Identifying and Reducing risk of falls in Older Adults

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You need to know that...

- falling is **not** a normal part of aging.

- the risk of falling can be minimized.

- falling may be an early sign of illness.
Falls

• Major cause of morbidity
• Falls are leading cause of injury in adults 65 and older
  – 30-40% community-dwelling each year
  – About 50% of nursing home residents sustain a fall each year with 10 to 25% experiencing serious injuries
• Florida ranks second in the nation for seniors injured in accidental falls
Falls

• Fear of falling can adversely affect a person’s functional status and overall quality of life

• Repeated falls and consequence injuries can be an important factor when deciding to institutionalize an older adult

• Rates of falls in nursing homes and hospitals approximately 3x the rates of falls among community dwelling elderly
Complications of falls

• Injuries
  – Fracture of femur, hip, humerus, wrist, ribs
  – About 50% of people never regain previous level of function after a hip fracture

• Subdural hematoma

• Hospitalization
  – Complications of immobility, risk of iatrogenic illness

• Disability: physical or psychological

• Increased risk of institutionalization

• Increased risk of death
Complications of falls

- Findings from recent meta-analysis indicates that all cause mortality rate in older adults is increased to 5-to-8 fold three months after hip fracture and persists over time (Haentjens, Margaziner, Emeric-Coldin, Vanderschueren, et al, 2010)
Age related factors contributing to instability and fall

- Changes in postural control and blood pressure
  - Decreased proprioception
  - Slower righting reflexes
  - Decreased muscle tone
  - Increased postural sway
  - Orthostatic hypotension
  - Postprandial hypotension
Age related factors contributing to instability and fall

- Changes in gait
  - Feet not picked up high
  - Men develop flexed posture and wide-based, short stepped gait
  - Women develop narrow-based, waddling gait

- Increased prevalence of conditions causing nocturia

- Increased prevalence of dementia
Age related factors contributing to instability and fall

- Increased prevalence of pathological conditions predisposing to instability
  - DJD
  - Fractures hip and femur
  - Stroke with residual deficits
  - Muscle weakness from disease and deconditioning
  - Peripheral neuropathy
  - Diseases or deformities of feet
  - Impaired vision and/or hearing
  - Impaired cognition and judgment
  - Other diseases such as CVD and PD
Important to consider

• Important to define fall
• Ask older people about falls that did not result in injury
• Assess circumstances of near falls, mishaps or missteps as important information for prevention of future falls

Don’t ask, don’t tell!
Fall Defined

• Coming to rest on the ground, floor, or other lower level unintentionally

• Word fall interpreted in many different ways (slips, trips, mishaps, missteps)

• May not be reported as a fall
Falls

• Falls classified
  – **Extrinsic** (related to environmental factors)
  – **Intrinsic** (related to host factors)
  – **Iatrogenic** (related to treatment factors)

• Physically active older adults
  – Have a higher risk for outdoor falls
    • Most falls occurred when walking, environmental factors such as an uneven surface or curbs contributed to falls

• Adults with poor health have greater risk of indoor falls

• Bedroom and bathroom most common site of falls in the home
Causes of falls

• Accidents
  – True accidents (trips, slips, etc)
  – Interactions with environmental hazards
• Syncope: sudden loss of consciousness
• Drop attacks: sudden weaknesses without loss of consciousness
• Dizziness and/or vertigo
  – Vestibular disease
  – Central nervous system disease
Causes of falls

• Orthostatic hypotension
  – Hypovolemia or low cardiac output
  – Autonomic dysfunction
  – Impaired venous return
  – Prolonged bed rest
  – Drug-induced hypotension
  – Postprandial hypotension
Causes of falls

• Drug-related
  – Antihypertensive
  – Antidepressants
  – Antiparkinsonian
  – Diuretics
  – Sedatives
  – Antipsychotics
  – Hypoglycemics
  – Alcohol
Causes of falls

• Specific diseases
  – Acute illness
  – Cardiovascular
    • Arrhythmias
    • Valvular heart disease (aortic stenosis)
    • Carotid sinus hypersensitivity
  – Neurological causes
    • TIA
    • Stroke (acute)
    • Seizure
    • Parkinson disease
Causes of falls

