Learner Outcomes

• Operationally define a fall
• Describe the evidence-based practice process for fall risk assessment with elderly clients
• Identify intrinsic and extrinsic risk factors for falls and 5 evidence-based assessments to quantify these

Learner Outcomes

• List appropriate treatment interventions to improve balance and decrease fall risk
• Identify interdisciplinary techniques to reduce the number of falls
• Identify therapy’s role for reducing fall behavior within the interdisciplinary team
Introduction

Falls Defined

• An untoward event which results in the patient coming to rest unintentionally on the ground or other lower surface
  (Morris & Isaacs)

Falls Classification

• Accidental
  o Patient falls unintentionally

• Unanticipated physiologic
  o Cause of fall not reflected in patient’s risk factors for falls

• Anticipated physiologic
  o Patient’s score on risk assessment tool indicated he/she is at risk for falls
Scope of the Problem

- One in three adults aged 65 and older falls each year
- Of those who fall, 20% to 30% suffer moderate to severe injuries
- Older adults are hospitalized for fall-related injuries five times more often than other causes
- ER addresses 2.5 million nonfatal fall injuries annually

Centers for Disease Control, 2013 (www.cdc.gov)

Scope of the Problem

- Fall-related injuries caused > 2 million ER visits costing $7 billion (AHRQ, 2009)
- Of the 1.6 million residents in U.S. nursing facilities, approximately half fall annually, and of those, about 65,000 suffer a hip fracture (AHRQ, 2010)

Centers for Disease Control, 2013 (www.cdc.gov)

Scope of the Problem

- Typical nursing home reports 100 to 200 falls
- Between ½ and ¾ of SNF residents fall each year
- Average falls per year = 2.6
- 1,800 SNF residents die from falls each year

Centers for Disease Control, 2013 (www.cdc.gov)
Cost of Falls

• Medicare costs per fall averages between $9,113 and $13,507
• In 2000, falls among older adults cost $19 billion dollars
  - Increased to $30 billion dollars in 2010
• By 2020, annual direct and indirect costs expected to reach almost $55 billion

Causes of Falls

• Falls are not part of normal aging process
• Due to interaction of underlying physical dysfunction, cognitive deficit overlay, medications and environmental hazards
• The task of IDT to seek out, evaluate and thoroughly consider effects of many factors which contribute to falls

Common Reasons for Falls

• Muscle weakness, gait/walking problems (24% of falls)
• Environment hazards (16% – 27% of falls)
• Acute and chronic immobility
• Medications
• Other
  - Poor foot care/shoes
  - Walking aids
  - Transfer status
Balance Control

Age–Related Changes in Body Systems

• Aging accompanied by “normal” decline in nearly all body systems

• Often considered “normal” until decline causes clinically significant disability

Medications and Side Effects

• Sedatives
  o Muscle incoordination, lethargy, vertigo, confusion, depression

• Anti–anxiety medications
  o Decreased alertness, drowsiness, confusion, slowed reaction time, unsteady gait

• Psychotropic medications
  o Postural hypotension, confusion, drowsiness, tremor, gait disturbance, blurred vision, aggressive behavior
Medications and Side Effects

- Anti-depressants
  - Fatigue, tremor, confusion, ataxia, insomnia, anxiety, orthostatic hypotension
- Diuretics
  - Electrolyte imbalance, fatigue, confusion, weakness, orthostatic hypotension
- Anti-hypertensive agents
  - Weakness, orthostatic hypotension, dizziness
- Aspirin
  - Loss of sensation, amnesia, muscle relaxation, decreased reflexes

Balance Control

- Cognitive Processes
  - Safety, judgment, visual–perceptual disorders, dementia
- Musculoskeletal System
  - Strength, ROM, balance reactions, posture
- Sensorimotor System
  - Visual, vestibular, somatosensory

Age–Related Postural Changes

- Increased postural sway
- Slower distal muscle, postural and volitional muscle responses
- Decreased anticipatory responses
Movement Strategies

- Four primary movement strategies:
  - Ankle: used for small perturbations
  - Hip: used in response to larger LOB
  - Suspension: lowers COG
  - Stepping: LOB exceeds limits of stability

Prediction Tools

- Ease and speed of completion
- Small number of items
- Transparent
- Simple
- Evidence based scoring
- Good inter-rater reliability
- Valid
- Must ‘value add’
Evidence–Based Assessment Guidelines

• There is evidence that falls can be prevented by screening to detect risk factors.
  • Screening should include:
    o History and context of falls over the previous 12 months
    o At least one question about the resident's perception of difficulty with balance or walking

