Mobility, Factors and Facilitators: Falls Risk with Hip Fracture Focus

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MOBILITY

- Diminished independent mobility is a predictor of

  - Institutionalization

  - Falling

  - Dependence

  - Mortality

- It is inversely associated with Quality of life and Health status.

MOBILITY

- **Mobility limitation is prevalent in 44% of older adults.**

- **87.6% experience impaired mobility for longer than 1 year.**

Mobility

- **Mobility in daily life depends not only on an intact sensorimotor system but also on intact cognition and psychosocial factors.**

- **Studies have shown that reduced mobility in older adults is associated with:**
  - **low cognitive status**
  - **reduced visual attention**
  - **self-efficacy beliefs**
  - **perceived help availability**

- **A person's scores on standardized cognitive tests are poorly related to their cognitive performance in real life.**

Risk Factors for Mobility Limitation in Community-Dwelling Older Adults

- A social ecological model was used as a framework to understand mobility limitation where multiple levels of personal and environmental factors are interrelated.

- This model also recommended by the Institute of Medicine as levels of influence essential to health promotion:
  - Intrapersonal, Interpersonal, Environmental, and Organizational risk factors.

- These are all related to mobility limitation in community-dwelling older adults.

Risk Factors for Mobility Limitation in Community-Dwelling Older Adults: A Social Ecological Perspective
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Volume 29, Issue 2, March–April 2008, Pages 133-140

Intrapersonal risk factors

Include:

- **Advanced age**
- **Female gender**
- **Low socioeconomic status**
- **Comorbidity**
- **Lack of motivation (i.e., dependent personality decreased self-efficacy)**
- **Lifestyle factors (i.e., sedentary lifestyle, smoking, obesity)**
- **Physiological factors (i.e., vitamin D deficiency, inflammation, poor nutritional status).**

Interpersonal risk factors

Include:

- **Weak social networks**
- **Limited social activities**
- **Environmental challenges such as an inconvenient home environment**
- **Lack of availability of services in their community**
- **Lack of organizational resources stemming from social policy**

Environmental Factors

Older adults' environmental resources are crucial preconditions for mobility.

- **Housing conditions, accessibility, and housing satisfaction.**
- **Availability and access to the services in local area (i.e., food store, pharmacy, bank).**
- **Physical conditions such as the season of the year, availability of physical activity programs, neighborhood characteristics (i.e., presence of a sidewalk, enjoyable scenery), air pollution, and traffic safety.**

Organizational/Policy Factors

- **Organizational and policy factors such as urban planning and transportation regulation may affect mobility limitation.**

- **Social policy is significantly related to mobility level in older adults. For example, reimbursement policy for mobility aid devices (e.g., walkers, canes, wheelchairs) through Medicare may enhance the level of mobility for older adults**

Mobility Assessments

- Timed Up-and-Go test
- Performance-Oriented Mobility Assessment
- Elderly Mobility Scale (EMS)
- Other common approaches are assessments based upon Gait measures and Balance tasks

These assessments are reliable but

- Not clear how well persons' test scores are correlated with their mobility in daily life.
- Performance in the laboratory can be substantially different from those in real life.

WHO and ICF

- The International Classification of Functioning, Disability and Health (ICF) is introduced by the World Health Organization (WHO).

- Within the ICF framework, the above work indicates that the known age-related decrease in the capacity (as indicated by the tests) to be mobile may poorly predict actual mobility performance.

Potential intervention strategies

Focused on modifiable risk factors may include:

- **Lifestyle modifications**
- **Social networking programs**
- **Enhancing awareness of environmental and organizational resources in the community**

Assessment Guideline and Intervention Strategies for Mobility Limitation in Older Adults Based on Social-Ecological Framework

Assessment/Screening	Care Approach/Patient Education Strategies
Intrapersonal factors	
1. Demographic factors (i.e. older age, female gender, single marital status, low socioeconomic status)	Consideration in identifying high risk groups
2. Co-morbid conditions	The need for active management of chronic conditions (i.e. pain, heart disease)
3. Motivational factors (i.e. lack of motivation for staying physically active, low self-efficacy)	Positive role of psychosocial interventions (i.e. empowering education, social support, motivational interview, verbal encouragement)
4. Smoking	Participation in smoking cessation program
5. Obesity	Participation in weight control program
6. Physical inactivity	Encouraging physical activity/exercise program
7. Vitamin D deficiency	Benefits of vitamin D supplementation therapy
8. Inflammatory condition	The need for active treatment for inflammatory diseases
9. Poor nutritional status	Encouraging adequate nourishment
10. Reduced muscle mass	Participation in community resistance training program (muscle strength, volume, flexibility)

