

Falls and Fall Prevention: A Clinical Perspective

Elizabeth A. Phelan, MD, MS

Associate Professor

Medicine / Gerontology and Geriatric Medicine

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Objectives

Know and understand:

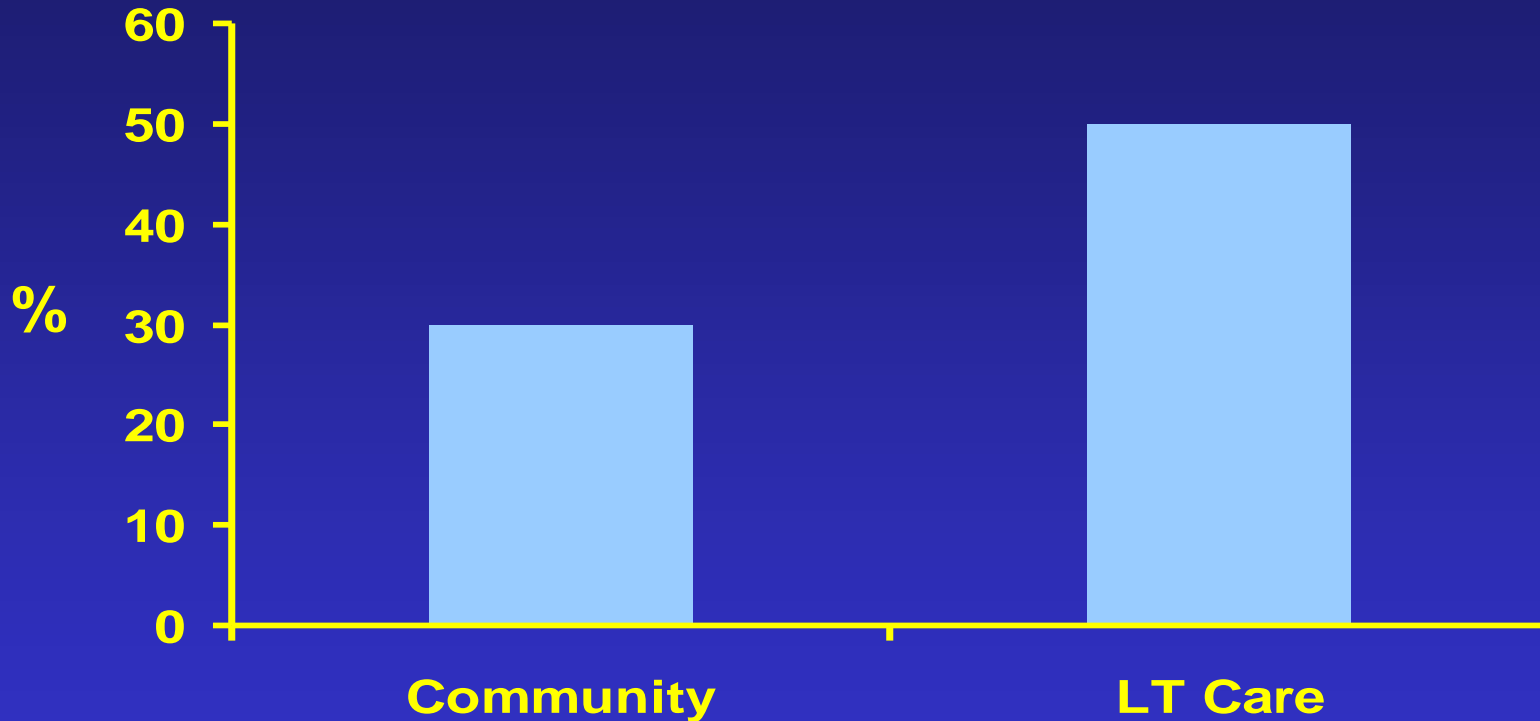
- How often falls occur**
- Consequences of falls**
- Why falls occur**
- How falls may be prevented**

Falls

Definition: coming to rest inadvertently on the ground or lower level

- Excludes falls due to an acute event (seizure, stroke, syncope, overdose)
- One of most common “geriatric syndromes”
- **NOT** a normal part of aging!

