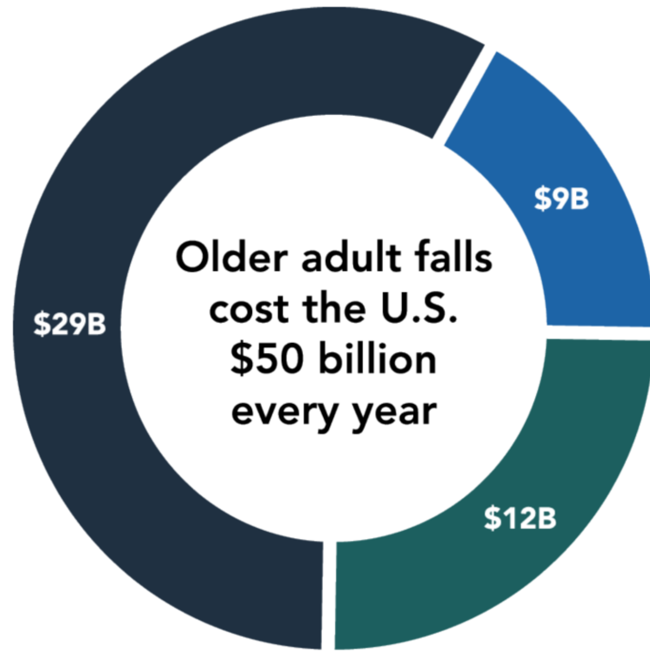
Falls are the leading cause of traumatic brain injuries

Falls are fall injuries increase the risk of nursing home placement

Fall death rates increased about 30% between 2009 and 2018

Falls can lead to devastating outcomes

Falls Are Costly



Medicare: $29 billion

Medicaid: $9 billion

Private/Out-of-Pocket: $12 billion

Florence C., et al. (2018). Medical costs of fatal and nonfatal falls in older adults. *Journal of the American Geriatrics Society, 66(4), 693-698.*

Table 2 Non-fatal falls-attributable fraction of expenditures and associated healthcare spending according to payer: 2017, 2019 and 2021, Medicare Current Beneficiary Survey and 2020 National Health Expenditure Accounts, USA

Payer	Attributable fraction, % (95% CI)	2020 Healthcare spending, billion $ (95% CI)
Medicare	9.0 (5.3 to 12.8)	53.3 (31.1 to 75.6)
Medicaid	3.1 (−11.0 to 17.2)	3.5 (−12.2 to 19.2)
Private/out of pocket/other	6.8 (3.8 to 9.7)	23.2 (13.2 to 33.2)
Total		80.0 (32.1 to 128.0)

Table 3 Non-fatal falls-attributable fraction of expenditures and associated healthcare spending according to type of service: 2017, 2019 and 2021 Medicare Current Beneficiary Survey and 2020 National Health Expenditure Accounts, USA

Service type	Attributable fraction, % (95% CI)	Healthcare spending, billion $ (95% CI)
Hospital	14.4 (9.1 to 19.6)	50.8 (32.3 to 69.3)
Physician/other provider	7.3 (4.7 to 9.9)	19.0 (12.2 to 25.7)
Dental	4.2 (0.4 to 8.0)	1.4 (0.1 to 2.7)
Prescription drugs	0.2 (−5.3 to 5.6)	0.2 (−6.4 to 6.8)
Other*	19.7 (12.8 to 26.7)	33.2 (38.5 to 80.3)
Total		104.6 (76.8 to 184.8)

*Includes other health, residential and personal care; home healthcare; durable medical equipment; other non-durable medical product.

Haddad YK, Miller GF, Kakara R, et al. Healthcare spending for non-fatal falls among older adults, USA. Inj Prev. 2024;30(4):272-276. Published 2024 Jul 19. doi:10.1136/ip-2023-045023

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EMS Lift Assist Morbidity and Mortality

- Retrospective review of CY-2013 data from London, Ontario, Canada
- Inclusion: charted as "lift assist" by EMS (no treatment or transport)
- Reviewed EMS and hospital records within 14 days of index "lift assist"
- 804/ 42,055 (1.9%) EMS Lift Assist calls
  - 414 individuals responsible for total calls
  - 28% **had more than 1 Lift Assist call (median =** 3)
  - Mean age 74.8, 55% Female

Leggatt L, Van Aarsen K, Columbus M, et al. Morbidity and Mortality Associated with Prehospital "Lift-assist" Calls. *Prehosp Emerg Care*. 2017;21(5):556-562. doi:10.1080/10903127.2017.1308607

UT Health San Antonio

EMS Lift Assist Morbidity and Mortality

- Within 14 days of index lift assist (N=804)
  - **21% - ED visits**
  - **11.6% - Hospital Admission**
  - **1.1% - Death**
- Hospitalized Patients
  - Average LOS 7 days
  - #1 Primary Dx = Infection (33%)
- Disposition:
  - 23.7% Home, without supports
  - 45.2% Home, with supports
  - 19.4% Long-term care (SNF)
  - 11 died (11.8% of admits, 1% of all lift assist calls)

TABLE 2. Discharge diagnosis sub-type of patients admitted to hospital within 14 days of LA call

Discharge Diagnosis	Number (%)
Infection	31 (33.3)
Fall	11 (11.8)
Cancer complication or new diagnosis of cancer	9 (9.7)
Fracture	8 (8.6)
Miscellaneous	34 (36.6)
Total	93

Leggatt L, Van Aarsen K, Columbus M, et al. Morbidity and Mortality Associated with Prehospital "Lift-assist" Calls. *Prehosp Emerg Care*. 2017;21(5):556-562. doi:10.1080/10903127.2017.1308607

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Emergency Department Fall Patients: Two Studies

- Retrospective review of 350 patients (age 65+) discharged after fall (Lieu, 2015)
  - Adverse event: recurrent fall or ED visit, hospitalization, death
- Within 7 days: 7.7%, Within 30 days: 21.4%, Within 6 months: 50.3%
  - Within 6 months: 22.6% recurrent fall, 42.6% ED revisit, 31.1% hospitalization, 2.6% death

- Retrospective review of 21,340 pts (age 65+) discharged after fall (Sri-On, 2017)
  - Revisits: 2% at 3 days to 25% at 1 year
  - Deaths: 1.2% at 3 days to 15% at 1 year
  - Within 1 year: 36% ED revisit or death

Liu SW, Obermeyer Z, Chang Y, Shankar KN. Frequency of ED revisits and death among older adults after a fall. *Am J Emerg Med*. 2015;33(8):1012-1018. doi:10.1016/j.ajem.2015.04.023
Sri-On J, Tirrell GP, Bean JF, Lipsitz LA, Liu SW. Revisit, Subsequent Hospitalization, Recurrent Fall, and Death Within 6 Months After a Fall Among Elderly Emergency Department Patients. *Ann Emerg Med*. 2017;70(4):516-521.e2. doi:10.1016/j.annemergmed.2017.05.023

