

James L. Holly, M.D.

Falls and Fractures in the Elderly

By James L. Holly, MD

Your Life Your Health

The Examiner

July 13, 2006

One third of community-dwelling elderly people fall each year, and this increases to one half in those who are institutionalized. **Definition of a fall** -- A fall is a sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor, or the ground, other than as a consequence of sudden onset of paralysis, epileptic seizure, or overwhelming external force.

About 6% of falls result in fractures. Frail elderly people, especially those with hip weakness, poor balance, urinary urge incontinence, and multiple medications, are at high risk. Some falls occur in patients with risk factors that are easily detected, such as visual impairment, poor mobility, disturbed gait, and sedative use. Screening for these factors can lead to early identification of risk and enable successful prevention programs. However, a recent systematic review identified more than 400 risk factors for falls, which makes screening challenging.

The home environment is the location of 55% of falls, and an additional 23% occur outside but in close proximity to the home. There seems to be an interaction between risk of falling and the home environment with environmental factors being implicated in 35% to 40% of falls. A fundamental point is that many hazards can be successfully modified. However, the perception of what constitutes a hazard is relative. For example, the familiar placement of otherwise cluttered furniture may be reassuring to an older person who has lived for decades in the same location.

Community-living people who have fallen or who have risk factors for falling should have their homes assessed for safety. There is also evidence that home safety assessment is not helpful for non-fallers or individuals whose fall risk is not known. For individuals with mental impairment living in the community, the potential benefit of multifactorial interventions that include a home safety evaluation is unknown. The evidence is good that individuals living in long-term care settings may reduce their fall risk with multifactorial interventions that include environmental evaluation and intervention. To the extent possible, the older person should be involved in the hazard-reduction process.

Exercise alone (with the exception of Thai chi, which improves balance) does not prevent falls in the general population. However, patients at increased risk of falling (and injuries from falls), such as patients who present to the emergency department with a fall and women over 80 years of age who have osteoporosis do benefit from exercise alone.

Patients should be targeted for multidisciplinary assessment and interventions, including a medical evaluation that encompasses checks for postural hypotension, vision, gait and balance, and medication review, with adjustment or elimination of medications felt to contribute to fall risk. If indicated, patients should be referred for occupational and physical therapy and a home safety evaluation.

Summary Points:

- Multifaceted interventions reduce falls in older people (those over 65)
- Home assessment of older people at risk of falls without referral or direct intervention is not recommended.
- Assessment of high risk residents in nursing homes with relevant referral is effective.
- Evidence from well designed, single trials shows that assessment and modification of risk factors of older people who have presented to an emergency department after a fall and the provision of hip protectors in residents of nursing homes are effective.

Benefit of interventions in various groups:

- Unselected groups — most exercise programs without other interventions do not reduce the incidence of falls in unselected older people living in the community.
- Selected group (women over 80) — individually tailored exercise program administered by a qualified professional reduce the incidence of falls in a selected high risk group living in the community.
- Selected group (mild deficits in strength and balance) — exercise program reduce the risk of falls in a selected group of older people living in the community.
- Balance training—T'ai chi classes with individual trainers can reduce the number of falls in older people.

Multifaceted interventions

Five trials tested multifaceted interventions. One trial combined:

- exercise sessions,
- daily walks,
- a home assessment with safety improvements, and
- group teaching sessions on prevention of falls.

A decrease in falls occurred within the intervention group but there were no differences in the number of falls requiring medical care. Another study targeted high risk patients and combined an assessment by nurse practitioners and physiotherapists with interventions targeted at several risk factors. The rate of falls was substantially reduced. Further analysis showed that interventions aimed at:

- postural hypotension

- gait
- balance
- transfers
- strength
- range of motion of the lower extremities

were most associated with a reduced incidence of falls. Another trial tested an assessment visit by a nurse, which aimed to increase physical and social activity. A significant reduction in rate of falls one year after the visit was found.

Successful fall intervention programs included:

- medical assessment
- home safety assessment and advice
- changes in prescribed drugs
- environmental changes
- tailored exercise
- training in transfer skills and gait
- referral of clients to relevant healthcare professionals according to need.

When offering multiple interventions, there is a case for targeting patients at high absolute risk of falls. A multifaceted program should consist of a core assessment and recommendations adapted to individual risk (for example, change of drugs and exercise training).

Programs that combine interventions (most studies include some form of exercise) reduce falls. The following specific factors to target are particularly effective in reducing falls: attention to postural hypotension, number of drugs, balance, transfers, and gait is particularly effective.

Assessment in the community

In one trial the intervention proved beneficial when people aged 75 years or over were assessed at home by trained lay volunteers. Visits for assessment at intervals of three or six months for three years prompted referral to the patient's doctor in response to an increase in a disability score. Referrals were also made to non-medical services such as meals on wheels and home helps. Three other trials studied assessment at home by a health professional to identify medical problems and environmental hazards. In another study, subjects received home safety assessment and education by a researcher. None of the four trials included referrals or active intervention, and none detected a reduction in number of falls or the incidence of fractures.

Another study implemented a medical assessment at the day hospital after discharge followed by an occupational therapy assessment at home, with direct intervention advice, education, and referral. The study showed a reduction in the number of falls over one year.

- Home assessment 1-- Home assessment of disability and education in the risk areas and referral to the patient's doctor reduces falls.
- Home assessment 2 -- Home assessment of risk and education in these areas without further referral does not reduce falls.
- Emergency assessment -- Identification of patients who attend accident and emergency departments after falls, with subsequent assessment of medical and occupational therapy and referral and follow up, reduces falls.

Residential settings

Four trials were based in residential settings: three studied prevention of falls and one the prevention of fractures with hip protection. Because the evidence is from "nursing homes," where residents have different levels of risk and fitness, it is probably applicable to a wide range of supervised residential settings.

Two studies concerned individual assessment of subjects at high risk followed by recommendations to their primary care physicians or nursing home staff, including changes to drugs and the environment. One of the studies showed a reduction in admissions to hospital when ambulatory residents were assessed within seven days of a fall and a non-significant reduction in rate of falls. The other study found a reduction in rates of falls after assessment and development of individual treatment plans along with education of staff caring for residents who had fallen in the past year and who had a deficit in one of four "safety domains." In another study, in which semi-independent residents of long stay nursing homes were given training in resistance, flexibility, balance, gait and transfers, there was no reduction in the incidence of falls.

One study found the use of external hip protectors beneficial in the prevention of hip fractures in residents of nursing homes. No fractures were sustained by residents wearing hip protectors when they fell, but compliance was a problem as it was in subsequent studies of hip protectors.

- All residents—non-selective exercise programs for residents of nursing homes do not reduce falls.
- High risk residents—assessment of residents after falls, with development of individual treatment plans and staff education, decreases falls.
- Hip protectors—neck of femur fractures are prevented by hip protectors being worn by residents of nursing homes.