

Older Adult Fall Prevention



Introduction

As the United States prepares for a record shift in population age, public health must continue to promote healthy aging through policies and programs that support older adults and their community. Nearly 20% of Americans—approximately 73 million—will be aged 65 or older by 2030.^{1,2} The older adult population faces a range of serious and expensive health concerns, such as chronic conditions; physical impairment; and sensory, physiological, and cognitive decline.³ Chiefly among these concerns is the prevalence of falls among community-dwelling older adults.

A fall, defined as an event in which a person unintentionally comes to rest on the ground or another lower level, can be devastating to an older adult's health and wellbeing.⁴ The purpose of this issue brief is to inform local health departments about the impact of falls on their community, the importance of fall prevention, available evidence-based interventions, and the opportunity to work with community partners, such as emergency medical services (EMS), who are uniquely positioned to prevent older adult falls.

Falls are the leading cause of fatal and non-fatal injuries in adults aged 65 or older.⁵ In the United States, approximately one in four adults 65 years or older report at least one fall each year, totaling an estimated 36 million falls resulting in 8 million injuries in 2018.⁶ On average, older adult falls result in approximately 3 million emergency department visits and more than 950,000 hospitalizations annually, costing nearly \$50 billion in direct medical expenses.^{7,8}

Fatality rates for falls in older adults increased 31% from 2007–2016.^{9,10} In 2016, fall death rates for older adults



in the United States were nearly 62 per 100,000 older adults.¹¹ Even when not fatal, falls can still be serious. Head injuries, broken bones, and other grave injuries occur in 20% of falls, making falls a leading cause of traumatic brain injuries (TBIs) and hip fractures.^{12,13,14} Between 2007 to 2013, the number and rate of older adult fall-related TBIs increased significantly.¹⁵ These injuries in older adults can result in problems performing activities of daily living and a loss of independence. Aside from the physical effects, experiencing a fall also creates a fear of falling again. This fear is not unfounded. While there are a number of risk factors, the U.S. Preventive Services Task Force recommends assessing patients for a previous history of falls, as it is the most common risk factor used to identify individuals at increased risk for future falls.¹⁶

Older adults often have multiple risk factors that put them at risk of falling, including difficulties with walking and balance, lower body weakness, postural hypotension, vitamin D deficiency, vision problems, and use of some medicines with side effects that may increase fall risk.¹⁷ While the impact of falls on a personal, economic, and public health level is significant, falls are preventable. Given the burden of morbidity and the complexity of risk factors involved in older adult falls, local health jurisdictions should look to evidence-based fall prevention programs to effectively address the needs of older adult populations. These programs vary by focus, target population, and setting but typically include one or more of the following components: exercise, medication management, or home modifications.¹⁸

Evidence-Based Programs and Practices

For a comprehensive list of evidence-based interventions for fall prevention, view the CDC's [Compendium of Effective Fall Interventions](#) and the National Council on Aging's (NCOA) [Evidence-Based Falls Prevention Programs](#).

NACCHO's Work in Older Adult Fall Prevention

The National Association of County and City Officials (NACCHO), with support from Centers for Disease Control and Prevention (CDC), launched Developing the Capacity to Support Older Adult Falls Prevention, a project to help local health departments strengthen their capacity to identify older adults at risk for falls, assess modifiable risk factors, and link older adults to clinical resources and community programs to mitigate fall risk. Community partners, such as first responders, are often key to fall prevention efforts.

As such, NACCHO began working with the National Association of State EMS Officials (NASEMSO) in 2019 to conduct an environmental scan to identify fall prevention models that are integrated into community paramedicine. Once identified, NASEMSO and NACCHO conducted focus groups with key informants identified by the community

paramedicine programs. The goals of these focus groups were to better understand different models of fall prevention programs, including their successes and challenges. Analysis of the focus group data examined key similarities and differences across programs in areas such as collaboration with partners, funding, and program evaluation.