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Falls Are Preventable

The Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative was developed by the U.S. Centers for Disease Control and Prevention (CDC)

- STEADI is based on the American and British Geriatrics Societies' Clinical Practice Guideline for Prevention of Falls in Older Persons and designed with input from healthcare providers

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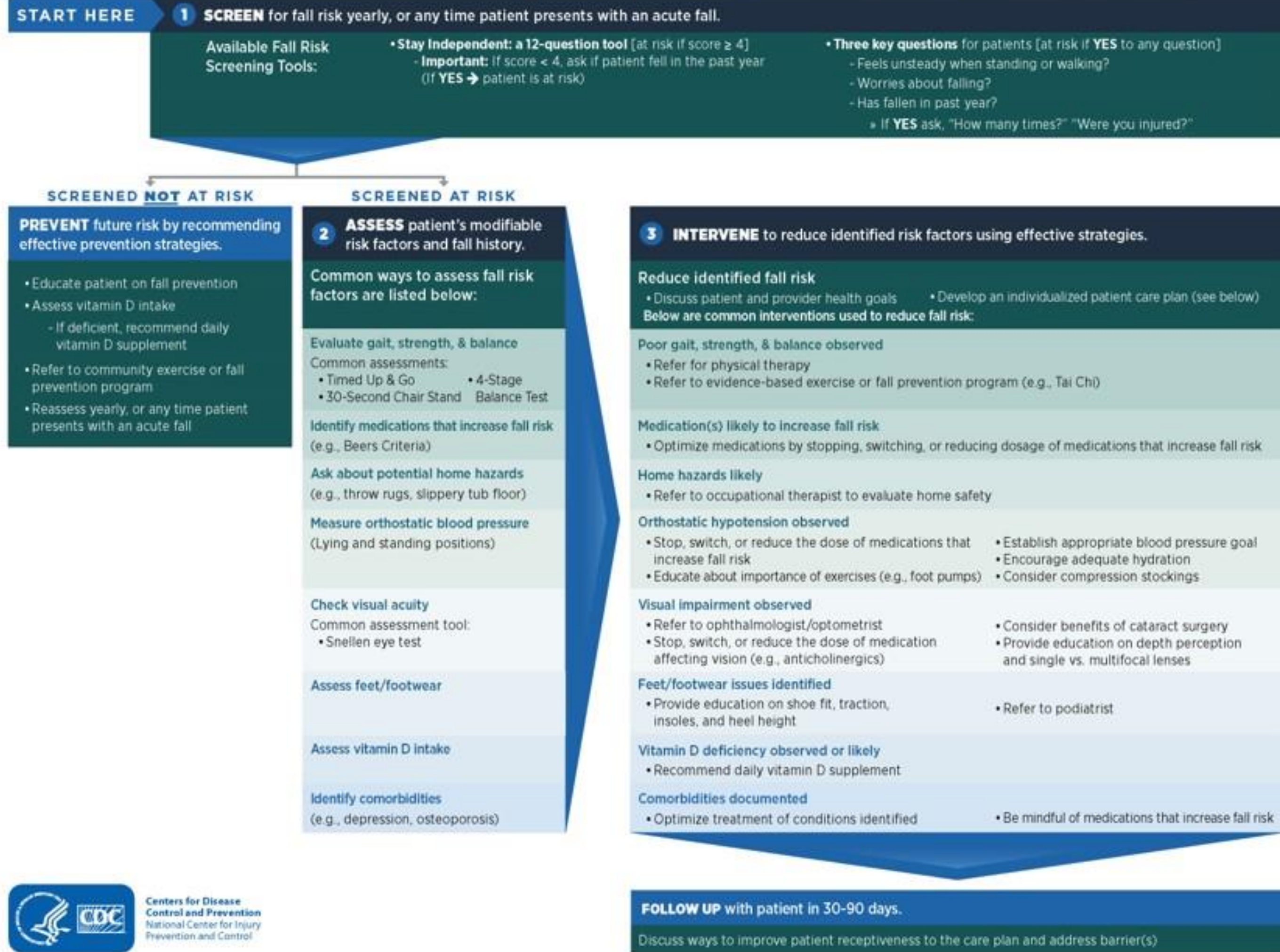
STEADI Algorithm



STEADI Resource

STEADI Algorithm: *Algorithm for Fall Risk Screening, Assessment, and Intervention*

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Common Fall Risk Factors

Modifiable Risk Factors	Non-modifiable Risk Factors
• Gait, strength, and balance deficits • Medications that increase fall risk • Home hazards • Orthostatic hypotension • Vision problems • Foot issues/inappropriate footwear • Vitamin D deficiency • Comorbidities	• Age • Sex • Race/ethnicity • History of falls

Fall risk increases as the number of risk factors increases.

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STEADI: Screening

If your patient is 65 or older, screen

- Once a year for fall risk **or**
- If they present with an acute fall

Two validated screening tools include

- CDC's *Stay Independent* questionnaire
- The Three Key Questions

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)

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

Screening Tool: *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.

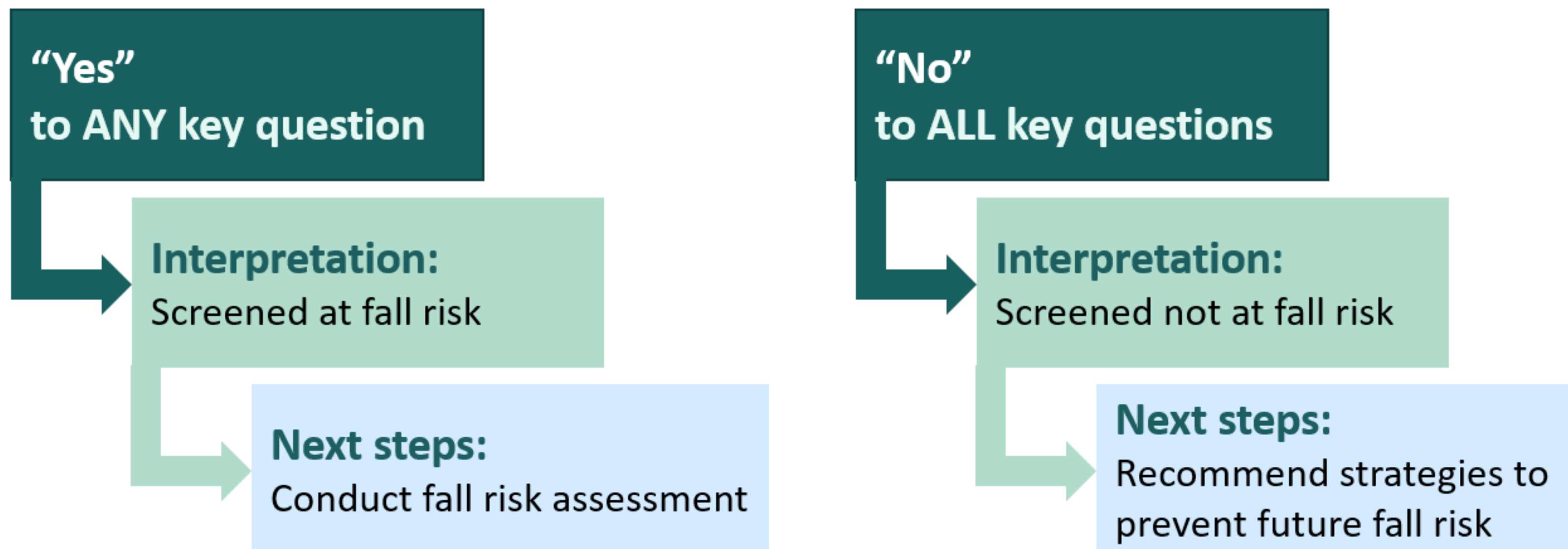
References: (28,29)

