

# Primary Care Approach for Evaluating the Risk of Falls with Elderly Patients

Danielle Hansen, DO, MS (Med Ed), MHSA  
Clinical Assistant Professor, LECOM  
Associate Director, LECOM Institute for Successful Aging  
Vice President of Acute Care Services and Quality, Millcreek Community Hospital



## Learning Objectives

- ✓ Identify the scope of the problem
- ✓ Describe the contributing factors for falls
- ✓ Address fall prevention and intervention programs



## Definition of Fall

“an event in which a person unintentionally or inadvertently comes to rest on the ground”

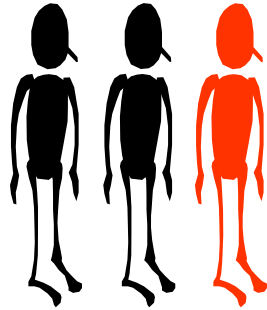


## Scope of the Problem

- High incidence
- High morbidity
- Mortality
- High service use
- Multiple causes and risk factors
- Potentially preventable



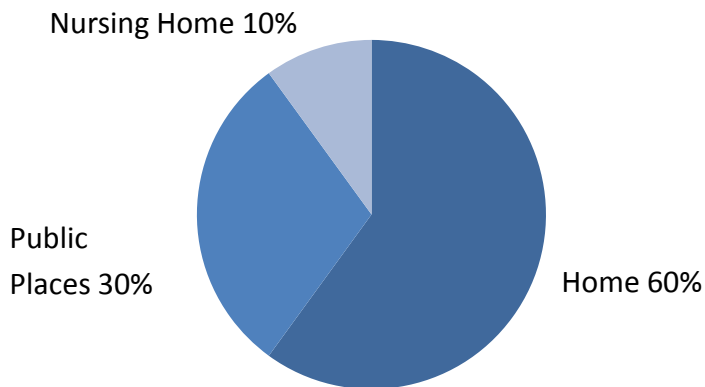
## Incidence of Falls in U.S.



1 of every 3 adults over 65 years fall in every year  
2/3 of them will fall again within the year  
2 of every 3 nursing home residents fall in every year



## Location of Falls



## Consequences of Falls

- **Mortality** - 85% of deaths due to accidents at home
  - Males > Females
- **Morbidity** - Up to 20-30% result in injury requiring care
  - **Fractures**
  - Soft tissue injuries
  - Head trauma - leading cause of traumatic brain injury in elderly
  - Joint distortions and dislocations
  - **Loss of confidence** - fear of falling
  - Restricted activity in 40-60% of fallers
- Annual fall-related injury cost is > \$20 billion



## Fear of Falling

- 30% - 50% fear falling
- Those who fall are 2-3 times more likely to fall again
- Loss of self-confidence
- Decrease of physical activity level & quality of life
- Fear of not being able to get up after a fall
  - 50% of fallers are able to get up on own
- Associated with living alone, cognitive impairment, depression, balance and mobility impairments, obesity



# Reasons Why Falls Occur

Intrinsic Factors

Extrinsic Factors



Threat to the normal homeostatic mechanisms that maintain postural stability is superimposed on underlying age-related declines in balance, gait stability, and cardiovascular function



# Reasons Why Falls Occur

Intrinsic Factors

Extrinsic Factors

Normal Aging Changes



## Intrinsic Factors

### Normal Aging Changes

- **Neurologic**
  - Proprioception ↓
  - Reaction time ↑



## Intrinsic Factors

### Normal Aging Changes

- **Neurologic**
- **Gait**
  - Slower
  - Stride length and arm swing ↓
  - Lateral sway