Future work on this project will include deeper analysis of the barriers and facilitators of implementing these models and the development of additional tools or resources to support local health departments and their partners.



Exercise and Physical Activity

Exercise interventions, or “planned, structured, and repetitive physical activity,” done within group settings, individually, or with a physical therapist, can improve balance, coordination, and muscle strength among older adults at risk of falls.¹⁹ Exercise interventions specifically containing balance and strength training components have been shown to effectively reduce falls among older adults.²⁰ These interventions are typically implemented within community settings but can also be done at home.

For example, a study found that a six-month Tai Chi intervention successfully decreased the number of falls, as well as the number of falls causing injury among participants over the age of 65. The Tai Chi intervention also decreased the fear of falling and improved functional balance and physical performance among physically inactive older adult participants.²¹

Additionally, fall prevention interventions delivered by a physical therapist have been shown to reduce the number and risk of falls.²² As physical therapists specialize in movement and exercise, they can work with older adult patients to improve strength and balance, either individually or in group settings. A study examining the effectiveness of a physical therapist-administered group-based exercise intervention found that it successfully decreased fall frequency, increased balance, and improved quality of life.²³ As such, primary care providers should consider referring patients to physical therapy services to help mitigate falls risk.



Medication Management

Older adults are more likely to take multiple prescription and over the counter medications compared to their younger counterparts.²⁴ Over 90% of older adults take at least one prescription medication and more than half take four or more prescription drugs daily.²⁵ Several types of medication including psychotropic and cardiovascular drugs, are associated with an increased risk of falls.²⁶

Medication management interventions, facilitated by primary care providers and pharmacists, typically include a review of age-related physical changes that predispose older adults to drug interactions and side effects, such as dizziness or sleepiness, that can increase their risk of falling.²⁷ Gradual withdrawal of psychotropic medications has been found to significantly reduce the rate of falls among older adults.²⁸ A study examining the effectiveness of psychotropic drug withdrawal found a 66% reduction

in falls among older adult patients who gradually withdrew usage of psychotropic medications compared to those who continued use.²⁹ Further research has demonstrated that drug withdrawal among older adult populations can be done safely with adequate follow up.³⁰

CDC developed the [STEADI-Rx](#) tool, in collaboration with the University of North Carolina Eshelman School of Pharmacy and School of Medicine, to promote fall prevention in community pharmacies. STEADI-Rx helps pharmacists to address the risk of falls among older adult patients by providing tools to screen patients, assess their medications, and coordinate care with primary care providers.³¹



For a comprehensive list of medications and medication classes that should be used with caution among older adult populations, please review the [American Geriatrics Society \(AGS\) Beers Criteria](#).

Home Safety Modifications

Home safety interventions aim to improve the home environment to reduce the risk of falls. These programs generally target older adults with a history of falls and

those with limited mobility.³² These interventions commonly involve home visits by an occupational therapist and a home maintenance professional that combine education with home repairs to reduce the risk of falls related to safety hazards within the home. Several studies have found that home modification interventions are effective at reducing the rate of falls among community-dwelling older adults.³³ However, challenges such as a lack of funding, coordination among service providers, and residential policies that prohibit home safety modifications make these interventions less available.³⁴

Cross-Cutting Interventions

Cross-cutting interventions to prevent falls typically include multifactorial and multiple component intervention programs and strategies. Multifactorial interventions incorporate multiple fall prevention strategies and can be customized to the individual's identified risks, usually following a risk factor assessment.³⁵ These interventions typically involve an interdisciplinary team of providers from medicine, physical and occupational therapy, and social work and have been shown to be more effective than interventions utilizing a single strategy or provider.³⁶

For example, Stepping On is a multifaceted community-based fall prevention program that aims to improve fall self-efficacy and behavior change to reduce falls through balance and strength exercises, home safety interventions, medication reviews, and a small group learning environment. One study examining this program found a 31% reduction in falls among the intervention group.³⁷