Epidemiology of Falls



Each year ~1/3 of community-dwelling persons aged ≥ 65 , and 1/2 of residents of long-term-care facilities, experience falls

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Fall-Related Mortality

- Leading cause of injury deaths among elders (~**15,000** nationwide in 2004)
- Number of fatal falls doubled from 1993-2003
- Death rates rise with increasing age
 - greatest increase after age 79
- Men more likely to die from a fall; reasons unclear

Fall-Related Morbidity

- Most falls result in some injury
- **10%** of falls result in *serious* injury
 - Head injury
 - Fractures
- Most serious and disabling fracture: *hip*
 - 20% die within a year after hip fracture
 - 25% in nursing home at one year

Fall-Related Cost of Care

- Total direct costs of fall-related injury care in 2000: ***\$19 billion***
- National annual cost of fall-related injuries:
 - *By 2020: \$43.8 billion*
 - *By 2040: \$240 billion*

Adverse Sequelae of Falls

- **Loss of independence**
- **Diminished quality of life**
- **Fear of falling**
- **Activity restriction**
- **Functional decline**
- **Permanent nursing home residence**

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Falls Occur Due to a Combination of Reasons

Intrinsic Factors

Age related changes

Chronic conditions

LE weakness

Balance problems

Extrinsic Factors

Medications

Footwear

Alcohol

Environmental factors

Assistive device

FALLS

Intrinsic Factors: Age Related Changes in Gait and Balance

- **Increased postural sway**
- **Decreased step height**
- **Decreased proprioception**
- **Slowed righting reflexes**

Intrinsic Factors: Age Related Changes in Vision

- **Pupil decreases in diameter and becomes less responsive to variations in light**
 - **Harder to see in dim light**
 - **Longer time to adapt to changes in illumination (e.g., dark to light)**
- **Lens of the eye loses elasticity and becomes thicker**
 - **Harder to see up close**
 - **Harder to see contrast and sharpness of objects**
- **Lens of the eye yellows**
 - **Reduces contrast between colors**

Extrinsic Factors: Medications

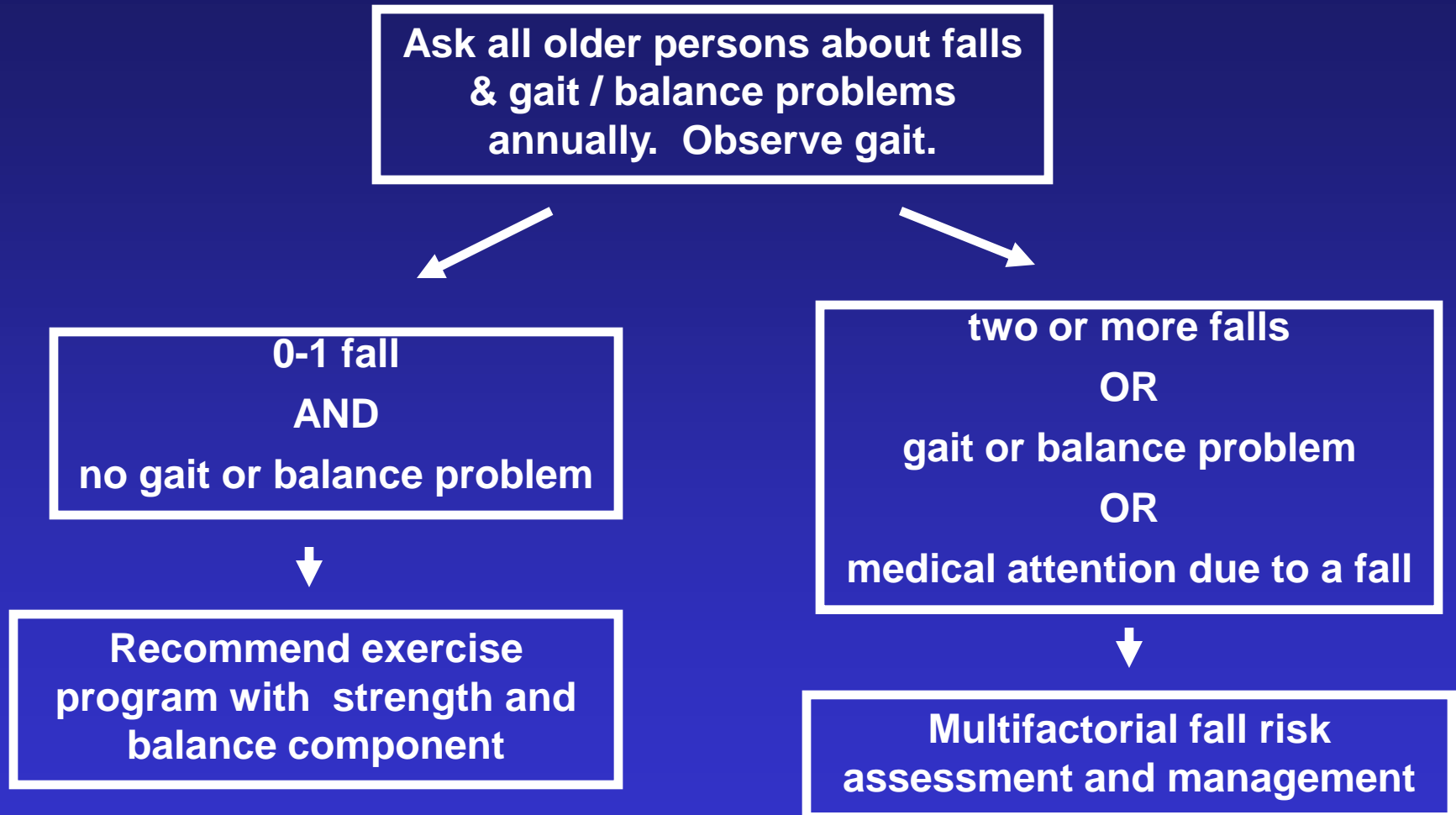
- **Psychoactive medications**
 - Benzodiazepines
 - Antidepressants
 - Antipsychotics
 - Anti-epileptics
 - Anticholinergic side effects (benadryl, atarax)
- **Blood pressure lowering agents**