Screening Tool: The Three Key Questions

Ask your patient these questions:

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

RESULTS



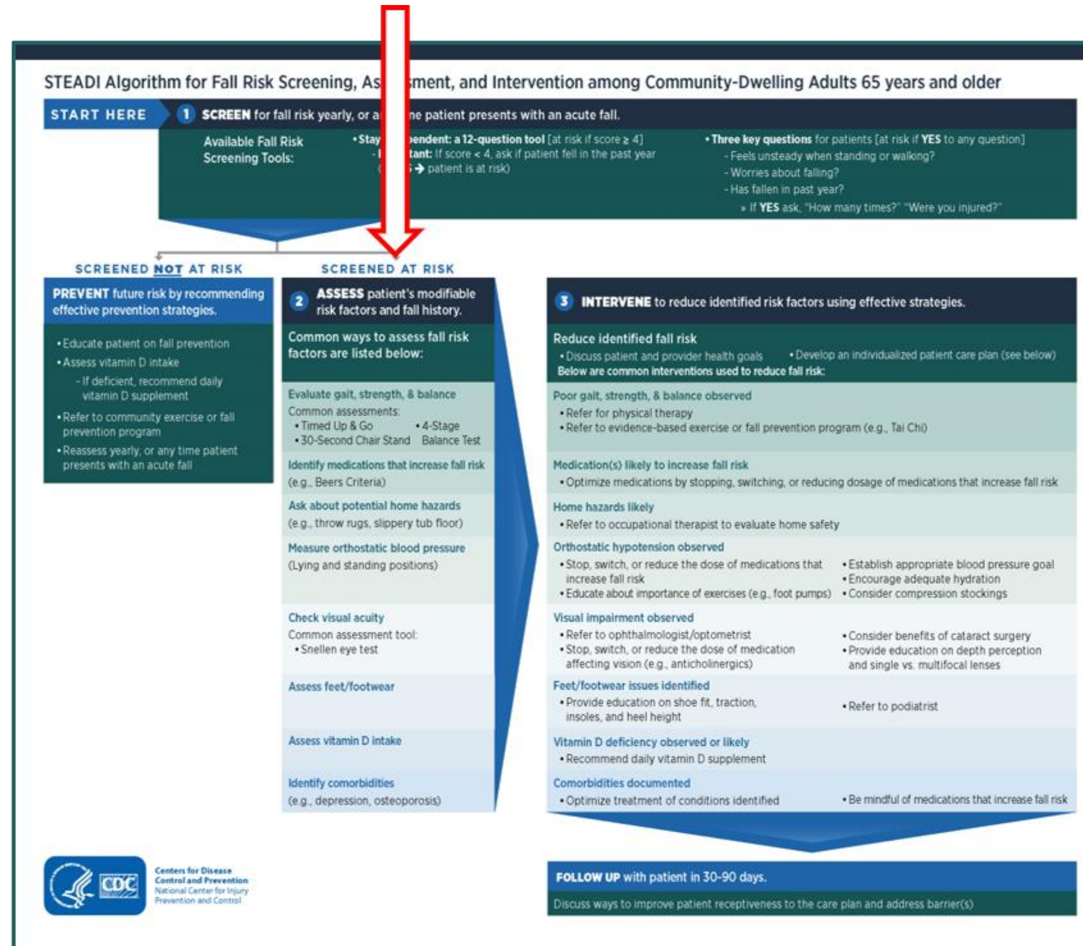
Reference: (24)

STEADI: Assessment

To identify modifiable fall risk factors in at-risk patients:

Conduct a falls history. Example questions:

- How many times have you fallen?
- Did you have any symptoms prior to your fall?
- Where and when did you fall?



References: (20,27)

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STEADI: Assessment

To identify **modifiable** fall risk factors in at-risk patients:

Conduct assessments:

- Evaluate gait, strength, and balance
- Identify medications that increase fall risk
- Ask about potential home hazards
- Measure orthostatic blood pressure
- Check visual acuity
- Assess feet and footwear
- Assess vitamin D intake
- Identify comorbidities

References: (20,27)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Gait, strength, and balance deficits	Conduct tests: - Timed Up and Go (TUG) - 30-second chair stand - 4-stage balance	• Recommend Physical therapy • Evidence-based fall prevention program

-Referral to PCP
-Home PT Referral

-AACOG AAA Referral
-COSA Parks & Rec
-Senior Centers
-YMCA
-Community programs

STEADI Resource

Handouts: *TUG, 30-second chair stand, and 4-stage balance tests*

Instructional videos: *TUG, 30-second chair stand, and 4 stage balance tests*

References: (20,22)

Evidence-based fall prevention programs

THE SOLUTION: Proven Community-Based Programs

A Matter of Balance

8-session workshop to reduce fear of falling and increase activity among older adults in the community

- **97%** of participants feel more comfortable talking about their fear of falling
- **99%** of participants plan to continue exercising
- **$938** savings in unplanned medical costs per Medicare beneficiary

Otago Exercise Program

Individual program of muscle strengthening and balance exercises prescribed by a physical therapist for frail older adults living at home (aged 80+)

- **35%** reduction in falls rate
- **$429** net benefit per participant*
- **127%** ROI**

Stepping On

7-week program that offers older adults living in the community proven strategies to reduce falls and increase self-confidence

- **30%** reduction in falls rate
- **$134** net benefit per participant
- **64%** ROI

Tai Chi: Moving for Better Balance***

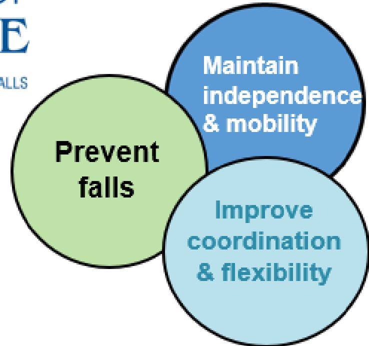
Balance and gait training program of controlled movements for older adults and people with balance disorders

- **55%** reduction in falls rate
- **$530** net benefit per participant
- **509%** ROI

Falls Free®
National Council on Aging

References: (20,22)

Evidence-based fall prevention programs



Free Classes!

Call Elisa Maria: (210) 392-4600

Classes are designed to help you increase you strength and balance and to decrease your fea of falling.