Multiple component interventions incorporate two or more interventions, such as exercise and home modifications, that are provided without an individualized risk assessment.³⁸ A systematic review found that multiple component interventions can reduce both the rate and number of falls among older adult populations.³⁹

Community Paramedicine

Fall prevention efforts should aim to improve the quality of life among older adults, while minimizing the risk of falls that could result in serious injury or death. While there is a wealth of evidence-based practices available, there is often a gap in communication between clinicians and community providers.⁴⁰ Most communities lack a coordinated system for this type of communication, which directly impacts older adult engagement in interventions. Clinicians may not be aware of available community programs, and community providers may have difficulty gauging interest and demand for these programs.

Collaboration among healthcare providers and community agencies should be prioritized and coordinated to fully realize the potential impacts of older adult fall prevention programs. Leveraging

community partners to address older adult falls can result in more comprehensive, effective, and potentially less costly programs. For instance, EMS are often the first point-of-contact when an older adult experiences a fall, requires assistance with mobility, or needs to be transported for additional medical care.⁴¹ Given the high volume of fall-related calls, EMS providers have the unique opportunity to engage with older adults and directly intervene in preventing future falls.

Community paramedicine (CP) is a new community-based health care model in which EMS providers take on an expanded role to improve access to primary care and prevention programs for medically vulnerable populations.⁴² In recent years, the number of CP programs that address older adult falls has grown substantially in a number of states and counties across the US.⁴³ These programs may be implemented as a collaborative effort among local health departments,



What is Community Paramedicine?

Community paramedicine expands the roles of EMS professional to provide acute and chronic disease prevention and health promotion services for vulnerable and underserved populations. Community paramedicine programs may aim to:

- Increase access to primary care.
- Reduce unnecessary EMS transports or hospital readmissions.
- Integrate a multidisciplinary team of providers to support vulnerable populations, including older adults at risk for falls.
- Collaborate with local health departments, health systems, home health agencies, and social service agencies.
- Connect patients to community-based health promotion programs.

EMS, fire departments, and other health care or social service providers. Recent research has supported EMS providers' unique opportunity to provide fall-risk-reduction interventions and found these programs to be both effective and feasible.⁴⁴

Local health departments can use partnerships with CP programs to help bridge the gap between clinical and community fall prevention efforts. Through CP programs, EMS professionals can assist with screening and enrolling patients in community-based fall prevention programs as well as provide follow-up services to patients recently discharged for fall-related injuries. Research has demonstrated that EMS referrals to community-based fall prevention programs can reduce future falls and improve clinical outcomes.⁴⁵

Conclusion

Falls are the leading cause of morbidity and mortality among older adult populations nationwide.⁴⁶ While falls are common, they are largely preventable. Evidence-based practices implemented within community settings

are all effective methods for addressing older adult falls, including exercise and physical activity interventions, medication management, home safety interventions, and programs that encompass multiple strategies. Local health departments should strive to improve communication, care coordination, and awareness of available services among local agencies, providers, and community-based organizations. Leveraging diverse resources such as CP programs can be an innovative way to bridge this gap in care and effectively combat rising rates of older adult falls.⁴⁷

Future research should focus on facilitating clinical and community integration and further identifying evidence-based CP fall prevention strategies. Additionally, priorities and standards for new research need to be established, while incorporating the voice of older adult populations, healthcare providers, community agencies, EMS professionals, and social service providers. Multidisciplinary collaboration will be essential to realize the profound impact of older adult fall prevention efforts.



Strategies for Preventing Falls Among Older Adult Populations

- Fall prevention efforts should be comprehensive and evidence-based.
- To prevent falls, there are three critical steps: screen older adults for fall risk, assess modifiable risk factors, and intervene to reduce the identified risk using evidence-based strategies.
- Cross-sector collaboration should be central to fall prevention efforts. Multidisciplinary partnerships with community-based agencies, EMS agencies, first responders, social services, and healthcare institutions can provide additional resources and outreach channels and improve access to prevention and treatment among older adult populations.
- Educating community leaders and policymakers on fall burden and prevention is essential to ensuring sufficient support for effective and integrated fall prevention efforts.
- Program monitoring and evaluation should be built into program planning from the start to ensure program fidelity and encourage sustainability.

