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Innovations in Geriatric Care
Virtual Conference
Guest Editor: Kathleen Weissberg, OTD, OTR/L

Innovations in Geriatric Care:
Evidence-based Interventions for Falls (Day 4)

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Learning Outcomes

• Understand the importance of accurate and comprehensive fall risk assessment to identify key focus areas for treatment intervention.
• Describe evidence-based treatment interventions for falls in adults over the age of 65.
• Discuss the unique role of occupational therapy in interdisciplinary fall management for older adults.

Introduction

• Fall defined: An unexpected event in which the participants come to rest on the ground, floor, or lower level (Lamb, Jørstad-Stein, Hauer, & Becker, 2005)
• Recurrent falls: More than 1 fall in a given period of time (usually 12 months) (Palmer & Watkins, 2017)
• Cause is only clear in ~15% of cases; otherwise “idiopathic” (Barban et al., 2017)
• Falls in older adults are seldom due to a single cause (Palmer & Watkins, 2017)
Introduction

- Fall injuries cost >$50 billion in 2015
- 800,000+ people per year are hospitalized due to a fall injury
- Fall injuries are among the 20 most expensive medical conditions

http://www.cdc.gov/homeandrecreationalSafety/falls/fallcost.html

A Vicious Cycle

(O’Halloran et al., 2011; WHO, 2004)
Screening

- Screen to determine if a multifactorial assessment is necessary or not
  - “Have you fallen in the previous 12 months?”
  - “Do you have difficulty with your balance or with walking?”
  - For each person who reports a fall or reports difficulty with walking/balance, observe gait and balance
- Screen is positive if the individual reports multiple falls regardless of balance/gait OR he/she reports one fall and balance/gait impairment is observed

(Avin et al., 2015)

Fall Risk Assessment

- Medication review
- Medical history
- Impairments/functional deficits – strength, balance, cognition, dizziness, vision
- Activity and participation – gait/ambulation, ADL
- Environmental factors – hazards, home safety
- Personal factors – fear, health perception

(Avin et al., 2015; Hartley & Kirk-Sanchez, 2013)
Fall Risk Assessment

- Intrinsic
  - Age
  - Previous falls
  - Muscle weakness
  - Gait/balance problems
  - Poor vision
  - Postural hypotension
  - Chronic conditions
  - Fear of falling

- Extrinsic
  - Dim lighting/glare
  - Lack of handrail/grab bars
  - Obstacles/tripping hazards
  - Slippery/uneven surfaces
  - Psychoactive meds
  - Improper use of device

Ensure the chosen assessment tool applies to your patient population
- Community-dwelling elderly
- Long-term care residents

Self-reported vs. (and?) Performance-based measures
Self-reported Assessment Tools

- Self-reported unsteadiness is independently associated with increase fear of falling, fear-related activity restriction, recurrent falls, and disability (Donoghue, Setti, O'Leary, & Kenny, 2017)

- Must consider fear of falling, balance confidence, and fear avoidance/activity curtailment when assessing (and addressing) fall risk/prevention

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Self-reported Assessment Tools

- **Falls Efficacy Scale International (FES-I):**
  Measures level of concern about falling during 16 social and physical activities inside and outside the home (Tinetti, 1990; Yardley et al., 2005)

- **Activity-specific Balance Confidence Scale (ABC):**
  Measures level of confidence with performing certain activities (Powell & Myers, 1995)
  - 67 is cut off for falls
Self-reported Assessment Tools

- **Survey of Activities and Fear of Falling in the Elderly (SAFE):** Examines 11 ADLs, IADLs and social activities and whether individual is “worried” about a fall (Lachman et al., 1998)

- **Activities-specific Fall Caution Scale (AFC):** Rate level of caution while performing or approaching a task using a “stop light” prompt (Blanchard, Myers, & Pearce, 2007)
  - Good for long-term care residents

- **Fear of Falling Avoidance Behavior Questionnaire (FFABQ):** Quantifies avoidance behavior related to the fear of falling for 14 activities (Landers, Durand, Powell, Dibble, & Young, 2011)
Performance-based Assessments

- The “Traditional” Assessments
  - Berg Balance Scale: <45 = increased risk of falls
  - Tinetti POMA: <19 = high risk of falls
  - Functional Reach: <7 inches indicates limited functional balance
  - TUG: >13.5 sec = high risk of falls (>12 sec per CDC)

https://www.sralab.org/rehabilitation-measures/database

Performance-based Assessments

- Four Step Square Test (FSST): Involves stepping over low objects and movement in 4 directions (Dite & Temple, 2002)
  - Cut point of 15 seconds identified fallers

“Step as fast as possible into each square in the following sequence: 2, 3, 4, 1, 4, 3, 2, 1.”
The purpose of a test…

- Calculate and interpret the score
- Review/analyze the test to determine where the patient’s deficits/impairments lie
- **Use the test to guide treatment**

Selecting Interventions

- Strengthening / exercise
- Balance training
- Gait training
- Correction of environmental hazards
- Cognitive / cognitive-behavioral interventions
- ADL / IADL training
- Education
- Community-based programs
Strengthening / Exercise

