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Fall Management

Evidence-Based Intervention for Balance and Falls Prevention

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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

CONTINUED™

Let's Review …

- Anticipated physiologic (78%)
  - Patient's score on risk assessment tool indicated he/she is at risk for falls
- Balance Control
  - Cognitive Processes
  - Musculoskeletal System
  - Sensorimotor System

Evidence from the AGS/BGS

- 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:
  - Exercise
  - Environmental modification
  - Management of postural hypotension
  - Medication management
  - Management of foot problems and footwear

Evidence Related to Exercise

- Exercise program should include balance, gait, and strength training
  - Flexibility and endurance should also be offered, but not as sole components
  - 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

Inconclusive Evidence That …

- Exercise programs should take into account the physical capabilities of the person
- Be prescribed by qualified health professionals
- Should be reviewed, adjusted, or progressed regulalry

Exercise Classes

- Address balance, coordination, strength, reaction time, aerobic capacity
  - Warm up and cool down including gentle stretching and controlled breathing
  - Balance and coordination exercises including stepping and direction changes, dance steps, throwing and catching
  - Strengthening exercises including UE/LE resistance-band exercises
  - Aerobic exercises including fast-walking, changes in pace/direction
- Individuals are 40% less likely to fall and 33% less likely to suffer a fall-related injury (Barnett et al., 2003)

Group and HEP

- Group exercises classes, HEP, recommendations to increase activity levels
  - Strength and flexibility training
  - Balance and motor coordination training
  - Endurance training
- Group discussions to outline goals and progress
- Participants experienced 23% fewer falls

(Freiberger et al., 2007)

Tai Chi

- Each hour-long session included:
  - A 5- to 10-minute warm-up period
  - Practice of Tai Chi movements
  - A 5- to 10-minute cool-down period
- Practicing at home was encouraged and monitored using a home-practice log.
- Class size of 15 is ideal
- Attend classes at least 2 X per week
- Fall risk reduced 55%

(Li et al., 2005)

Balance Rehabilitation

- Essential to treat a balance deficit with static exercises first
- Once patient 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

Balance Retraining Exercises

- Stand on one leg for 30 seconds; switch feet and repeat
- Stand with feet hip width apart with eyes closed for 30 seconds; move feet closer and repeat
- Stand heel-to-toe with eyes closed for 30 seconds; switch feet and repeat
- Walk heel-to-toe forward, then backward
- Balloon toss: increase amount of movement off midline required to hit the balloon

Balance Retraining Exercises

- Ball toss/kick: vary size and weight of the ball, increase amount of movement off midline required to toss/kick the ball
- Stand on tilt board with feet hip width apart; practice keeping the board still then voluntarily moving it forward/backward
  - Move feet closer together or introduce perturbations to person or tilt board to increase difficulty
  - Turn the board around and practice side-to-side direction
  - Add balloon or ball toss to increase difficulty

Balance Retraining Exercises

- Squat to pick up objects off the floor; vary the size and weight of the objects
  - May start by placing objects on a step stool or mat and progress to the floor
- Stand on foam, feet hip width apart, eyes open for 30 seconds; close eyes and repeat
  - Bring feet closer together to make more difficult
- Step-ups; vary height of step and direction of stepping (forward, sideways, diagonal)
- Lunges forward, sideways and in diagonal direction

Balance Retraining Exercises

- Stand on one leg with the other foot placed on a ball
  - Practice keeping the ball still
  - Move ball slowly forward/backward in a straight line
  - Move ball side to side and in circles
- Walk forward 10 ft and stop quickly; repeat
- Walk forward 10 ft, quickly pivot turn and walk back; repeat, turning the other direction
- Walk backwards 5 ft and stop quickly; repeat

Balance Retraining Exercises

- Walk forward varying the speed (e.g., very slow ... fast ... very slow)
- Walk forward stepping over objects on the floor; repeat
- Walk in a straight line and rotate head from side to side; repeat
- Walk in a straight line while and tilt head up and down; repeat
- Walk in cluttered environment
- Walk in distracting environment (e.g., noise, people, traffic)