References

- ¹ Anderson, L., Goodman, R., Holtzman, D., Posner, S., & Northridge, M. (2012, March). Aging in the United States: Opportunities and challenges for public health. Retrieved November 03, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3487684/>
- ² Ortman, J. M., Velkoff, V. A., & Hogan, H. (2014). An aging nation: the older population in the United States (pp. 25-1140). Washington, DC: United States Census Bureau, Economics and Statistics Administration, US Department of Commerce.
- ³ Pichora-Fuller, M., Mick, P., & Reed, M. (2015, August). Hearing, Cognition, and Healthy Aging: Social and Public Health Implications of the Links between Age-Related Declines in Hearing and Cognition. Retrieved November 03, 2020, from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4906310/>
- ⁴ Panel on Prevention of Falls in Older Persons, American Geriatrics Society, & British Geriatrics Society (Eds.). (2010). Prevention of Falls in Older Persons: AGS/BGS Clinical Practice Guide (pp. 1-61, Publication). American Geriatrics Society. Retrieved November 24, 2020, from https://geriatricscareonline.org/ContentAbstract/updated-american-geriatrics-societybritish-geriatrics-society-clinical-practice-guideline-for-prevention-of-falls-in-older-persons-and-recommendations/CL014/CL014_BOOK003
- ⁵ Centers for Disease Control and Prevention. (2020, July 01). WISQARS (Web-based Injury Statistics Query and Reporting System)|Injury Center. CDC. Retrieved November 13, 2020, from <http://www.cdc.gov/injury/wisqars>
- ⁶ 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(27):875–881. DOI: <http://dx.doi.org/10.15585/mmwr.mm6927a5>
- ⁷ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2020, July 01). WISQARS (Web-based Injury Statistics Query and Reporting System)|Injury Center|CDC. Retrieved November 03, 2020, from <https://www.cdc.gov/injury/wisqars/index.html>
- ⁸ Florence, C. S., Bergen, G., Atherly, A., Burns, E., Stevens, J., & Drake, C. (2018). Medical Costs of Fatal and Nonfatal Falls in Older Adults. *Journal of the American Geriatrics Society*, 66(4), 693-698. doi:10.1111/jgs.15304.
- ⁹ Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. (2020, July 01). WISQARS (Web-based Injury Statistics Query and Reporting System)|Injury Center|CDC. Retrieved November 03, 2020, from <https://www.cdc.gov/injury/wisqars/index.html>.
- ¹⁰ Burns E, Kakara R. Deaths from Falls Among Persons Aged ≥65 Years—United States, 2007–2016. MMWR Morb Mortal Wkly Rep 2018;67:509-514. DOI: <http://dx.doi.org/10.15585/mmwr.mm6718a1>.
- ¹¹ Ibid.