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Clinical Approach to Fall Prevention



AGS/BGS/AAOS Panel. *J Am Geriatr Soc* 2001;49;664.

Tinetti ME. *New Engl J Med* 2003;348:1.

Multifactorial Fall Risk Assessment and Management

- Multifactorial risk assessment *with* longitudinal follow-up is *most* effective approach (reduces falls by *30-40%, NNT=20*)
 - Educate about fall prevention
 - Encourage exercise (gait retraining, muscle strengthening, balance exercises)
 - Update vision exam
 - Stop medications that increase fall risk
 - Identify and treat postural hypotension
 - Modify environment, footwear, assistive device

Multifactorial Fall Risk Assessment and Management

- **Management goals:**
 - ✓ **Reduce chances of falling**
 - ✓ **Prevent injuries if and when a fall occurs**
 - **Environmental modifications**
 - **Personal alert systems**
 - **Bone strengthening interventions**
 - **Self-efficacy enhancing interventions**

Other Outcomes of Multifactorial Approach to Fall Prevention

- Reduce fear of falling
- Improve physical functioning
- Enhance falls self-efficacy
- No effect on mortality
- No effect on nursing home placement
- No published data on HRQOL or physical activity

Zijlstra GAR et al. *J Am Geriatr Soc* 2007;55:603-15.

Hill KD et al. *J Am Geriatr Soc* 2008;56:600-8.

Gates S et al. *BMJ* 2008;336:130-3.

Cost of Multifactorial Approach to Fall Prevention

- **Multifactorial targeted fall prevention programs are cost-effective**
 - Mean intervention cost/person: \$905
 - Mean total healthcare costs \$2,000 lower than usual care (primarily via reduced hospitalization costs)
 - Fewer overall falls and falls requiring medical attention, especially among those with four or more fall risk factors
 - Intervention cost per medical fall prevented: \$7,727-\$11,834

Rizzo JA et al. *Med Care* 1996;34:954-69.

Single Interventions to Prevent Falls

- Regular physical activity is most effective **single** intervention (reduces falls by **20%; NNT=16**)
 - May be done in a group or individually
 - Must include strength, gait, and balance
 - Should include periodic review and progression of challenge level as appropriate

Summary and Conclusions

- Falls are common, usually multifactorial in etiology, and associated with multiple adverse sequelae
- Falls are often preventable
- Multifactorial targeted fall prevention programs are cost-effective and improve quality of life of older persons
- Healthy older persons should do strength and balance exercises routinely for primary prevention of falls

Thank you for your attention!