Classes are **FREE** and consist of 8 two-hour sessions.

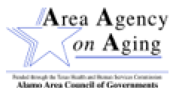
Wednesdays, May 15 – July 3, 2024

1:00 – 3:00 p.m.

New Forest Activity Room

To Pre-Register, contact Elisa Marie or call (210) 392-4600.

Classes are limited to 8-12 people so preregister early. Call today!



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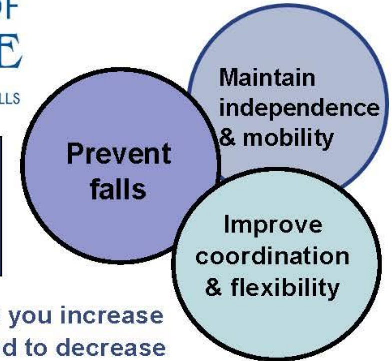
Free Classes!

To pre-register call Gabe Komerofsky at: (210) 302-6860



Classes are designed to help you increase your strength and balance and to decrease your fear of falling.

Classes are **FREE** and consist of 8 two-hour sessions led by 2 trained Coaches from AACOGs Area Agency on Aging.

Tuesdays, Oct. 15 – Dec. 10, 2024

(no class the week of Thanksgiving)

9:30 – 11:30 a.m.

The Barshop JCC on the Campus of the San Antonio Jewish Community,

12500 NW Military Hwy

To Pre-Register, please call (210) 302-6860.

Classes are limited to 8-12 people so preregister early. Call today!

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Medications that increase fall risk	Conduct a comprehensive medication review	Medication management - **Recommend** PCP visit - **Stop** medications when possible - **Switch** to safer alternatives - **Reduce** to lowest effective dose

-Referral to PCP
-Pharmacist visit or consult

STEADI Resource

Fact sheets: *Medications Linked to Falls, SAFE Medication Review Framework, STEADI-Rx Pharmacist Flyer*

References: (20,22)

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Beers Criteria

Potentially Harmful Drugs in the Elderly: Beers List and More

(B=Beers list drug; C=Canadian list drug)

Drug	Concern	Alternative Treatment
Analgesics		
Ketorolac (*Toradol*) (B); long-term use (C)	GI bleeding. [5]	Mild pain: APAP, short-acting NSAID (e.g., ibuprofen) Moderate or severe pain: morphine, hydrocodone/APAP (*Vicodin*, etc), oxycodone (*OxyContin*, etc), oxycodone/APAP (*Percocet*, etc), fentanyl patch (*Duragesic*) [19] Topicals (neuropathic pain, arthritis): lidocaine (*Lidoderm*), capsaicin (*Zostrix*, etc)
Meperidine[a] (*Demerol*) (B); long-term use (C)	Not effective at commonly used oral doses; confusion, falls, factures, dependency, withdrawal [5,15]	
Pentazocine (*Talwin*) (B); long-term use (C)	More CNS effects (e.g., confusion, hallucinations) than other opioids; ceiling to analgesic effect [5]	
Propoxyphene (e.g., Darvon, etc) (B)	No better than acetaminophen, but has narcotic AE [5]	
Antidepressants		
Amitriptyline (*Elavil*) (B, C), doxepin (*Sinequan*, etc) (B), imipramine (*Tofranil*) (C)	Anticholinergic AE, sedation, urinary retention or incontinence, constipation, arrhythmias, falls [5,15]	Tricyclic without active metabolites (Nortriptyline [*Pamelor*], desipramine [*Norpramin*]) [15] Trazodone (for insomnia) [19] SSRI [15] Bupropion (*Wellbutrin*) (for cardiac patient) [19] Mirtazapine (*Remeron*) (for insomnia or anorexia) [19] Neuropathic pain: topicals (lidocaine [*Lidoderm*], capsaicin [*Zostrix*, etc])
Bupropion (*Wellbutrin*), seizure disorder (B)	May cause seizure [5]	Tricyclic without active metabolites (Nortriptyline [*Pamelor*], desipramine [*Norpramin*]) [15] Trazodone (for insomnia) [19] SSRI [15] Mirtazapine (*Remeron*) (for insomnia or anorexia) [19]
Fluoxetine (*Prozac*) used daily (B)	Long half-life; agitation, insomnia, anorexia [5]	SSRI with shorter half-life (e.g., escitalopram [*Lexapro*], sertraline [*Zoloft*])
Tricyclic for depression in patient with postural hypotension, BPH, glaucoma, heart block (C)	Fall risk; urinary retention; worsening glaucoma, heart block [15]	SSRI, with blood pressure monitoring [15]
Tricyclic in patient with stress incontinence or bladder outflow obstruction (B)	Urinary retention or incontinence [5]	Antidepressant with little anticholinergic or alphablocking effect (e.g., citalopram [*Celexa*]), bupropion [*Wellbutrin*])
SSRIs in patient with SIADH (B)	May cause or worsen SIADH [5]	Tricyclic without active metabolites (Nortriptyline [*Pamelor*], desipramine [*Norpramin*]) [15] Trazodone (for insomnia) [18] Bupropion (*Wellbutrin*) (for cardiac patient) [19] Mirtazapine (*Remeron*) (for insomnia or weight loss) [18]
SSRI in patient on MAOI (C)	Enhanced SSRI side effects [15]	Avoid combination. If switching from MAOI to another antidepressant, ensure a 14-day washout. If switching from another antidepressant to an MAOI, minimum washout is 2 weeks for drug without long half-life and 5 weeks for drug with long half-life (e.g., fluoxetine). [30]

https://www.carepatron.com/

Powered by carepatron

Table 2. Deprescribing guidance for STOPPFall items

	Fall-risk assessment: In which cases to consider withdrawal?[a]	Is stepwise withdrawal needed?[b]	Monitoring after deprescribing[c]
Always	-If no indication for prescribing -If safer alternative available		-Fall incidence and change in symptoms e.g. OH, blurred vision, dizziness -Organise follow-ups on individual basis
Benzodiazepines (BZD) and BZD-related drugs	-If daytime sedation, cognitive impairment, or psychomotor impairments -In case of both indications: sleep and anxiety disorder	In general needed	-Monitor: anxiety, insomnia, agitation -Consider monitoring: delirium, seizures, confusion
Antipsychotics	-If extrapyramidal or cardiac side effects, sedation, signs of sedation, dizziness, or blurred vision -If given for BPSD or sleep disorder, possibly if given for bipolar disorder	In general needed	-Monitor: recurrence of symptoms (psychosis, aggression, agitation, delusion, hallucination) -Consider monitoring: insomnia
Opioids	-If slow reactions, impaired balance, or sedative symptoms -If given for chronic pain, and possibly if given for acute pain	In general needed	-Monitor: recurrence of pain -Consider monitoring: musculoskeletal symptoms, restlessness, gastrointestinal symptoms, anxiety, insomnia, diaphoresis, anger, chills
Antidepressants	-If hyponatremia, OH, dizziness, sedative symptoms, or tachycardia/arrhythmia -If given for depression but depended on symptom-free time and history of symptoms or given for sleep disorder, and possibly if given for neuropathic pain or anxiety disorder	In general needed	-Monitor: recurrence of depression, anxiety, irritability and insomnia -Consider monitoring: headache, malaise, gastrointestinal symptoms
Antiepileptics	-If ataxia, somnolence, impaired balance, or possibly in case of dizziness -If given for anxiety disorder or neuropathic pain	Consider	-Monitor: recurrence of seizures -Consider monitoring: anxiety, restlessness, insomnia, headache

eck for Safety

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References: (2022)