Balance Retraining Exercises

- Walk on different surfaces (e.g., carpet, grass, gravel, sand)
- Walk carrying various objects (e.g., glass with water, food tray)
- Walk in/out doors (vary type and weight of doors)
- Walk in/out of elevator (emphasis on time constraint to enter/exit)
- Practice getting on/off escalator

Postural Control Exercises

- Provide practice to improve balance in walking ability
- Listed in approximate order of difficulty
- Practice the 2 or 3 most difficult tasks
- Try to maintain each exercise for 30 sec
- Best to perform exercises without shoes (particularly high heels) and not on thick-pile carpets

Postural Control Exercises

1. Stand with both feet together and eyes open
2. Stand with both feet together and eyes closed
3. Stand with one foot ahead of the other touching heel-to-toe with eyes open
4. Stand with one foot ahead of the other touching heel-to-toe with eyes closed
5. Walk with eyes open using a steady, narrow gait

Postural Control Exercises

6. Walk with eyes closed using a steady, narrow gait
7. Walk with the heel of one foot touching the toe of the other with each step; keep the feet straight and walk slowly with eyes open
8. Walk with the heel of one foot touching the toe of the other with each step; keep the feet straight and walk slowly with eyes closed

Postural Control Exercises

9. Walk slowly with eyes open moving head back and forth as far to the right and left as possible; move the head quickly
10. Walk slowly with eyes closed moving the head back and forth as far to the right and left as possible; move the head quickly
11. Stand on one foot at a time; while standing, move the other foot forward and backward in the air as far as possible
12. Finally, repeat with eyes closed

Treatment Ideas for the Tinetti

- Sitting balance
  - Trunk resistive exercises
  - Spine symmetry training
- Standing balance
  - Tandem and semi-tandem stands
  - LE PRE
  - Balance board

Treatment Ideas for the Tinetti

- Sit to/from stand
  - LE joint mobilization
  - Body mechanics
  - LE ther ex (eccentric training)
  - Coordination
  - Low back pain
  - Postural symmetry

Treatment Ideas for the Berg

1. Sit to stand
   - Chairs with different heights
   - Chair push ups; mini-squats
   - Forward reaching
2. Standing unsupported
   - Resisted side step
   - Tandem and semi-tandem standing
   - Lateral swaying
   - Narrow base – trunk turns and reaching

Treatment Ideas for the Berg

3. Sitting unsupported
   - Pelvic tilt
   - Reaching forward
   - PNF diagonals
   - Toes only on the ground
4. Standing to sitting
   - Mini-squats
   - Wall slides
   - Forward hip thrusts
   - Differing heights

Treatment Ideas for the Berg

5. Transfers
   - Turns, marching, one-leg stance
   - Side steps
6. Standing with eyes closed
   - Head turns, ankle rocks
   - Sit to stand, lateral sways
7. Standing with feet together
   - Side stepping/reaching
   - Balance board, hip abduction

Treatment Ideas for the Berg

8. Forward reach
   - Trunk extension/shoulder flexion
   - Ankle sways
   - Wobble board
9. Retrieving object from floor
   - Deep squats, weighted mini-squats
   - Knee flexion, hip flexion
   - Wall slides

Treatment Ideas for the Berg

10. Turning to look behind
    - Trunk rotation, axial mobility work
    - Tai Chi
11. Turning 360 degrees
    - Head turns
    - Progressive head/trunk turns sitting to standing
12. Placing alternate feet on stool
    - Marching, long arc quads
    - One-leg stance, hip abduction

Treatment Ideas for the Berg

13. Tandem standing
    - Side stepping
    - Narrow base progression
    - One-leg stance
14. One-legged standing
    - Narrow base progression
    - Leg swing
    - One-leg stance

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

Evidence Related to Environmental Modification

- Home assessment, education in risk areas, and referral to the doctor reduces falls
  - Home assessment without referral does not reduce falls
  - For fall-related ER patients, assessment of medical and occupational therapy and referral and follow up reduces falls

(Feder et al., 2000)

Home Safety Assessments

- Home hazard assessment by a therapist
- 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)

Home Safety Checklist

Floors

- A lot of furniture?
- Throw rugs?
- Clutter on the floor?
- Wires or cords?

Kitchen

- Often used objects on high shelves?
- Step stool unsteady?