## Intrinsic Factors

### Normal Aging Changes

- Neurologic
- Gait
- Vision
  - Accommodation ↓
  - Dark adaptation ↓



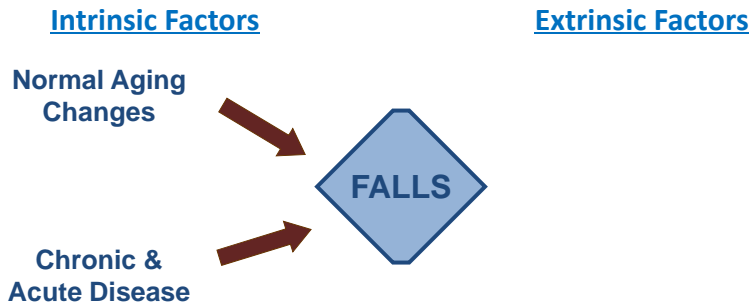
## Intrinsic Factors

### Normal Aging Changes

- Neurologic
- Gait
- Vision
- Muscle mass ↓



## Reasons Why Falls Occur



## Intrinsic Factors

### Chronic Disease

- Perceptual deficits
  - Cataracts
  - Macular degeneration
  - Hearing loss
  - Vestibular disease
  - Peripheral neuropathy
  - Cognitive impairment
- Neuromuscular
  - Stroke
  - Parkinson's Disease
  - Hydrocephalus
  - Sciatica
- Cardiovascular
  - Arrhythmia
  - Valvular disease
  - Postural hypotension
  - Post-prandial hypotension
  - Carotid Sinus Syndrome
- Orthopedic
  - Arthritis
  - Orthopedic injury
  - Spinal stenosis
- Urinary
  - Urinary incontinence





## Intrinsic Factors

### Acute Illness

- Delirium
- UTI
- Pneumonia
- Diarrhea
- Dehydration
- Vomiting



## Reasons Why Falls Occur

### Intrinsic Factors

### Extrinsic Factors

Normal Aging  
Changes

Chronic &  
Acute Disease

Trouble  
Walking



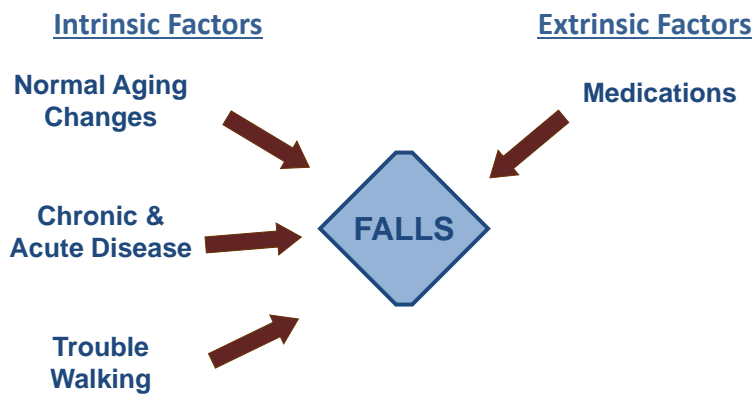
## Intrinsic Factors

### Trouble Walking

- Trouble walking increases with age
  - > 65 y/o: 15%
  - 85 y/o: 25% men; 33% women
- 2/3 of seniors in hospital/Nursing Homes can not walk w/o assistance
- Previous falls



## Reasons Why Falls Occur



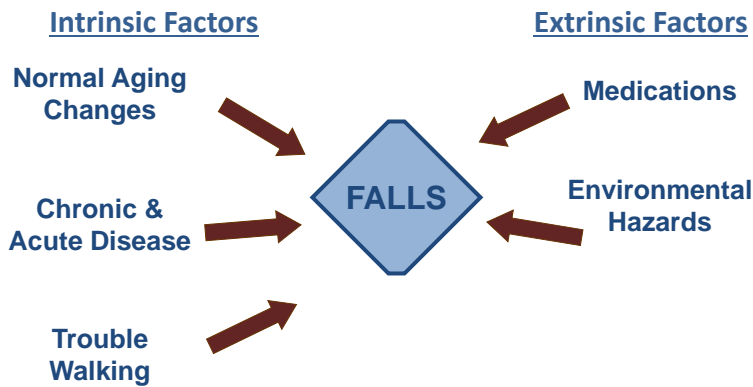
## Extrinsic Factors

### Medications

- Polypharmacy – 4+ medications
- Non-adherence to regimen
- Big offenders:
  - Sedatives → confusion, motor dysfunction
  - Neuroleptics → confusion
  - Antipsychotics → hypotension
  - Antidepressants (SSRIs = TCAs) → hypotension
  - Antihypertensives (vasodilators) → postural hypotension
  - Anti-anxiety (benzos) → confusion
  - Diuretics → urinary urgency