Assessments and Strategies (Contd)

Assessment/Screening 2.	Care Approach/Patient Education Strategies
Interpersonal factors	
1. High interpersonal dependency	Consideration in identifying high risk group
2. Lack of social relations & participation	Benefits of social networking program, social support, encouragement for active social participation
Environmental factors	
1. Inconvenient indoor environment (i.e. lack of flat surface, inadequate sink height)	Raising awareness of environmental challenges, exploration for preference of in-house environment and possibility of relocation
2. Lack of availability of services in local area	Discussion on accessibility to services in local area, provide resources for local transportation regulation
3. Feeling of insecurity	Exploration of neighborhood characteristics, providing local security resources

Causes of Mobility decline

- **Sarcopenia**
- **Metabolic syndrome (a distinct risk factor for mobility decline)**

D.G. Blazer, C.F. Hybels, G.G. Fillenbaum: Metabolic syndrome predicts mobility decline in a community-based sample of older adults: J Am Geriatr Soc, 54 (2006), pp. 502-506

Strategies

- **Maintaining healthy lifestyles may reduce the onset of mobility limitation in old age.**
- **Independent mobility is therefore a key to successful aging.**

Facilitator
Physical Activity (PA)

Regular PA in older people is associated with increased functional independence.

Benefits:

- **Increased strength and endurance**
- **Reduced risk of Falls and Fractures**
- **Cardiovascular events**
- **Decrease in Pain and disability from arthritis,**
- **Decrease symptoms of Depression and Anxiety**
- **Maintenance of Cognitive function**

Maula et al. Use it or lose it: a qualitative study of the maintenance of physical activity in older Adults: BMC Geriatrics (2019) 19:349

Physical Facilitators and Barriers for Physical Activity(PA)

People are more likely to engage in and maintain PA when they positively evaluate its benefits.

Facilitators (via benefits):

- Improvements in suppleness

- Balance

- Mobility

- Strength and confidence related to a reduction in falls.

Barriers:

- Deterioration in physical health

Arthritis, URIs or side effects of medications for HTN, DM etc..).

Other Factors for PA

- Social facilitators and barriers
- Psychological
- Environmental

Hip fractures and Falls

According to the American Academy of Orthopedic Surgeons,

- Every year, more than 300,000 people in the U.S. suffer a hip fracture, and most in individuals 65 years or older who are injured in household or community falls.
- It usually entails a low velocity mechanism, from a fall from standing or a fall from a chair.
- Most hip fractures require surgery, usually within one to two days of injury.
- Surgery is required to relieve acute pain secondary to the fracture and to allow the patient begin mobilization.
- Osteoporosis and advancing age are the major risk factors 75% in women.

- Regular weight-bearing exercise helps to prevent a hip fracture.

Factors that can prevent hip fractures

- Vitamin D supplements.
- Smoking prevention
- Reducing alcohol intake
- Increasing activity
- Engaging in fall prevention programs
- Leading a healthy and active life style

Prevention is of vital importance

Consequences

- Loss of independence and mobility.
- Deterioration in the quality of life.
- Potential for Institutionalization.

Rehabilitation after hip surgery is crucial.