Seppala LJ, Petrovic M, Ryg J, et al. STOPPFall (Screening Tool of Older Persons Prescriptions in older adults with high fall risk): a Delphi study by the EuGMS Task and Finish Group on Fall-Risk-Increasing Drugs. *Age Ageing*. 2021;50(4):1189-1199. doi:10.1093/ageing/afaa249

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Home hazards	Ask patients and their family members about home safety	• Remove obvious slip/trip hazards • Refer to occupational therapy • Recommend tips to improve home safety

-Home OT Referral

-Refer to PCP

-Home OT Referral

STEADI Resource

Educational material: *Check for Safety*

References: (20,22)

IDENTIFYING FALL HAZARDS IN THE HOME

Bedroom

FACT: Falls caused by poor lighting result in **8 million** falls each year in the US.

Lose items

Keep loose items off the floor, like dirty clothes or a towel, to prevent seniors from tripping over them.

Poor lighting

Poor lighting anywhere in the home can reduce visibility and lead to a serious fall. Make sure the home is well lit and consider adding night lights down hallways and stairs in case seniors get up in during the night.

Bed

Getting out of bed can become a dangerous for seniors who are prone to falling. Install bedrails to the side of the bed to help aging seniors stay in bed and get out of bed safely.

Stairs & Hallways

FACT: Adults over **75 years** old are **5x** more likely to fall on the stairs than younger adults. FACT: Every **30 seconds**, an individual in the US falls on the stairs.

Unstable handrails

When seniors go up or down the stairs, they may rely on the handrails to support their weight. A weak or unsteady handrail could cause them to fall.

Carpet runners

Carpet runners are decorative elements that run down the stairs or hallway. These carpets can create uneven surfaces that may cause a senior to trip.

Low contrast

Seniors with vision problems may not be able to see where one stair ends and another begins. Consider adding a contrasting color or design to the end of the stair treads.

Bathroom

FACT: **80%** of senior falls occur in the bathroom.

Wet floor

The bathroom floor can become slippery as a senior goes about their daily routine. Add skid-resistant rugs that won't slide on hard surfaces to help absorb water droplets.

Slippery tub

The bathtub is a common place for falls. Use non-slip shower mats to give the tub more traction or consider a shower chair and handheld shower head.

Low toilet seats

Seniors may have difficulty standing up after using the restroom, especially if the toilet seat is low. Install grab bars near the toilet to help a senior sit down and stand up with ease. Or add a raised toilet seat.

Kitchen

FACT: Every **19 minutes**, a senior dies from a fall.

Heavy items

It can be dangerous for seniors to lift heavy appliances in their kitchen. If their strength fails, a senior may accidentally drop the appliance on themselves or they may fall. Try placing heavy appliances on low shelves or on the countertop.

Unstable chairs

Unstable furniture can knock a senior off of their balance. Make sure the chairs are stable and won't slide around on the kitchen floor. Chairs with armrests are best because the armrests provide extra stability when seniors stand up.

Spills

We all make messes in the kitchen. But these messes can turn into hazards for seniors if they aren't cleaned up quickly.

Outdoors

FACT: **30%** of senior falls occur outside the home.

Uneven or cracked concrete

Uneven concrete in your driveway, sidewalk, or patio could cause a senior to trip and fall. Repair the concrete if possible, or mark hazardous areas with bright paint, small neon flags, or other items.

Poor traction

Outdoor areas may become slick due to weather or other factors. The lack of traction can cause a senior to slip. Try adding textured paint to your deck, abrasive strips to stairs, or having your senior loved one wear shoes with good traction. Depending on the weather, you may need to put ice melt on the driveway.

Overgrown trees and shrubs

Pruning tall branches may be difficult and could cause a senior to overexert or injure themselves. However, if not taken care of, branches and shrubs can become a hazard to the home. Consider helping out your loved one or hiring a professional.

Living Room

FACT: Each year, seniors are treated in the emergency room for falls.

Cords and wires

Make sure that cords and wires are out of the way

Throw rugs

Throw rugs might look great in your space, but they can be a tripping hazard. They can cause uneven surfaces, and seniors might trip over the edges. If you do have a rug, secure it with tape or other adhesive.

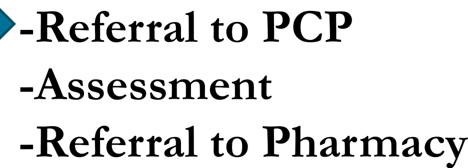
Narrow pathways

Seniors need ample space to navigate the home. Narrow pathways can cause them to lose their balance and fall. Ensure that there are clear pathways to navigate around furniture in the living room.

References: (20,22)

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Orthostatic hypotension The patient has orthostatic hypotension if systolic blood pressure drops by at least 20 mm Hg or diastolic by at least 10 mm Hg	Measure orthostatic blood pressure 1. Have the patient lie down for 5 minutes 2. Check blood pressure 3. Have the patient stand 4. Check blood pressure within 3 minutes	• Follow up with PCP • Treat underlying cause • Adjust medications if warranted



STEADI Resource

Handout: *Measuring Orthostatic Blood Pressure*
Educational material: *Postural Hypotension*

References: (20,22)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Vision impairment	• Ask patients about vision problems • Use Snellen eye chart to assess visual acuity • Ask if patient uses bifocal lenses when outdoors	• Follow up with PCP • Refer to ophthalmology or optometry • Recommend single distance lenses for walking outside

-Referral to PCP
-Referral to Opthal/Optom Specialist

STEADI Resource

Guide: *Coordinated Care Plan to Prevent Older Adult Falls*
Educational materials: *Family Caregivers: Protect your Loved Ones from Falling, What You Can Do to Prevent Falls*

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Feet or footwear issues	• Look for foot deformities, deficits in sensation, or pain • Assess for inappropriate footwear	• Counsel on shoe fit, insoles, and heel height • Recommend non-slip shoes and socks • Refer to podiatry

-Referral to OT or PT

-Basic Recommendations

-Referral to PCP

STEADI Resource

Guide: *Coordinated Care Plan to Prevent Older Adult Falls*
Educational materials: *Family Caregivers: Protect your Loved Ones from Falling, What You Can Do to Prevent Falls*

References: (20,22)

