

Aging Well

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Going Gray

"Getting older is a fascinating thing. The older you get, the older you want to get."

Keith Richards, 64



Successful Strategies for Fall Prevention

By Athan G. Bezaitis

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Older adults can fall anywhere, but they most often fall inside, outside, or near the home. Best prevention approaches include home modification, medical assessment and management, and progressive exercise regimens.



Pop quiz: What's the common thread among these people? Actor William Holden. Comedian George Burns. Publisher Katherine Graham. Journalist David Brinkley. Literary legend Kurt Vonnegut, Jr.

Answer: They all died from complications of a fall. No surprise, if you read this article's title. But how many of these incidents did you know about before now?

The facts are pretty self-explanatory: More than one of every three adults aged 65 and older falls each year. One in 10 will suffer a serious injury such as a broken hip. More than 40% of those hospitalized from hip fractures cannot live independently and will never return home.

Falls are also the leading cause of death among this age group, accounting for 13,000 fatalities and 1.8 million hospital visits annually. In 2003, the total direct cost for falls for this group was approximately \$27.3 billion. By 2020, it's expected to reach \$43.8 billion.

And the most ironic fact? Fifty-five percent of falls occur in the home, and most can be avoided by making some changes in a person's living space.

Unknown, Untackled, Unfunded

More irony: All the deaths listed above have done little to increase awareness of falls among older adults. Nationwide, the fall prevention infrastructure is a disparate network of community initiatives acting without cohesiveness. Existing programs vary widely by population, location, service provided, and funding.

And despite the need, there has been no national legislation enacted establishing fall prevention measures. This year, the Safety of Seniors Act of 2007 passed unanimously in the Senate but stalled in the House. The bill authorizes new programs to help prevent falls among older adults through public education, research, and safety demonstrations.

"The cost of falls to the healthcare system is staggering, yet very little is being done on a large-scale level to increase public consciousness," says Jon Pynoos, PhD, codirector of the Fall Prevention Center of Excellence (FPCE), a partnership of representatives from the University of Southern California, California State Fullerton, the VA Greater Los Angeles Healthcare System, the California Department of Public Health, and the David Geffen School of Medicine at the University of California, Los Angeles (UCLA). "Research shows that through an improved understanding of the risks and by carrying out preventative measures, at least 25% to 30% of falls can be prevented. On a small level, successful interventions have been conducted in physicians' offices, patient homes, hospitals, nursing homes, senior centers, and specialized research centers."

Pynoos believes a social marketing campaign similar to those that have raised awareness about drunk driving and smoking could be effective in promoting fall prevention but notes that the core group of advocates—academics, medical professionals, caregivers, and policymakers—hasn't been able to generate the necessary funding and resources. "The challenge ahead will be to coordinate, expand, and provide stable funding to establish model programs that can be replicated and sustained throughout California and throughout the country," says Pynoos.

In the mainstream media, the topic gets little coverage with the exception of isolated cases of high-profile victims, what Pynoos calls famous fallers. "A smattering of editorials generally appears and the cause for increased collective consciousness rises, but it's generally short-lived," he says. "What's important to understand is that falls don't discriminate."

Whys and Wheres

Risk levels for falling increase with age. Over time, sensory impairments, muscle and skeletal disorders, and chronic diseases make people increasingly susceptible. The rates of fall injuries for adults 85 and older are four to five times greater than those of adults 65 to 74.

Laurence Rubenstein, MD, MPH, is codirector of the UCLA/VA Greater Los Angeles Healthcare System and a FPCE codirector. His research focuses on preventive geriatric care, geriatric assessment technology, fall prevention and treatment, and physical instability in older people.

Rubenstein has found that extrinsic risk factors, such as environmental hazards, account for the majority of falls. These can be within the home or in a public place. Intrinsic risk factors such as gait disturbance, dizziness, vertigo, drop attack (sudden spontaneous falls), and confusion are also common causes. For example, lower-extremity muscle weakness makes an individual four times more likely to fall.

There's also a recurrence factor; those who have fallen once are three times more likely to fall again. "As the result of a fall, many people develop a fear of falling again which causes them to limit their activities, leading to reduced mobility and physical fitness," Rubenstein says. "Use of multiple medications has also been a risk factor strongly associated with an increased possibility of falls, particularly psychotropic medications, cardiac drugs, and diuretics."

He adds that nursing home residents are twice as likely to fall as elders living in the community. As many as three out of four residents fall each year, and many incidents go unreported. "The main reason for the higher fall rates is that typical nursing home residents are much older and frailer than most home-living elders," he says. "Controlling for illness, age, and frailty, nursing homes are actually probably safer because of a more controlled environment and staff supervision."