## Reasons Why Falls Occur



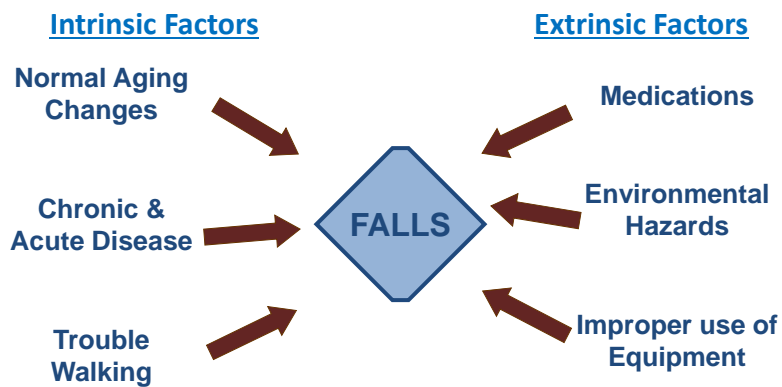
## Extrinsic Factors

### Environmental Hazards

- Clutter
- Loose rugs
- Electrical cords
- Poor lighting on stairs and hallways
- Lack of bathroom safety, e.g. grab bars in tub
- Slippery floors
- Moveable furniture
- Stairs



## Reasons Why Falls Occur



## Extrinsic Factors

### Improper use of Equipment

- Functional impairments - limited Activities of Daily Living
- Cane/Walker
- Footwear



## Causes of Falls are Multifactorial

- Falls result from the interaction of multiple physiologic changes, pathologic conditions, external hazards, and situational stresses
- Risk of falling increases with # of risk factors
  - 10-27% of community-dwelling elders with 0-1 risk factor fall
  - 68-78% of community-dwelling elders with  $\geq$  4 risk factors fall



## Assessment of Risk & Intervention

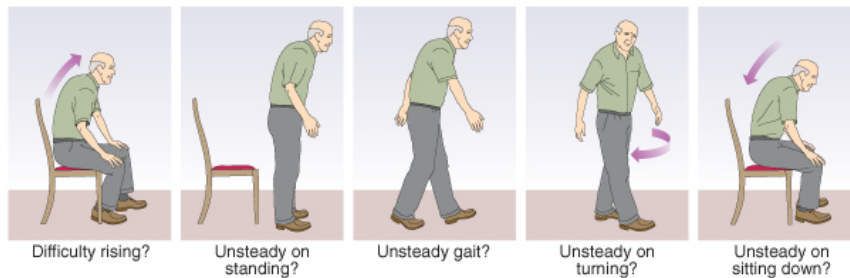
USPSTF - No single recommended tool or brief approach can reliably identify older adults at increased risk for falls. Several reasonable and feasible approaches are available for PCPs.

- “Get-up and Go” Test
  - ✓ Check for balance, gait, and mobility
- Review
  - ✓ Chronic medical conditions
  - ✓ Medications
  - ✓ Visions and hearing ability
  - ✓ Foot disabilities
- Evaluate environmental hazards
  - ✓ Home hazards



### 10 GET UP AND GO TEST

Ask the patient to stand up from a sitting position, walk 10 m, turn and go back to the chair.