Components of STEADI: Examples

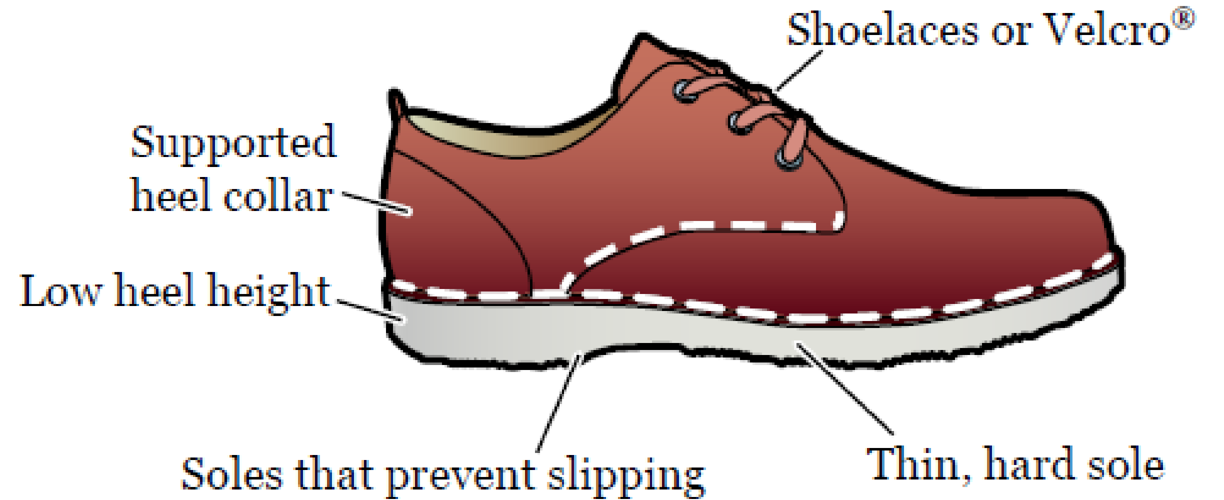
Fastening mechanisms ensure that the foot is anchored firmly in the shoe. Consider shoes with Velcro or buckles if you find it difficult to manage laces.

A firm heel counter helps with stability.

A low, broad heel helps with stability and maximises contact with the ground.

A slip resistant sole that is textured on the underside provides better grip and helps to prevent slipping.

Front of shoe (toe box) should be deep and wide enough to accommodate the toes comfortably, but is not too loose.



References: (20,22)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Vitamin D deficiency	Ask about patient's dietary vitamin D intake, use of vitamin D supplements, and sun exposure	• Recommend PCP visit • Consider increasing dietary vitamin D or daily vitamin D supplements if the patient has a vitamin D deficiency

-Referral to PCP

STEADI Resource

Guide: *Coordinated Care Plan to Prevent Older Adult Falls*
Educational materials: *Family Caregivers: Protect your Loved Ones from Falling, What You Can Do to Prevent Falls*

References: (21,22)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Comorbidities	Screen for comorbidities such as osteoporosis, depression, dementia, incontinence	• Recommend PCP visit • Optimize treatments of identified conditions

-Referral to PCP

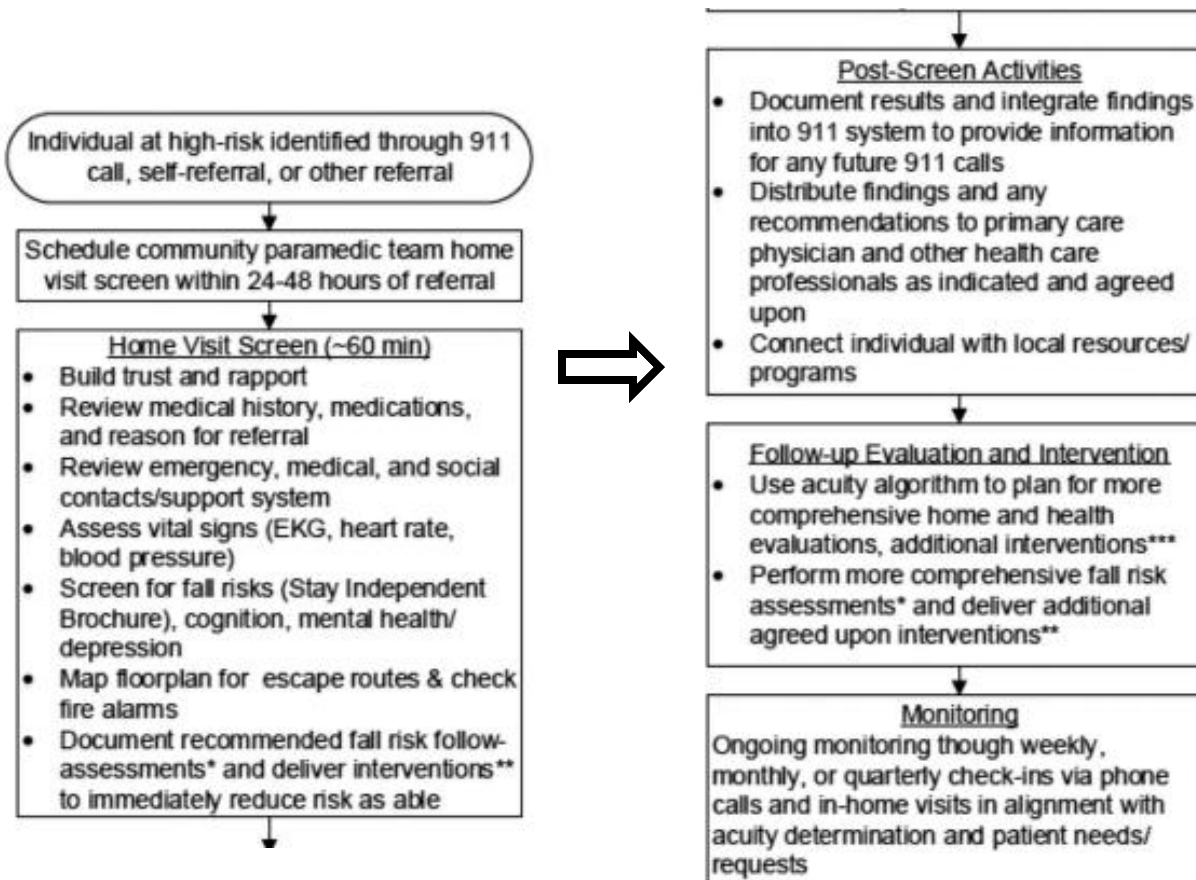
STEADI Resource

Guide: *Coordinated Care Plan to Prevent Older Adult Falls*
Educational materials: *Family Caregivers: Protect your Loved Ones from Falling, What You Can Do to Prevent Falls*

References: (20,22)

Is there any hope? Any evidence?