In nursing homes, Rubenstein has found muscle weakness and walking or gait problems to be the most common causes of falls, along with the use of multiple medications and the difficulty of frail patients moving from one place to the next.

Outside of institutional care and the 55% of fall injuries occurring in the home, an additional 23% occur outside or near the house.

Effective Prevention Strategies

In 1973, M. Powell Lawton defined the fundamental principle of home modification as the attempt to establish equilibrium between a person whose capabilities have declined and environmental demands. Not only do home modifications contribute to fall prevention, but they also facilitate caregiving, increase independence, and make tasks easier for elders in need. Home modifications also help people age in place. Studies show 80% of older Americans want to stay in their homes.

Around the home, common-sense precautions and modifications can help reduce potential falling hazards. Increasing lighting, removing impeding objects such as telephone cords and books, and clearing general clutter can be easy and effective means of improving safety. Further adjustments such as installing grab bars next to toilets, tubs, showers, and stairs, along with nonslip mats and lightweight curtains or shades to reduce glare, can also be effective.

Effective home modifications also incorporate universal design, a form of accessibility developed to help everyone, not only those at risk or with disabilities. Examples would include cabinets with pullout shelves, kitchen counters at several heights to accommodate different tasks and postures, light switches with large flat panels rather than toggle switches, and wider interior doors and hallways.

But environmental precautions are just one facet of fall prevention. Research indicates that a multifactorial approach encompassing medical assessment and management and progressive exercise regimens are other essential components. The gold standard of fall prevention for highest-risk elders, according to Pynoos, involves assessment from three healthcare professionals.

"A doctor conducts a medical risk analysis; a physical therapist outlines an ideal exercise program; and an occupational therapist conducts home assessment and provides recommendations," he says. "Unfortunately, these can be very cost-intensive services."

Anna Nguyen, OTD, trains healthcare providers such as other occupational therapists and social workers about how to evaluate older adults' homes and make recommendations to decrease the risk of falling. She has found a collaborative effort between the healthcare provider and the individual seeking protection is the most effective means of getting an at-risk individual to make changes in how they interact with their home.

"Basic home modifications might look easy and appear to be relatively cost-effective for improving home safety, but it's not quite as simple as it seems because a person's home is very personal," she says. "What an objective assessor might perceive as hazardous, a person at risk of falling might find to be a precious possession. For example, throw rugs are a big deal. Sometimes people don't want cold feet, sometimes they cover a stain, sometimes they don't want to harm the original carpets because they're renting the property, and sometimes they add to décor or have sentimental value."

Nguyen advises setting priorities when assessing homes to increase the likelihood of the resident adopting recommendations. Often, at-risk individuals are reluctant to change established behavioral patterns. She recommends customizing modifications to suit their needs. Some people, she says, make a habit of accruing clutter. Tidying up their house one day doesn't mean it won't be littered with hazards the next.

"An assessment might advise a person to start using a step stool for reaching elevated objects, a night light for better vision in the dark, and getting rid of slippery throw rugs," she says. "In response, the client will say, 'No, the rugs stay.' Then I'll say, 'For \$20 at Target, you can get a double-sided rubber mat to secure the carpet, which will be much safer.'"

According to a 1999 report from the U.S. Department of Housing and Urban Development, approximately 1.14 million elder households with at least one functional limitation report an unmet need for home modifications. Yet, much like the fall prevention infrastructure, the home modification network has fractured funding and delivery systems. Medicare, Medicaid, and other government housing programs provide small government funds with strict eligibility criteria depending on geographic area and age.

Such financial constraints are a barrier Nguyen often encounters in adapting the home environment. More expensive modifications include installing chair lifts, bathroom remodels, widening doors, and adding ramps. While direct government funding is limited, home modification agencies such as the national nonprofit Rebuilding Together often use volunteers and donated supplies to retrofit homes free of charge for low-income homeowners. Along with reducing risk through home modification, a doctor provides a critical component of multifactorial prevention by reviewing medications, conducting vision tests, assessing gait, and inquiring about previous fall history.

Rubenstein advises testing of lower-extremity strength and joint function, looking for the presence of arrhythmias, and measuring postural changes in vital signs. He also recommends a neurological evaluation that analyzes assessment of lower-extremity peripheral nerves, focal deficits, vibration sense, and testing the cortical, cerebella, and extrapyramidal functions.