(Avin, et al., 2015)

Evidence–Based Assessment Guidelines

• For each resident who reports a fall, clinician should observe for gait or balance impairment
  • Positive findings when
    o resident reports multiple falls
    o resident reports one fall, and a balance or gait impairment is observed

AGS Guidelines for Fall Management (American Geriatric Society)

• Older individuals asked about falls in last year
• Asked about frequency and circumstances
• Asked about walking or balance difficulties
• Multifactorial fall risk assessment
• Single fall evaluated for gait and balance
AGS Guidelines for Fall Management (American Geriatric Society)

- Use one of the available evaluations
- If cannot complete a standardized test, use a multifactorial fall risk assessment
- Unsteadiness indicates a multifactorial fall risk assessment
- A single fall w/o difficulty or unsteadiness does not indicate a fall risk assessment
- Multifactorial fall risk assessment performed by a clinician with appropriate skills and training

Fall Risk Assessment Elements

(STEADI — cdc.gov/steadi)

- Falls History
  - Any falls in past year?
  - Worries about falling or feels unsteady?
- Medical Conditions
  - Problems with heart rate and/or rhythm
  - Cognitive impairment
  - Incontinence
  - Depression
  - Foot problems
Fall Risk Assessment Elements
(STEADI — cdc.gov/steadi)

• Medications
  o Psychoactive medications or sedating side effects

• Gait, Strength & Balance
  o Timed Up and Go (TUG) Test
  o 30-Second Chair Stand Test
  o 4-Stage Balance Test Full tandem stance

Fall Risk Assessment Elements
(STEADI — cdc.gov/steadi)

• Vision
  o Acuity <20/40 OR no eye exam in >1 year

• Postural Hypotension
  o A decrease in systolic BP ≥20 mm Hg or a diastolic bp of ≥10 mm Hg

Risk Factors for Falls

• History of falls within last 6 months is the single most predictive factor of a future fall

• Likelihood to fall increases with age
  o Age 65+, fall risk 30%
  o Age 85+, fall risk 42 – 49%
  o Age 100+, fall risk 83%
Timed Up and Go Test

- Standard chair with arms, wearing customary, and using usual walking aid
- No physical assistance is given
- Starts with back against the chair, arms resting on the arm rests, walking aid at hand
- On the word “GO,” get up and walk 3 meters away, turn, return to the chair, and sit down
- Falls prediction, 87% sensitivity & specificity

30-Second Chair Stand Test

Instructions to the patient:
1. Sit in the middle of the chair.
2. Place your hands on the opposite shoulder crossed at the wrists.
3. Keep your feet flat on the floor.
4. Keep your back straight and keep your arms against your chest.
5. On “Go,” rise to a full standing position and then sit back down again.
6. Repeat this for 30 seconds.

30-Second Chair Stand Test
Below Average Scores

<table>
<thead>
<tr>
<th>Age</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>60–64</td>
<td>&lt; 14</td>
<td>&lt; 12</td>
</tr>
<tr>
<td>65–69</td>
<td>&lt; 12</td>
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<td>85–89</td>
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<td>&lt; 8</td>
</tr>
<tr>
<td>90–94</td>
<td>&lt; 7</td>
<td>&lt; 4</td>
</tr>
</tbody>
</table>
Risk Factors for Falls

Intrinsic Risk Factors for Falls

- Advancing age, especially if older than 75
- History of a recent fall
- Specific comorbidities (e.g., dementia, hip fracture, type 2 DM, Parkinson’s, arthritis, and depression)
- Functional disability
- Cognitive impairment
- Acute and/or chronic illness
- Orthostatic Blood Pressure

Intrinsic Risk Factors for Falls

- Gait, balance, or visual impairment
- High risk medications (Chang et al., 2004)
- Urge UI (Brown et al., 2000)
- Physical restraint use (Capezuti et al., 2002)
- Bare feet or inappropriate shoe wear
- Anticoagulant use and osteoporosis (Resnick, 2013)
- Dehydration
- Peripheral Neuropathy (De Metelinge et al., 2013)
Extrinsic Risk Factors for Falls

- Floor surfaces
- Lighting
- Furniture in good repair
- Grab rails/bars
- Assistive devices improper or inadequate
- Bed rails
- Tripping hazards
- Bathtubs and toilets
- Design of furnishings
- Condition of ground surfaces
- Type and condition of footwear

Post-Fall Assessment

- Following a resident fall to identify possible causes
- Because of delayed complication of falls, observe all residents for about 48 hours after an observed or suspected fall (ECRI, 2006; GrayMiceli et al., 2006; AGS/BGS, 2011)