• Specific diseases
  – Osteoarthritis
  – Depression
  – Neurological
    • Cerebellar disease
    • NPH
    • Central nervous system lesions (tumor, subdural hematoma)
  – Urinary (difficulty getting to toilet)
    • Overactive bladder
    • Urge incontinence
    • Nocturia
Environmental Factors to Contributing to Falls

- Unstable furniture
- Beds and toilets inappropriate height
- Unavailability of grab bars
- Uneven or poorly demarcated stairs and inadequate railing
- Throw rugs, frayed carpets, cords, wires
- Slippery floors and bathtubs
- Inadequate lighting, glare
- Cracked and uneven sidewalks
- Pets that get under foot
Other Factors Contributing to Falls

• Inability to reach personal items

• Restraints/side rails/high beds

• Improper footwear/clothing

• Lack of staff training in fall risk reduction techniques
Fall Assessment
Fall Risk Assessment

• Assessment must be an ongoing process that includes multiple types of assessment and evaluation following a fall or intervention to prevent a fall
• So do you conduct a comprehensive assessment on all older adults?
AGS guidelines

• All older persons who are under the care of a health care professional (or their caregivers) should be asked at least once a year about falls, frequency of falling, and difficulties in gait or balance

American Geriatrics Society/British Geriatric Society Clinical Practice Guidelines for prevention of falls in older adults. Available at www.americangeriatrics.org
US Preventative Services Task Force

• Community-dwelling older adults
  – Identify those at risk
  – Do not automatically perform an in-depth multifactorial risk assessment with comprehensive management of identified risks to prevent falls

• Recommend assess history of fall
• Mobility problems
• Poor performance on timed Get-Up-and Go test

Recommendations

• Ask?
  – Have you fallen in the past year?
  – How frequent and tell me about the fall?
  – Do you have difficulties with walking or balance?

• Identify modifiable and non-modifiable intrinsic and extrinsic risk factors

• Fall assessment
Non-modifiable risk factors

Intrinsic

• Female gender, older adults
• Cognitive impairment
• Chronic health conditions
  – Diabetes
  – Parkinson’s disease
  – Arthritis
  – CVA

Extrinsic

• History of falls within last 3 months
• Fear of falling
# Modifiable Risk Factors

## Intrinsic

- Unrelieved pain
- Dehydration
- Postural hypotension
- Depression/anxiety
- Sleep disturbance
- Visual problems
- Sensory impairment
- Nutritional deficit
- Urinary incontinence
- Gait imbalance
- Muscle weakness
- Functional limitations
- Dizziness

## Extrinsic

- Medications
  - Sedatives, psychotropic agents, diuretics, antidepressants, CV agents, anticoagulants, bowel preparations
- Polypharmacy (>4 medications)
- Alcohol intake
- Foot wear or foot problems
- Use of walker or assistive device
- Environmental hazards
  - Inside and outside the home
- Unfamiliarity with new environment

Sources: Fabre et al, 2010; Touhy & Jett, 2012; National Institutes on Aging, 2008; American Geriatrics Society, 2010
Components of Assessment

• Nursing assessment following a fall
• Assessment of the environment and other situational circumstances upon admission
• Assessment of the older adult’s knowledge of falls and their prevention, including willingness and ability to change behavior if necessary to prevent falls
Fall Risk Assessment Tools

• A fall risk assessment tools provide:
  – General information about a patient’s risk factors but must be used in combination
    • Physical assessment
    • Person-centered care
    • Clinical expertise
Fall Risk Assessment Tools

Morse et al Fall Scale
• [http://www.nursing.upenn.edu/centers/hcgne/gero_tips/PDF_files/Morse_Fall_Scale.htm](http://www.nursing.upenn.edu/centers/hcgne/gero_tips/PDF_files/Morse_Fall_Scale.htm)

Hendrich II Scale
• [http://www.hartfordign.org/publications/trythis/issue08.pdf](http://www.hartfordign.org/publications/trythis/issue08.pdf)

Berg Balance Scale
Timed Get Up and Go (TUG)
Timed Get up and Go test

- The person may wear their usual footwear and can use any assistive device they normally use.
  - Have the person sit in the chair with their back to the chair and their arms resting on the arm rests.
  - Ask the person to stand up from a standard chair and walk a distance of 10 ft. (3m).
  - Have the person turn around, walk back to the chair and sit down again.
  - Timing begins when the person starts to rise from the chair and ends when he or she returns to the chair and sits down.