The "Get Up and Go" test is used to analyze previous fallers. Observing for instability, the patient rises from a chair without using his or her arms, walks 10 feet, turns around, walks back, and sits down again. If the whole process takes longer than 16 seconds, the individual is at a higher risk of falling again.

A doctor also advises on appropriate levels of exercise for at-risk patients. The majority of older adults don't exercise regularly, and 35% of people over 65 fail to participate in any leisurely physical activities. Many fallers at the highest risk stop exercising due to the fear of falling again. For those patients, a physical therapist should implement a customized plan of regular physical activities that includes progressive muscle strengthening, flexibility training, and exercise in order to maintain balance.

Exercise Works

Fall prevention exercise programs, produced by trained and certified professionals, also exist for elders. Debra Rose, PhD, is codirector of the FPCE and the Center for Successful Aging at California State University, Fullerton. Her research focuses on postural control and fall-risk reduction. "Activities designed to improve older adults' ability to process and integrate sensory information, anticipate and react quickly and efficiently to changes in task demands and the environment, allocate attention appropriately, and perform multidirectional and segmental coordination activities in a controlled manner will be particularly important components of any fall prevention program for at-risk older adults," she notes.

Rose also advises whole-body functional activities that focus on improving muscular endurance, strength, and power, particularly in the muscle groups that contribute to postural alignment and stability during gait, such as the ankle, knee, hip, and trunk.

With a doctor's approval, physical activities designed to improve aerobic endurance should also be included in any exercise program aimed at reducing fall risk. "Important physiological changes are taking place as early as the fifth decade of life, [such as] declines in muscle strength, bone density, and vision, that will have a negative long-term impact on physical function and the premature onset of disability if not addressed proactively," Rose says.

An effective fitness routine, she advises, should be about doing what is necessary to maintain a high level of independence and quality of life.

Programs Underway

In 2006, the FPCE implemented a novel study to meet the need for effective fall prevention programs that can be replicated and sustained. Called InSTEP (Increasing Stability Through Evaluation and Practice), the research initiative is in the process of developing fall prevention programs at six senior centers throughout Orange and Los Angeles counties. Participants are elders living in the six communities each center serves.

Still in its nascent phases, the program will incorporate the three essential fall-prevention components—medical assessment, physical activity, and home assessment and modification—for a period of 12 weeks. Upon completion of the programs, analysis will compare the effectiveness of high-, medium-, and low-intensity interventions to determine the most efficient and cost-effective levels of professional staff, time, and resources given to fall prevention measures.

Incorporating a plan that fits the area, Pynoos says, is the way to achieve sustainability. "The available resources of the surrounding community need to be taken into consideration when implementing fall prevention programs on the local level," he notes. "For example, the Irvine center chosen for the first high-intensity intervention is in close proximity to several universities and hospitals that provide access to healthcare professionals."

Discussion groups will also be organized to test behavioral changes such as program adherence, retention rates, and long-term involvement of older adults in fall prevention activities.

A Glance at the Model

A comparison of the differences in the physical activity component to be implemented at the three levels of intensity demonstrates how the experiment will work.

The high-intensity group will offer a private instructor to teach a balance and strength program, provide a home exercise plan, and establish a walking plan for older participants.

The medium-intensity program will offer a similar balance, strength, and aerobic endurance training regimen specifically targeted to reduce the risk of falling, plus encouragement to participate in a walking plan, but without the instructor or a formal home exercise regimen.

The low-intensity group will be offered either the group exercise or home exercise program but without a fall-risk component.

At the conclusion of the study, the sites will be analyzed based on changes in physical activity levels, functional performance, fall incident rates, and quality of life in order to determine the best preventative care. Follow-up data from each site will help to determine whether each program was successful in reducing fall risk factors and rates of falls.

"The goal is to help fortify the fall prevention infrastructure in California and develop evidence-based fall prevention models," Pynoos says. "InStep may seem like a baby step, but it's a foot forward in the right direction—a much-needed institutional shift towards preventing future falls."

— *Athan G. Bezaitis is a staff writer at the University of Southern California's Andrus Gerontology Center.*

Two Helpful Resources

- The Fall Prevention Center of Excellence recently published three fall prevention fitness guides with exercises selected by Debra Rose, PhD. Designed for ease of use, the calendar-style books incorporate text with large lettering and easy-to-follow images. The books are available at www.stopfalls.org.

- Rebuilding Together, headquartered in Washington, DC, is a national nonprofit group that links volunteers and communities to improve homes for low-income homeowners by providing free repair services for those with the greatest need. For more information, visit www.rebuildingtogether.org.

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