- ¹² Hayes, W. C., Myers, E. R., Morris, J. N., Gerhart, T. N., Yett, H. S., & Lipsitz, L. A. (1993). Impact near the hip dominates fracture risk in elderly nursing home residents who fall. *Calcified Tissue International*, 52(3), 192-198. doi:10.1007/bf00298717.
- ¹³ Parkkari, J., Kannus, P., Palvanen, M., Natri, A., Vainio, J., Aho, H., . . . Järvinen, M. (1999). Majority of Hip Fractures Occur as a Result of a Fall and Impact on the Greater Trochanter of the Femur: A Prospective Controlled Hip Fracture Study with 206 Consecutive Patients. *Calcified Tissue International*, 65(3), 183-187. doi:10.1007/s002239900679.
- ¹⁴ Taylor CA, Bell JM, Breiding MJ, Xu L. Traumatic Brain Injury–Related Emergency Department Visits, Hospitalizations, and Deaths—United States, 2007 and 2013. *MMWR Surveill Summ* 2017;66(No. SS-9):1–16. DOI: <http://dx.doi.org/10.15585/mmwr.ss6609a1>.
- ¹⁵ Ibid.
- ¹⁶ U.S. Preventive Services Task Force. (2017, September 26). Draft Recommendation Statement: Falls Prevention in Community-Dwelling Older Adults: Interventions: United States Preventive Services Taskforce. Retrieved December 09, 2020, from <https://www.uspreventiveservicestaskforce.org/uspstf/document/draft-recommendation-statement/falls-prevention-in-older-adults-interventions>
- ¹⁷ Ambrose, A. F., Paul, G., & Hausdorff, J. M. (2013). Risk factors for falls among older adults: a review of the literature. *Maturitas*, 75(1), 51–61. <https://doi.org/10.1016/j.maturitas.2013.02.009>.
- ¹⁸ Guirguis-Blake, J. M., Michael, Y. L., Perdue, L. A., Coppola, E. L., & Beil, T. L. (2018). Interventions to Prevent Falls in Older Adults. *Jama*, 319(16), 1705. doi:10.1001/jama.2017.21962.
- ¹⁹ Di Lorito, C., Long, A., Byrne, A., Harwood, R. H., Gladman, J. R., Schneider, S., ... & van der Wardt, V. (2020). Exercise interventions for older adults: A systematic review of meta-analyses. *Journal of Sport and Health Science*.
- ²⁰ Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L. M., & Lamb, S. E. (2012). Interventions for preventing falls in older people living in the community. *Cochrane database of systematic reviews*, (9).
- ²¹ Li, F., Harmer, P., Fisher, K. J., McAuley, E., Chaumeton, N., Eckstrom, E., & Wilson, N. L. (2005). Tai Chi and fall reductions in older adults: a randomized controlled trial. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 60(2), 187-194.
- ²² Shubert, T. E. (2011). Evidence-based exercise prescription for balance and falls prevention: a current review of the literature. *Journal of geriatric physical therapy*, 34(3), 100-108.