- The person should be given 1 practice trial and then 3 actual trial. The times from the three actual trials are averaged.
Predictive Scores of TUG

• Seconds Rating
  – <10 Freely mobile
  – <20 Mostly independent
  – 20-29 Variable mobility
  – >20 Impaired mobility

Other Components of Assessment

• Medication review with possible reduction

• Focused physical exam, including postural changes in vital signs, vision and hearing screening, strength testing, gait and balance evaluation

• Review of functional and cognitive status

• Evaluation of postural pulse and blood pressure
Other Components of Assessment

- Neurological and musculoskeletal assessment
- Evaluation of foot deformities, pain, limitation in ROM
- Vision and hearing assessment
- Muscle strength
- Acute and chronic medical problems
Other Components of Assessment

- Urinary incontinence
- Assessment of mood
- Dehydration and anemia
- Evaluation of cognition
- Assessment of environment
- Infection
Postural Hypotension

- Clinically significant postural hypotension (orthostasis) is detected in up to 30% of older people
  - Decrease of 20mmHg or more in systolic pressure or decrease of 10mmHg or more in diastolic pressure
  - More common in am and should be assessed at that time

- Post-prandial hypotension
  - after a carbohydrate meal may be related to release of a vasodilatory peptide
  - more common in people with DM and PD but is present in approximately 25% of persons who fall
Assessment of Postural Hypotension

- Have the patient lie supine for 10 minutes and obtain blood pressure and heart rate.
- After the patient maintains an upright position for 3 minutes, obtain blood pressure and heart rate again.
- Defined as a drop in systolic blood pressure of 20 mm Hg or more when moving from a lying to a standing position.

Occurs in about 20% of older adults.
Assessment of Postural Hypotension

- Ask about dizziness
  - Dizziness may be more clinically important than change in pressure reading.

- May not be experiencing postural hypotension but may have short periods of dizziness and imbalance related to baroreceptor response time.

- Important for teaching about fall prevention and the importance of changing positions slowly.
Post fall assessment

• Look for physical injury and treat - remember subdural hematoma risk!
  – Fall-induced TBI deaths among people over 80 have increased significantly
• Does the person know what caused the fall?
• Are environmental obstacles present?
• Standard “incident” reports do not provide adequate post fall information
Post fall assessment

• History of fall circumstances, medications, acute or chronic medical problems that may contribute to fall

• Examination of
  – vision, gait and balance, and lower extremity joint function

• Basic neurological examination
  – mental status, muscle strength, sensory, reflexes

• Cardiovascular assessment
  – heart rate and rhythm, postural BP
Hospital Setting
– Risk factors

• Older age
• Polypharmacy (> 4 to 5 medications)
• Functional dependence
• Urinary frequency and incontinence
• Low albumin
• Severe anemia
• Emergency surgery
• History of previous falls
• Agitation
• Cognitive impairment
• Iatrogenic delirium
• Environmental hazards
Multifactorial fall risk assessment on community dwelling older adults

• Report recurrent (two or more) falls
• Report difficulties with gait or balance
• Seek medical attention or present to the ED because of a fall
Reducing fall risk
Fall Risk Reduction: Community-dwelling older people

• Medication assessment and physical examination
  – Consider physical therapists evaluation
  – Consultation with pharmacist

• Proper footwear
  – Consider podiatrist evaluation

• Modify environmental hazards
  – Occupational therapist evaluation

• Medical conditions
  – Interprofessional approach
  – Educate about interventions to reduce orthostatic hypotension & other risk factors
Fall Risk Reduction: Hospital and Nursing Home Settings

- Interprofessional approach
- Institutionally and individually
- Intrinsic, extrinsic, iatrogenic
- Standardized and individualized fall risk reduction program
- Environmental safety adaptations
  - Room, hallway and other areas
  - Personal items
Fall Prevention: Physical Therapy (PT)

- Transfer training
- Balance training
  - Standing
  - Uneven surfaces
  - Curbs and steps
- Gait training
- Assistive device training
  - Canes, crutches, walkers
- Strengthening exercises
Prevention: In the Home

• Secure or eliminate loose rugs
• Remove clutter
• Assess for adequate lighting (inside and outside, especially on stairs)
• Assess bathroom for grab bars
• Obtain referrals for OT and PT

(What can OT and PT do in the home to prevent falls?)
Fall Prevention:
Occupational Therapy (OT)