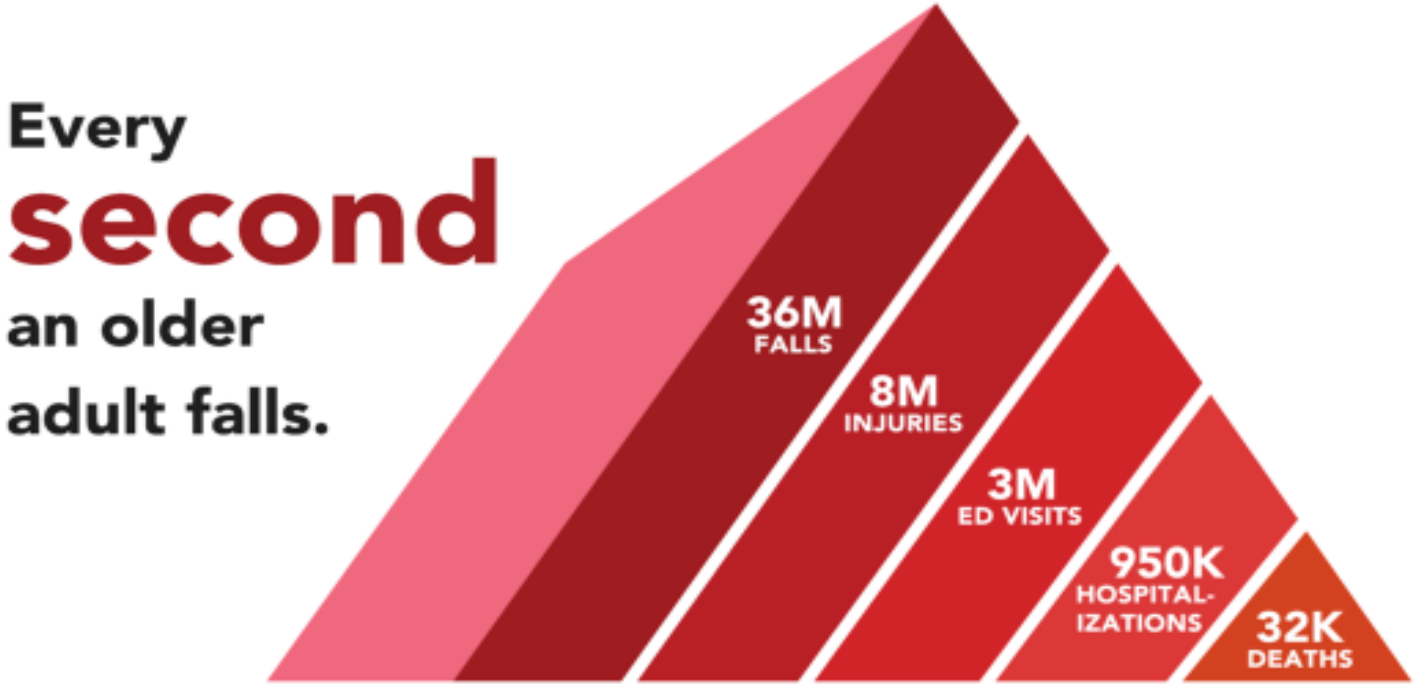
Immediately after surgery, the patient must begin working with physical and occupational therapy.

Falls and Hip fractures

- Falls Are Serious and Costly
- One out of five falls causes a serious injury such as fracture or a head injury
- Each year, 3 million older people are treated in emergency departments for fall injuries.
- Over 800,000 patients a year are hospitalized for a head injury or hip fracture from a fall.
- Each year at least 300,000 older people are hospitalized for hip fractures
- More than 95% of hip fractures are caused by falling, usually by falling sideways.
- Falls are the most common cause of traumatic brain injuries (TBI)
- Falls are fall injuries increase the risk of nursing home placement
- In 2015, the total medical costs for falls totaled more than $50 billion
- Medicare and Medicaid shouldered 75% of these costs

- Fall death rates increased about 30% between 2009 and 2018

Falls Are Common



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

References: (1,2)

Risk factors for falls

Most people who fall, even if they're not injured, become afraid of falling. This fear may cause a person to cut down on their everyday activities. When a person is less active, they become weaker and this increases their chances of falling.

Lower body weakness

Vitamin D deficiency

Difficulties with walking and balance

Use of medications, such as Tranquilizers, Sedatives, or Antidepressants. Even some Over-the-counter medications can affect balance.