- ²³ Martin, J. T., Wolf, A., Moore, J. L., Rolenz, E., DiNinno, A., & Reneker, J. C. (2013). The Effectiveness of Physical Therapist–Administered Group-Based Exercise on Fall Prevention: A Systematic Review of Randomized Controlled Trials. *Journal of geriatric physical therapy*, 36(4), 182-193.
- ²⁴ Kirzinger, A., Neuman, T., Cubanski, J., Brodie, M. (2019). Data Note: Prescription Drugs and Older Adults. Kaiser Family Foundation. Retrieved from: <https://www.kff.org/health-reform/issue-brief/data-note-prescription-drugs-and-older-adults/>
- ²⁵ Ibid.
- ²⁶ Leipzig, R. M., Cumming, R. G., & Tinetti, M. E. (1999). Drugs and falls in older people: a systematic review and meta-analysis: I. Psychotropic drugs. *Journal of the American Geriatrics Society*, 47(1), 30-39.
- ²⁷ Chen, Y., Zhu, L. L., & Zhou, Q. (2014). Effects of drug pharmacokinetic/pharmacodynamic properties, characteristics of medication use, and relevant pharmacological interventions on fall risk in elderly patients. *Therapeutics and clinical risk management*, 10, 437.
- ²⁸ Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L. M., & Lamb, S. E. (2012). Interventions for preventing falls in older people living in the community. *Cochrane database of systematic reviews*, (9).
- ²⁹ Campbell, A. J., Robertson, M. C., Gardner, M. M., Norton, R. N., & Buchner, D. M. (1999). Psychotropic medication withdrawal and a home-based exercise program to prevent falls: a randomized, controlled trial. *Journal of the American geriatrics society*, 47(7), 850-853.
- ³⁰ Iyer, S., Naganathan, V., McLachlan, A. J., & Le Conteur, D. G. (2008). Medication withdrawal trials in people aged 65 years and older. *Drugs & aging*, 25(12), 1021-1031.
- ³¹ Ferreri SP, Blalock SJ, Robinson JM, Renfro CP, Busby-Whitehead J, Burns ER, Haddad Y. STEADI-Rx Older Adult Fall Prevention Guide for Community Pharmacists. Atlanta, GA: National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, 2020.
- ³² Lord, S. R., Menz, H. B., & Sherrington, C. (2006). Home environment risk factors for falls in older people and the efficacy of home modifications. *Age and ageing*, 35(suppl_2), ii55-ii59.
- ³³ Gillespie, L. D., Robertson, M. C., Gillespie, W. J., Sherrington, C., Gates, S., Clemson, L. M., & Lamb, S. E. (2012). Interventions for preventing falls in older people living in the community. *Cochrane database of systematic reviews*, (9).
- ³⁴ Pynoos, J., Steinman, B. A., & Nguyen, A. Q. (2010). Environmental assessment and modification as fall-prevention strategies for older adults. *Clinics in geriatric medicine*, 26(4), 633-644.
- ³⁵ Panel on Prevention of Falls in Older Persons, American Geriatrics Society and British Geriatrics Society. (2011). Summary of the updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *Journal of the American Geriatrics Society*, 59(1), 148-157.
- ³⁶ Close, J. C. (2001). Interdisciplinary practice in the prevention of falls—a review of working models of care. *Age and Ageing*, 30(suppl_4), 8-12.
- ³⁷ Clemson, L., Cumming, R. G., Kendig, H., Swann, M., Heard, R., & Taylor, K. (2004). The effectiveness of a community-based program for reducing the incidence of falls in the elderly: A randomized trial. *Journal of the American Geriatrics Society*, 52(9), 1487-1494.
- ³⁸ Goodwin, V. A., Abbott, R. A., Whear, R., Bethel, A., Ukoumunne, O. C., Thompson-Coon, J., & Stein, K. (2014). Multiple component interventions for preventing falls and fall-related injuries among older people: systematic review and meta-analysis. *BMC geriatrics*, 14(1), 1-8.
- ³⁹ Ibid.
- ⁴⁰ Li, F., Eckstrom, E., Harmer, P., Fitzgerald, K., Voit, J., & Cameron, K. A. (2016). Exercise and fall prevention: narrowing the research-to-practice gap and enhancing integration of clinical and community practice. *Journal of the American Geriatrics Society*, 64(2), 425-431.
- ⁴¹ Quatman, C. E., Mondor, M., Halweg, J., & Switzer, J. A. (2018). Ten years of EMS fall calls in a community: an opportunity for injury prevention strategies. *Geriatric orthopaedic surgery & rehabilitation*, 9, 2151459318783453.
- ⁴² Kizer, K. W., Shore, K., & Moulin, A. (2013). Community paramedicine: A promising model for integrating emergency and primary care.
- ⁴³ Ibid.
- ⁴⁴ Phelan, E. A., Herbert, J., Fahrenbruch, C., Stubbs, B. A., & Meischke, H. (2016). Coordinating care for falls via emergency responders: a feasibility study of a brief at-scene intervention. *Frontiers in public health*, 4, 266.
- ⁴⁵ Logan, P. A., Coupland, C. A., Gladman, J. R., Sahota, O., Stoner-Hobbs, V., Robertson, K., ... & Avery, A. J. (2010). Community falls prevention for people who call an emergency ambulance after a fall: randomised controlled trial. *Bmj*, 340, c2102.
- ⁴⁶ Centers for Disease Control and Prevention. (2020, July 01). WISQARS (Web-based Injury Statistics Query and Reporting System)|Injury Center. CDC. Retrieved November 13, 2020, from <http://www.cdc.gov/injury/wisqars>
- ⁴⁷ Ibid



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