- Columbus, Ohio fire-based EMS
- Local university partnership
- Community paramedics from FD
- 1 hour initial visit, 30 min follow up



*Fall Risk Assessments
- Footwear assessment
- Vision screen
- Nutrition screen
- Timed Up & Go Assessment
- Home environmental hazard scan

**Fall Prevention Interventions
- Grab bar installation(s) in high-risk areas
- Decluttering and rug removal
- Education about behaviors that can increase risk (e.g., poor footwear, physical weakness, trying to reach objects in difficult to reach areas, poor lighting, poor nutrition)
- Care coordination with other health cares to providers to reconcile medications, secure and ensure appropriate use of assistive devices and durable medical equipment (e.g., canes, wheelchairs, tub/shower chairs, raised toilet seats)
- Encourage and facilitate referrals for additional evaluations for vision, occupational therapy, physical therapy, mental health, and other health services
- Facilitate enrollment in local social services (e.g., meal delivery, snow removal, garbage assistance)

Quatman-Yates CC, Wisner D, Weade M, et al. Assessment of Fall-Related Emergency Medical Service Calls and Transports after a Community-Level Fall-Prevention Initiative. *Prehosp Emerg Care*. 2022;26(3):410-421.

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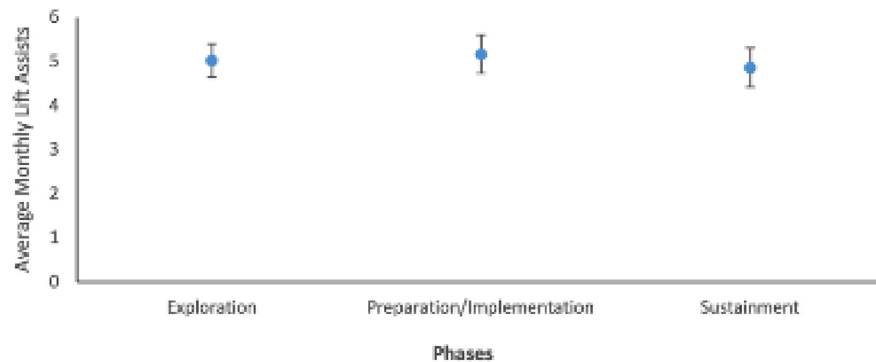

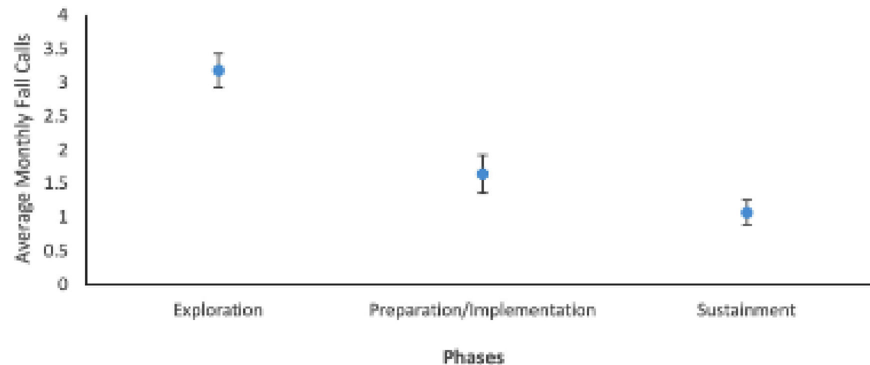

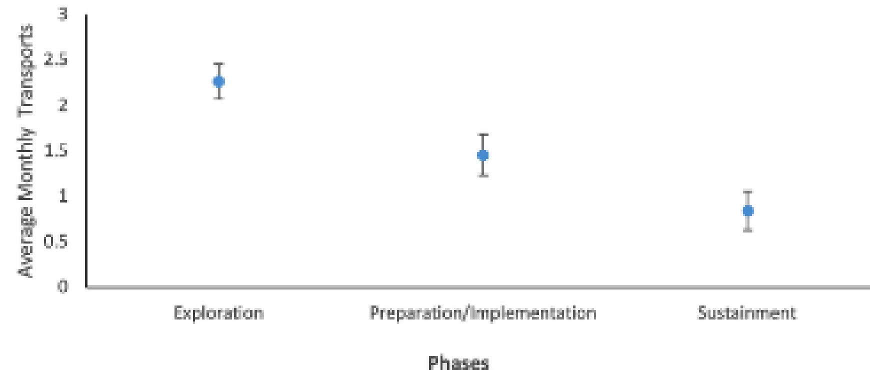

RESULTS

- Lift assists: 4% decrease
  - No significant change
  - Population change, aging
- Fall calls: 66% decrease
- Fall transports: 63% decrease

Quatman-Yates CC, Wisner D, Weade M, et al. Assessment of Fall-Related Emergency Medical Service Calls and Transports after a Community-Level Fall-Prevention Initiative. *Prehosp Emerg Care*. 2022;26(3):410-421.

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Medstar EMS (Fort Worth, TX)

- Used STEADI questions for routine risk screening of all 65+ patients
- High-risk medications
- Referral for High Utilizer Group (HUG) community paramedic program

Results

Emergent 9-1-1 calls for older adults resulted in 50.5% (n=45,090) of individuals aged ≥65 years old being screened for risk of falls using the fall risk inquiry. Following screening, 59.3% (n=26,739) of individuals were determined to be at risk of falls due to a score of ≥4 on the fall risk inquiry. Additionally, the EMR data identified that 48.1% (n=21,673) of older adults were using medications that were potentially inappropriate based on Beer's Criteria[21] which could have a detrimental influence on fall risk.

Table 1 Provider Service Intervention

Provider	Program/Service	Intervention Resources/Activities	Outcome Tools/Utilization Tracking
Emergency paramedic	9-1-1 Emergency responses	• Modified home environment assessment • Beer's criteria medication review	• Identified fall risk factors • Repeat calls
Community Paramedics	High Utilization Group (HUG) 30-day Hospital Readmission Avoidance (HRA)	• CDC STEADI *Stay Independent* fall risk inquiry • Beer's criteria medication review • Timed Up and Go (TUG) • 30-second Chair Stand test • 4-Stage Balance Test • CDC STEADI *Check for Safety*	• EuroQoL-5 Dimension • Referral services • Falls data (1-year pre/post) • Emergency transport needs • Emergency department visits • 30-day Hospital re-admissions • Hospital Utilization Data (1-year post)

Table 3 Cost Savings for the High Utilization Group (HUG) Program

Category	Base	Avoided	Savings
Ambulance Payment[a]	$419	379	($158,801)
Emergency Department Visits[b]	$969	364	($352,716)
Hospital Admissions[c]	$10,891	51	($555,464)
Total			($1,066,981)
Average/Patient			($19,053)

Notes: Comparison of patient EMS utilization 12 months before enrollment to 12 months post-program graduation. Data from 1/1/19-12/31/22 for 56 patients. [a]Payment based on Medicare (MCR) rate for ambulance transport ($214.47 plus mileage) with average mileage rate ($309.90) totaling $524.37. MCR reimbursement at 80% = $419.49. [b]Emergency deparmnent visits data from Yun J, Oehlman K and Johansen M.[23] [c]Hospital admissions data from McDermott KW, Elixhauser A, Sun R.[24]