• Evaluate need for:
  – Assistive devices (especially those for bathing, toileting, eating and dressing)
  – Home modifications
Clinical Setting

• Develop systematic and standardized practice
  – Familiarize patient to environment
  – Demonstrate use of call light and keep within reach
  – Personal possessions within reach
  – Handrails
  – Bed low position, brakes locked
  – Non-slip, well-fitted footwear
  – Night light
  – Uncluttered area
  – Communicate fall risk
  – Assistance to bathroom
  – Limit use of narcotics and sedatives together
Fall Prevention: Additional Nursing Interventions

- Encourage to take classes in Tai Chi
- Monitor medications
- Monitor elimination and pain issues
- Instruct to change positions slowly
- Instruct regarding non-slip footwear
Exercise Programs

• Exercise programs that include balance training
  – Tai Chi: One study showed a 47.5% reduction in risk of multiple falls; decreased fear of falling, improved chair-rise and cardiovascular performance, reduced fall occurrences

• Gait training and advice on appropriate assistive devices
US Preventative Services Task Force Recommendations

• Exercise or physical therapy and vitamin D supplementation to prevent falls in community-dwelling adults 65 and older who are at increased risk for falls
  – Vitamin D dose
    • 600 IU for age 51 to 70 years
    • 800 IU for adults age 70 and older
Fall risk reduction programs
Reducing fall risk

• Fall prevention programs may not prevent falls
  – People reduce mobility if afraid of falling
  – Increase risk of fall

Nurses and other members of health care team may actually make it worse by limiting function of older adults
Is the fall reduction program effective?

• Track compliance

• Evaluate effectiveness
  – Determine gaps, modify processes as need and re-implement practices

• Mandate all personnel follow
  – Develop plan of action for not following

• Provide feedback
  – All stakeholders

• Monitor and evaluate performance regularly to sustain improvements achieved
Effectiveness of multicomponent fall prevention programs

• A multicomponent fall prevention program in the community targeting poor balance, vision loss, medication use, improper footwear, and postural hypotension, education about falls, physical therapy referrals, and fall assessments in people 70+ resulted in almost 10% fewer fall related hip fractures and head injuries than usual care.

• Translates into about 1800 fewer injuries, less discomfort and disability, and about $21 million less in health care costs in the region where the interventions took place (Connecticut).

(Tinetti et al, 2008)
Prevention is the Best Intervention!!!

- Educate older adults and families
- Identify those at risk before they sustain a fall
- Everyone must work together and know what the fall prevention protocols are
The 4 Commandments

• Maintenance of mobility is one of the most important components in nursing of older people
• Keep people moving any way possible for as long as possible
• Even less than an hour a week of physical exercise reduces risk of falls
• It’s never too late to start!
Resources

• American Geriatrics Society (tool kit on falls and practice guidelines for prevention of falls in older persons)
  http://www.americangeriatrics.org/education/falls.shtml

• National Center for Injury Prevention and Control (tool kit to prevent senior falls)

• Hospital Elder Life Program
  http://elderlife.med.yale.edu/public/public-main.php
Resources cont’

• Nursing Standard of Practice Protocol: Fall Prevention
  http://www.consultgerirn.org/topics/falls/want_to_know_more

• Home Safety Checklist
  www.cornellaging.org/gem/injury_falls_checklist.html
Case Study

• Mr. T is 81 year old male caregiver who fell while dropping off his wife who has dementia to the day center

• He said he tripped

What else do you want to know?
Case Study

• A clinic nurse practitioner was present and the following are his responses to her questions
  – Fell three times in past 6 months and each were related to tripping
  – Has not sustained any injury or sought medical care for falls
  – Falls occurred in his home, in fact one episode he had to call 911 for assistance off the floor
  – He is concerned about falling again

What is the next step?
Case Study

• He was referred to the fall prevention program at the Center
• An evaluation indicated:
  – Polypharmacy (8 medications)
  – Multiple medical conditions
    • Diabetes, hypertension, osteoarthritis
  – Use of assistive device for gait instability
  – TUG of 45 seconds
  – Visual impairment

What is next???????
Case Study

• Education
• Medication review and recommendations
• Referral to
  – Rehabilitative optometrist
    • Convergence insufficiency
  – Physical therapy
  – Occupational therapy
We must be advocates for fall prevention to reduce injury.

I want to be independent.
References

References