- Individually prescribed, monitored, and adjusted (Avin et al., 2015)
- Tai Chi
  - Reduction in fall risk and fear of falling (Mortazavi, Tabatabaeichehr, Golestani, Armat, & Yousefi, 2018)
  - Decreased number of falls, risk for falls, and fear of falling; improved functional balance and physical performance (Li et al., 2005)
- Core strength training and Pilates (Granacher, Gollhofer, Hortobágyi, Kressig, & Muehlbauer, 2013)

Balance Training

- Balance exercise: Progressive challenges while sitting, standing, and walking (Halvarsson et al., 2011)
  - Deterioration in anterior-posterior balance is associated with a high risk of fall-related serious injury (Kurz, Oddsson, & Melzer, 2013)
- Perturbation training or reactive balance training (Gerards, McCrum, Mansfield, & Meijer, 2017; Okubo, Sturrieixs, Brodie, Duran, & Lord, 2019)
  - Application of external force to body; relies on responding to instability vs. maintaining stability
Environmental Hazard Modification

- **Home safety assessment** (Stevens & Lee, 2018; LaGrow, Robertson, Campbell, Clarke, & Kerse, 2006)

- **Home modifications** (Palmer & Watkins, 2017)
  - Adjustments for low light/glare
  - Remove/tack down loose carpet
  - Ensure walkways are unobstructed
  - Ensure stair handrails are secure, contrast tape to highlight steps, nonskid strips
  - Grab bars, raised toilet seat, tub/shower chair
  - Rearranging furniture
  - Appropriate use of assistive devices/adaptive equipment

Cognitive / Cognitive-behavioral

- **Cognitive training**
  - Executive function and attention training (Barban et al., 2017)
  - Dual task training (van het Reve & de Bruin, 2014; Silsupadol et al., 2009)

- **Cognitive-behavioral training**
  - Instill realistic view of fall risk, increase self-efficacy, and change behavior (Dorrestein et al., 2016; Visschedijk, Caljouw, Bakkers, van Balen, & Achterberg, 2015)
  - Cognitive restructuring, personal goal setting, promotion of physical activities (Liu, Ng, Chung, & Ng, 2018)
Fear of Falling

- Falls-related self-efficacy (i.e., balance confidence) is the only parameter that significantly predicts therapy outcomes at discharge and at follow-up related to ADL, gait, and overall function (Denkinger, Lukas, Nikolaus, & Hauer, 2015)
- Caregiver fear of falling must be addressed also (Shen, Hu, Liu, & Tong, 2015)
- Fear of falling interventions (Zijlstra et al., 2007)

ADL / IADL Training

- Difficulty in at least one ADL or IADL doubles the risk of falling (Bloch et al., 2010)
- Significantly more limitations in ADLs and social participation for older persons with high levels of fall-related concerns (van der Meulen, Zijlstra, Ambergen, & Kempen, 2014)
Education

- STEADI – Stopping Elderly Accidents, Deaths & Injuries
  - www.cdc.gov/steadi/index.html
- Fall prevention
- Risk factors
- Fall recovery – Do not forget the floor!
  - The Critical Fall: Term applied when individual cannot stand following a fall (Bloch, 2012)
  - Timed Supine to Stand Test (Klima et al., 2016)

Community-based Programs


- Otago Exercise Program: Home-based program developed for frail older adults (Robertson, Campbell, Gardner, & Devlin, 2002)

- Stepping On: Interprofessional course for higher level clients; focuses on community safety (Clemson et al., 2004; Schlotthauer et al., 2017)
Interdisciplinary Fall Management

- “Fall Management” = Fall Prevention & Fall Risk Reduction
- Each member of the IDT has a role
  - Physician
  - Nursing
  - Pharmacy
  - PT
  - OT
  - SLP
  - Environmental Services/Maintenance

The Role of Occupational Therapy

- Home safety assessment & modification
- ADL / IADL training
- Cognitive / cognitive-behavioral intervention

AND...
- Activity adaptation and participation
- Vision assessment and intervention
- Emergency preparedness
Activity Adaptation & Participation

- Does patient restrict activities due to fear of falling or decreased balance confidence?
  - Low falls-related self-efficacy and fear of falling – correlated but distinct psychological consequences (O’Halloran et al., 2011)

- Does patient participate in activities that may increase risk of falling?

Vision Assessment & Intervention

- Acuity, visual field, depth perception, contrast and glare sensitivity

- Falls reduced by 30% when older adults instructed to have 2 pairs of glasses – one for distance, one for close (vs. bifocals) (Hartley & Kirk-Sanchez, 2013)

- Contrast sensitivity was a significant predictor of fall occurrence (Boon et al., 2015)
Emergency Preparedness

- What happens after a fall?
  - Cell phone
  - Phone apps – direct contact to emergency assist
  - Emergency alert devices
  - State-specific senior call check program
  - Self-assessment
  - Floor transfer


BOTTOM LINE…

- Multi-factor treatment is key!
  - Multifactorial interventions provided by a multidisciplinary team reduced rate of falls in institutionalized elderly (Cameron et al., 2010)

  - Address cognitive impairments, strength, balance, polypharmacy, depression, environmental hazards (Florence et al., 2018; Avin et al., 2015)
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References:


References (continued):

References:


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- [www.cdc.gov/steadi/index.html](http://www.cdc.gov/steadi/index.html)
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