Vision problems

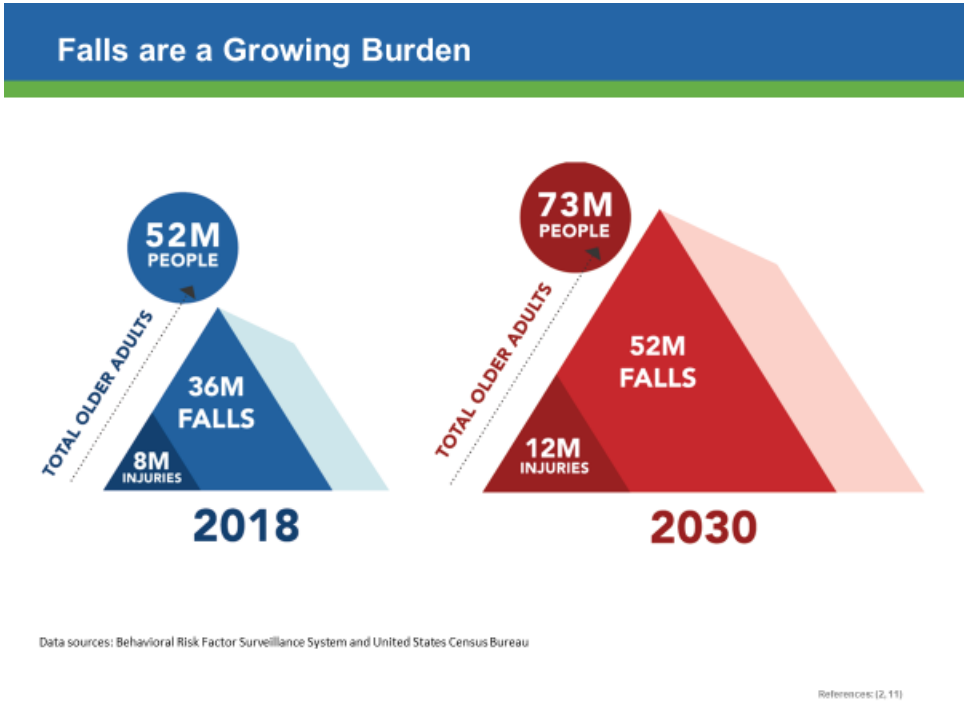
Foot pain or poor footwear

Home hazards

- **broken or uneven steps, and**
- **throw rugs or clutter that can be tripped over.**

Most falls are caused by a combination of risk factors

Burden of Falls



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

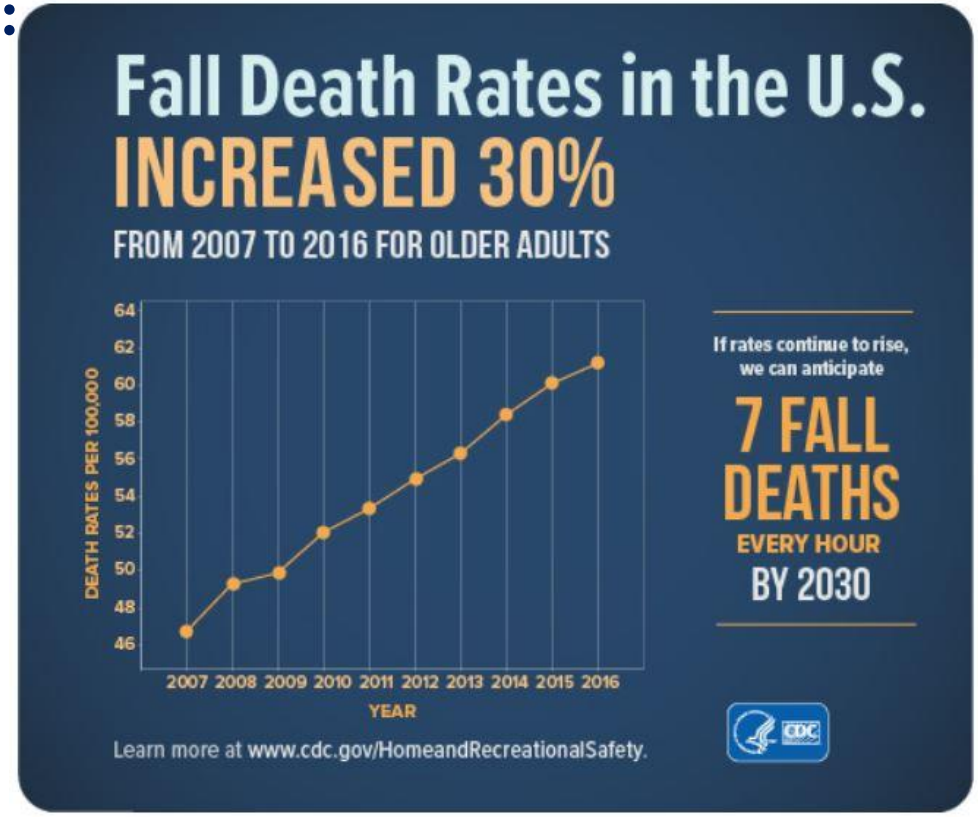
1	2	3
Fall	Motor Vehicle (Traffic-related)	Unspecified