Screening Tools for Fall Risk

http://www.rehabmeasures.org
Screening Tools for Fall Risk

- Activities–Specific Balance Confidence (ABC) Scale
- Five Time Sit to Stand
- Single Leg Stance (SLS)
- Four Step Square test
- Fall Risk Assessment and Screening Tool (FRAST)
- Screening Assessment for Falls Evaluation (SAFE)
- Falls Risk Screening and Action Plan

Screening Tools for Fall Risk

- Morse Falls Scale
- Falls Efficacy Scale
- Hendrich II Fall Risk
- St. Thomas Risk Assessment
- Falls and Injury Risk Profile for Unsteady Older Adults
- Falls Risk for Older People (FROP)
- My Falls–Free Plan

Gait and Balance Assessments

http://www.rehabmeasures.org
Characteristics of Fallers

• Usually stop walking when talking
• Fear of falling results in shorter single leg stance and decreased stride length reducing forward momentum and allowing more time for balance recovery
• Increased step width
• Stride to stride variability

Gait Assessment

Normal Aging Gait Pattern
• Reduced stride length
• Equal step length
• Decreased gait speed

Faller’s Gait Pattern
• Reduced stride length
• Increased step width (BOS)
• Unequal step length
• Decreased gait speed

Gait Assessment

Normal BOS
Variable BOS
Gait Assessment

<table>
<thead>
<tr>
<th>TURNING 180° WHILE WALKING</th>
<th>NON-FALLERS</th>
<th>FALLERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn Time</td>
<td>≤ 2 sec</td>
<td>&gt; 4 sec</td>
</tr>
<tr>
<td>Turn Steps</td>
<td>1-3 steps</td>
<td>≥ 4 steps</td>
</tr>
<tr>
<td>Turn Performance</td>
<td>Steady, fluent, non-hesitant</td>
<td>Unsteady, NOT fluent, hesitant</td>
</tr>
<tr>
<td>Timed “Up and Go” Test</td>
<td>&lt; 11 sec</td>
<td>&gt; 11 sec</td>
</tr>
</tbody>
</table>

Dite et al. 2002; Thiepen et al. 2000

Gait and Balance Assessments

- Modified CTSIB—Clinical Test of Sensory Integration in Balance
- Berg Balance Scale
- Functional Reach
- Dynamic Gait Index (DGI)
- Tinetti POMA
- Fullerton Advanced Balance Scale
- BESTest: Balance Evaluation Systems Test
- Brunel Balance Assessment

A Review of the Evidence Related to Exercise
Evidence from the AGS/BGS (American Geriatric Society/British Geriatric Society)

• A multifactorial fall risk assessment should be followed by direct interventions tailored to the identified risk factors, coupled with an appropriate exercise program
• Interventions include:
  o Exercise
  o Environmental modification
  o Management of postural hypotension
  o Medication management
  o Management of foot problems and footwear

Evidence Related to Exercise

• Exercise program should include balance, gait, and strength training
  o Flexibility and endurance should also be offered, but not as sole components
  o Tai Chi is effective
• Exercise may be performed in groups or as a HEP
• Exercise programs should be considered to reduce falls for those in SNF

Balance Retraining
Balance Rehabilitation

• Essential to treat a balance deficit with static exercises first

• Once resident demonstrates appropriate responses to stable condition challenges, begin more dynamic activities

Balance Retraining Exercises

Improve and enhance motor coordination and movement as it relates to the ability to maintain center of gravity during static and dynamic movement

Evidence Related to Environmental Modification
Evidence Related to Environmental Modification

• Home environment assessment and intervention should be carried out by a health care professional
• Intervention should include mitigation of identified hazards in the home, and evaluation and interventions to promote the safe performance of daily activities

Home Safety Assessments

• Home hazard assessment by a
• Home modifications and recommendations
• Home exercise program
• Home walk-through using a checklist
• Participants had 61% fewer falls and 44% fewer injuries

(Campbell et al., 2005)

Home Safety Assessments

• OT to identify environmental hazards and unsafe behaviors
• Recommended home modifications and behavior change
• Used Westmead Home Safety Assessment form to ID hazards
  - For example, slippery floors, poor lighting, rugs with curled edges, loose shoes, clutter, furniture walking/reaching
• Assisted to correct hazards
• Telephone follow up for questions and encouragement
• Fall rates reduced by 33% for those with 1+ falls in prior year

(Cumming et al., 1999)
Education as Intervention

Education

• Interventions should include an education component addressing resident-specific issues and tailored to individual cognitive function and language
  o Should not be provided as a single intervention to reduce falls
  (AGS, 2011)

Example of resident Education Topics

• What causes falls?