Camp K, Murphy S, Pate B. Integrating Fall Prevention Strategies into EMS Services to Reduce Falls and Associated Healthcare Costs for Older Adults. *Clin Interv Aging*. 2024;19:561-569. Published 2024 Mar 22. doi:10.2147/CIA.S453961

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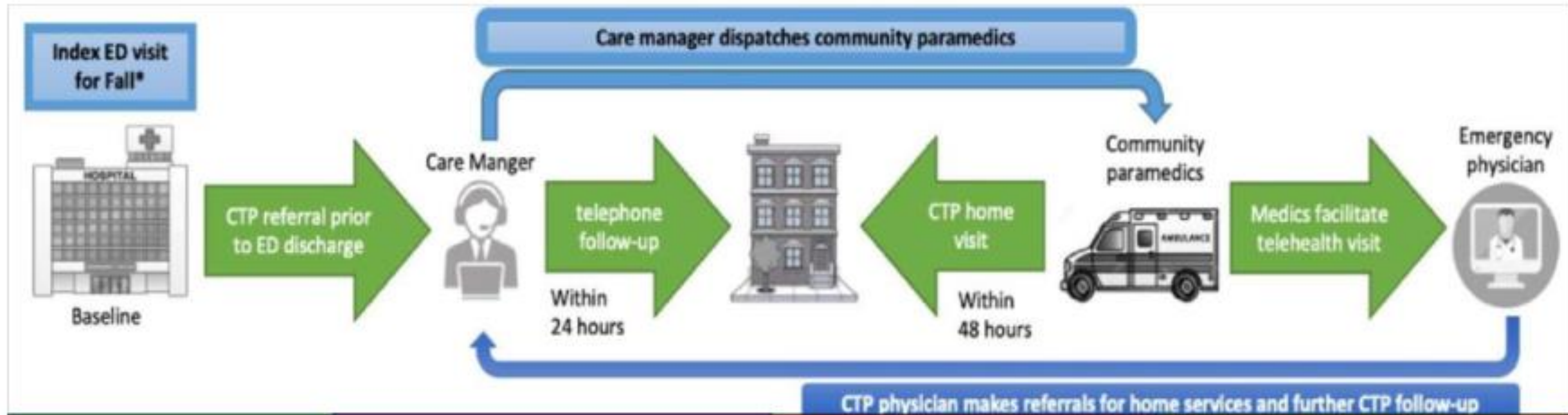
Novel Emergency Department and EMS Partnership



Who

2 community paramedics
2 nurse care managers
1 emergency medicine physician

High falls risk (STEADI >4)
Older adults discharged home after an ED visit

What

Home visit by CPs facilitating a telehealth visit with ED physician
Standardized CTP checklist
Home fall hazard assessment
Timed Get Up and Go test
Mini Mental Status exam
Fall-risk Reduction plan including medication adjustment & referrals

When & Where

Pilot project of 104 patients from 11/2022 to 6/2023
Urban, academic ED with >100,000 visits annually
>1/3 visits by patients 65 or older
Existing mobile integrated health program (CTP) since 2019 with over 5000 home visits

Why

We were able to conduct comprehensive fall-risk assessments at home where most falls take place in nearly 2/3 patients enrolled
Modifiable fall-risk factors were identified in most patients
Only one fall occurred during 30-day follow up

Jiang LG, McGinnis C, Benton E, et al. Using tele-paramedicine to conduct in-home fall risk reduction after emergency department discharge: Preliminary data. *J Am Geriatr Soc*. 2025;73(1):232-242. doi:10.1111/jgs.19080

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2024 USPSTF Update to Fall Prevention Recommendations

Recommendation Summary

Population	Recommendation	Grade
Community-dwelling 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
Community-dwelling adults 65 years or older	The USPSTF recommends that clinicians individualize the decision to 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 Practice Considerations section for information on risk assessment for falls.	C

Guirguis-Blake JM, Perdue LA, Coppola EL, Bean SI. Interventions to Prevent Falls in Older Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. *JAMA*. 2024;332(1):58-69. doi:10.1001/jama.2024.4166

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Local Resources

Alamo Area Agency on Aging (AAAA, part of AACOG)

Residential repairs, health maintenance, care coordination for age 60+, caregiver support,

Free exercise classes for fall prevention (TExercise, Matter of Balance, Bingocize)

(210) 477-3275 M-F 8a-4:30p – Alamo Service Connection hotline

Project MEND **(210) 223-6363** M-F 8a-12p; 1p-5p

Free medical equipment reuse; up to $1,000 assistive technology; Need basic Rx/Referral

Home hospital beds, wheelchairs, rollators, tub transfer benches, power chairs, power scooters, bedside commode

Meals on Wheels **(210) 735-5115** M-F 8a-4p (or https://www.mowsatx.org/referral)

Eligibility: homebound, cannot drive, cannot make own meals, need SSN

Meal delivery: lunch, breakfast, weekend meals

AniMeals: pet food delivery (dog or cat)

Emergency meals: immediate relief, weather disruptions

Friendly Visitor: social engagement

Comfy Casas: minor home repairs to address home safety and living conditions

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SAFD, UT OMD, and STRAC Partnerships

DO YOU FEAR FALLING?

The STRAC **Fall Awareness Lengthens Lives (*FALL*)** one-hour class is designed to provide you with ways that you can help prevent falls.

PROGRAM OBJECTIVES:

1. Identify slip, trip, and fall hazards
2. Discuss ways to avoid injuries & the importance of activity
3. Review medications that may cause falls
4. Discuss why eye exams are needed

TARGET AUDIENCE:

1. Anyone concerned about falling
2. Anyone interested in improving balance
3. Anyone who has fallen in the past
4. Anyone limiting activities due to a fear of falling

When:
Where:
RSVP:

OVER 95% OF THE 258,000 HIP FRACTURES THAT OCCUR EVERY YEAR ARE CAUSED BY FALLS.

SOUTHWEST TEXAS REGIONAL ADVISORY COUNCIL | STRAC.ORG

<u>FALL Classes in past year</u>

- New Forest (multiple)
- Discovery Village
- Independence Hill
- Independence Village
- Franklin Park – Alamo Heights
- Franklin Park – TPC Parkway
- Franklin Park – Sonterra

- Please suggest more! (QR code at end)

Acknowledgements

- Department of Emergency Health Sciences
- Department of Emergency Medicine
- San Antonio Fire Department
- South Texas Regional Advisory Council (STRAC)

Summary

- Morbidity and mortality of falls in EMS and ED settings
- How to prevent falls with STEADI algorithm
- Evidence for applications of STEADI in EMS and ED
- Community resources
- Questions?

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Questions?

More Resources Here →

tinyurl.com/UT-EM-Falls

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(210) 567-7879

UT Health
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References

- Camp K, Murphy S, Pate B. Integrating Fall Prevention Strategies into EMS Services to Reduce Falls and Associated Healthcare Costs for Older Adults. *Clin Interv Aging*. 2024;19:561-569. Published 2024 Mar 22. doi:10.2147/CIA.S453961
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