Data source: National Vital Statistics System

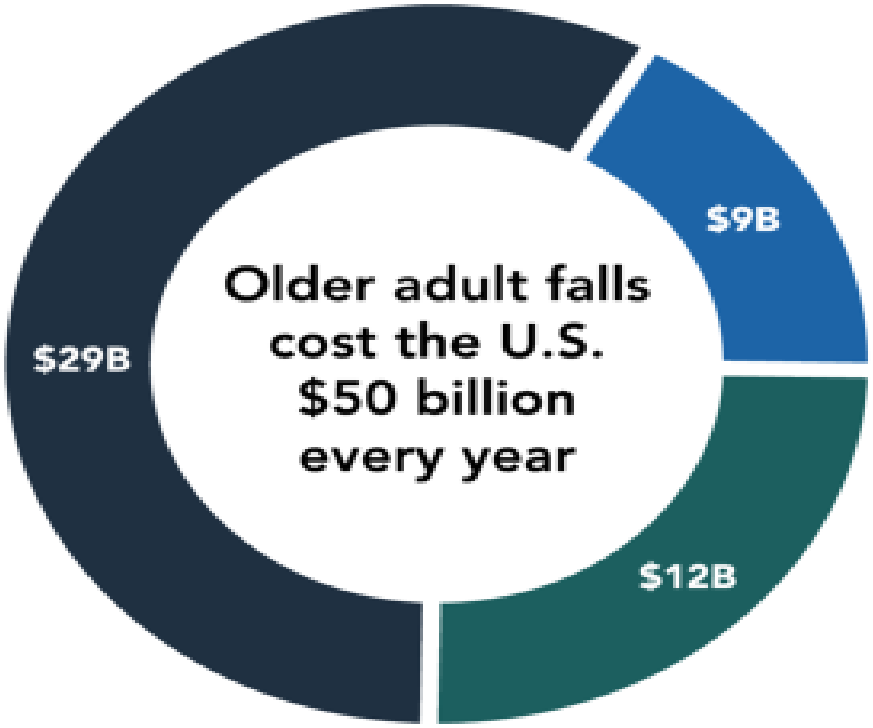
Reference:(1)

Falls

Death rates:



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.*

Reference: (7)

Economics of Falls

Falls Are Costly (Continued)

- Average hospital visit for a fall costs $30,000
- Fall-related injuries are a leading cause of hospital readmission

Approximate healthcare spending for falls by type of service		
Type of service	Spending due to falls	Amount spent
Home health services, long-term care facilities, and other medical products	12%	$ 29 billion
Physician, other provider	6%	$ 11 billion
Hospital	4%	$ 13 billion
Prescription drugs	2%	$ 2 billion
Dental	2%	$ 0.4 billion

References: (7-10)

Stopping Elderly Accidents, Deaths, and Injuries (STEADI)

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
  - STEADI offers tools and resources to help healthcare providers **Screen**, **Assess**, and **Intervene** to reduce fall risk.

References: (12,13)

Benefits of a STEADI-based fall prevention Program

Use STEADI to:

1. **Reduce fall–related hospitalizations**
2. **Avert Healthcare costs**
3. **Improve the lives and Independence of your older patients**

Resources

STEADI Tools & Resources: Providers

References: (13,16)

STEADI Tools & Resources: Patients and Caregivers

References: (13,16)

Resources

Learn more about older adult fall prevention and STEADI resources at www.cdc.gov/steadi

Coordinated Care Plan to prevent falls

Thank you!