• Why are falls dangerous?

• What increases my risk for falls?
Example of Staff Education Topics

• Ask all residents 65+ if they’ve fallen in the past year.
• Identify & address fall risk factors
• Undertake multifactorial assessment
• Refer as needed to specialists
• Apply Interventions
• Follow-up with resident

Fall Management Program

Purpose

Purpose of a Fall Management Program is to provide resident with the opportunity to achieve the highest level of safe functional mobility while reducing the possible use of restraint devices
Efficacy of a Fall Management Program

- After implementation
  - Falls decreased by 11%
  - Fall-related head injuries and hip fractures decreased by almost 10%
    - 1,800 fewer injuries
    - $21 million less in healthcare costs

Program Development

- Appointing a nurse coordinator
- Meet weekly
- Set goals
- Program implementation
- Identify and remove barriers
- Budget
- Monitoring progress and guiding data collection and analysis
  (AHRQ, 2010)

Screening and Post-Fall Assessment

- Screening upon admission and change of condition
  - Individualized care and education
- Responding immediately to a fall through careful evaluation and investigation and intervention in the first 24 hours
- Providing long term assessment through screening at admission, change of condition, quarterly, and annually
- Create a culture of safety
  (AHRQ, 2010)
Fall–Risk Assessment

• Comprehensive fall risk assessment completed by facility team
  o Upon admission
  o Transfer from another unit
  o Change of status
  o Following a fall
  o Regular intervals

Fall Assessment/History

• When did the fall occur?
• Where did the fall occur?
• Precipitating factors?
• What was the resident doing when the fall occurred?
• Why did the fall occur?
• Environmental factors?

Fall Assessment/History

• Physiological factors?
• Medical conditions?
• Positioning?
• Adaptive equipment?
• Injuries sustained?
• Functional limitations?
• Sensory aids?
• Was care plan being followed? If not, why?
**Team Roles**

- Occupational Therapy
- Physical Therapy
- Speech Language Pathology
- Nursing
- Pharmacy
- Physician
- Social Services
- Activities
- Environmental Services

**Interdisciplinary Team Members**

- Nurse Management: Key Team Member
  - Ensures fall management is a priority
  - Ensures staff comply with interventions
  - Ensures equipment is in working order
  - Ensures staff education is completed
  - Complete fall-risk assessments
  - Notify unit of high-risk admissions/transfers
  - IDT pain assessment and control
  - 24 hour report

- Audiologist
- Optometrist
- Social Services
- Activities
- Dietary

**Team Roles and Intervention Strategies**
Team Roles and Intervention Strategies

- Rehabilitation: PT/OT/SLP
  - Should emphasize functional activity
  - Assist nursing in integrating modifications and appropriate interventions to maximize resident’s safe function in facility
  - Establish Functional Maintenance and/or Restorative Programs with nursing for continuity of care to reduce risk of falls

- Specialized exercise techniques
  - Balance retraining sitting and standing and coordination
  - Gait training to improve specific aspects of gait that could increase chance of falls
  - Assess need for and implement ambulation devices
  - Pain control
  - Posture awareness

- Assess and prescribe special equipment to assist in preventing falls
  - Evaluate need for and implement use of assistive devices/adaptive equipment
  - Wheelchair prescription to meet individual needs
  - Cognitive evaluation and treatment to promote increased independence and decrease risk of falls
Team Interventions

Fall Management Interventions

- IDT interventions: General guidelines
  - Orient resident to surroundings and staff
  - Provide a physically safe environment
  - Check hearing aid(s) & Eyeglasses
  - Ensure Bowel and bladder programs are in place
  - Allow for slower reaction time
  - Allow additional time for activities
  - Properly maintain wheelchairs/assistive devices
  - Evaluate and treat pain, orthostatic hypotension, impaired vision, hearing
  - Follow the POC and strategies on FMP/RNA
    - Approach, type/amount of cues, special strategies, equipment/assistive devices

Fall Prevention

- Exercise regularly
- Medication review
- Regular eye exams
- Get up slowly
- Wear shoes
- Improve lighting
- Reduce glare
- Contrasting paint
SUCCESS!!

• Exercise and education are key to preventing falls!
• All persons in facility are aware of POC and interventions
• Follow up and document
  o Effectiveness of interventions
  o Changes to POC
  o Additional falls or risks
  o Team rounding activities

Thank You!!!

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