© Elsevier. Boon et al.: Davidson's Principles and Practice of Medicine 20e - [www.studentconsult.com](http://www.studentconsult.com)



## “Get up and Go” Test

### Problem

- Unable to stand without pushing off
- Positive Romberg or poor balance
- Gait Disorder

### Intervention

- Quad strengthening
- Balance training: Tai Chi, Athletic shoes, correct vision, assist device
- Physical Therapy
- Neurology consultation



## Resistance Training Improves Muscle Mass and Strength

- 100 frail nursing home residents aged 72-98 (mean 87) randomized to 10 weeks of progressive quadriceps resistance training or placebo
- Results:
  - 113% increase in muscle strength
  - 12% increase in gait velocity
  - 28% increase in stair climbing power
  - 3% increase in thigh muscle area



## Medication Risk Factors

Class	Intervention
<ul style="list-style-type: none"> <li>• Antihypertensives</li> <li>• Alpha-blockers</li> <li>• Antipsychotics</li> <li>• Sedatives &amp; hypnotics</li> <li>• TCA's</li> <li>• SSRI's</li> <li>• Dopaminergics</li> <li>• Anticholinergics</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinue</li> <li>• Reduce Dose</li> <li>• Substitute</li> </ul>



## Abnormalities in BP Regulation

Physiologic Mechanism	Pathologic Consequences
<ul style="list-style-type: none"> <li>• Reduced baroreflex sensitivity</li> <li>• Decreased cerebral blood flow</li> <li>• Reduced renal salt and water conservation</li> <li>• Decreased diastolic filling</li> <li>• Vascular stiffness</li> </ul>	<ul style="list-style-type: none"> <li>• Syncope</li> <li>• Orthostatic hypotension</li> <li>• Postprandial hypotension</li> <li>• Drug-induced hypotension</li> <li>• Dehydration</li> <li>• Carotid sinus syndrome</li> </ul>





## Orthostatic Hypotension

### Problem

- Fall in BP and rise in HR

### Interventions

- Stop hypotensive meds
- Liberalize salt and fluids
- Support hose
- Exercises, avoid straining
- Fludrocortisone



## Assist Devices

- Hip pads
- Mobility aids
  - Cane
  - Walkers
  - Wheelchairs
- Bathroom aids
  - Raised toilet seats
  - Grab bars



## Vitamin D

- Men and women over age 65 years with low serum 25-hydroxyvitamin D concentrations (<10 ng/mL) are at greater risk for loss of muscle mass, strength, and hip fractures
- Evidence is not definitive for benefit on incidence of falls
  - 2014 guidelines from the American Geriatrics Society: Vitamin D3 given daily, weekly, or monthly with the dose adjusted to achieve the dosing equivalence of at least 1000 units daily
  - Guidelines from the Agency for Healthcare Research and Quality and the US Preventive Services Task Force suggest a dose of at least 800 IU daily



## Best Practices for Older Adults from Recent Clinical Studies

1. Clinical assessment & risk reduction
2. Exercise to improve balance, gait, strength, endurance, & flexibility
3. Medication management: especially benzodiazepines, antidepressants, sedatives/hypnotics
4. Multi-component programs



## Applying the Guidelines to the Individual Patient

- Treat any acute illness
- Treat specific conditions affecting balance  
i.e. Parkinson's disease, osteoarthritis, stroke
- Correct postural hypotension or arrhythmia
- Rationalize medication especially psychotropics
- Correct visual impairment where possible
- PT: balance and strength training
- OT: environmental hazard check, safety awareness
- Commence osteoporosis treatment where indicated



## Advice for Patients

- ✓ Educate patient how to use assistive devices
- ✓ Arise slowly (count to 30 when changing position)
- ✓ Maintain adequate hydration and provide small frequent meals with rest periods after meal
- ✓ Physical Exercise: 20 minutes of walking daily
- ✓ Avoid Alcohol
- ✓ Recommend Lifeline device
- ✓ Environmental safety:
  - ✓ Home assessment by home health
  - ✓ Install railings & lights
  - ✓ Secure rugs & cords
  - ✓ Fix stairs
  - ✓ Demarcate edges



## Summary

- Risk factors, best practices & effective interventions have been identified for community-dwelling older adults after many years of research
- Injury prevention is an important goal in populations at high risk for falls
- Comprehensive prevention plans/programs that include individual risk assessment & individualized multi-component/multi-faceted intervention approaches are the most effective in reducing falls & fall risks