Home Safety Checklist

Stairs and Steps

- Clutter/objects on the stairs?
- Steps broken or uneven?
- Missing a light over the stairway?
- Only one light switch for your stairs?
- Stairway light bulb burned out?
- Carpet on the steps loose or torn?
- Handrails loose? Only on one side?

Home Safety Checklist

Bathroom

- Tub/shower floor slippery?
- Need support for tub/toilet transfers?

Bedroom

- Light near the bed hard to reach?
- Path to the bathroom dark?

Orthostatic Hypotension

- Sleep in a bed with the head raised to minimize sudden drop in blood pressure
- Elastic stockings to minimize venous pooling
- Rising slowly or sitting on the side of the bed for several minutes before standing
- Avoid heavy meals and vigorous activity in hot weather

(Rubenstein, 2006)

Medication Management

- Psychoactive medications should be minimized or withdrawn
  - Sedative hypnotics
  - Anxiolytics
  - Antidepressants
  - Antipsychotics
- All medications should be reviewed, and minimized or withdrawn
- Vitamin D supplements of at least 800 IU per day should be considered

(AGS, 2011)

Footwear

- Identification of foot problems and appropriate treatment should be included
- Shoes of low heel height and high surface contact area may reduce fall risk

(AGS, 2011)

Yaktrax®

- Lightweight traction device that fits over shoe to prevent falls on ice/snow
- Must be able to safely put on and take off the Yaktrax Walker or leave on dedicated pair of shoes
- Do not use indoors
- Inspect for breakage or damage
- In winter months, participants were 50% less likely to slip and 60% less likely to fall
- Fewer fall-related injuries

(McKiernan, 2005)

Evidence for Other Interventions

- In older women, cataract surgery should be expedited to reduce fall risk
- Do not wear multifocal lenses while walking, particularly on stairs

(AGS, 2011)

Insufficient Evidence That …

- Vision assessment and intervention should be included in a as a single intervention or within a multifactorial fall prevention program

(AGS, 2011)

Multi-faceted Programs

- Programs that combine interventions reduce falls
  - Postural hypotension
  - Number of drugs
  - Balance, transfers, gait
  - Post-fall assessment with individual treatment plans
  - Patient and staff education
  - Use of hip protectors

(Feder et al., 2000)

Multi-faceted Intervention

- Address multiple fall-related risk factors
  - Risk appraisal; introducing balance and strength exercises
  - How to move safely in the home
  - Home hazards
  - Community mobility and safe footwear
  - Vision, hip protectors, diet
  - Medication management;
  - Follow-up home visit and booster sessions
- Fall rate reduced 30%; falls for men reduced by 66%

(Clemson et al., 2004)

Education

- Interventions should include an education component addressing patient-specific issues and tailored to individual cognitive function and language
  - Should not be provided as a single intervention to reduce falls

(AGS, 2011)

Education

- Combined with other interventions
- Individual (e.g., hearing/vision impaired) or group
- Use visual aids (e.g., brochures, fact sheets, checklists)
- Informal group discussions
- Delivered by trained professionals on an ongoing basis

Patient Education

- What causes falls?
- Why are falls dangerous?
- What increases my risk for falls?
- How can I prevent falls?

Patient Education: Fall Prevention

- Make an appointment with the doctor
  - What medications are you taking?
  - Have you fallen before?
  - Could your health conditions cause a fall?
- Exercise regularly
- Wear sensible shoes

Patient Education: Fall Prevention

- Remove home hazards
  - Remove clutter from walkways
  - Move furniture from high-traffic areas
  - Secure loose rugs
  - Repair loose floorboards and carpeting
  - Store items within easy reach
  - Immediately clean spills

Patient Education: Fall Prevention

- Light up your living space
  - Night lights, lamps, clear paths to light switches
  - Flashlights for power outages
  - Lighting in stairwells
- Avoid alcoholic beverages

Patient Education: Fall Prevention

- Use assistive devices
  - Cane/walker
  - Hand rails in stairways
  - Nonslip treads for bare-wood steps
  - Raised toilet seats
  - Grab bars
  - Shower seat/bench
  - Hand-held shower
  - Non-skid strips in shower/tub

Staff Education

- Ask all patients 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 patient

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

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
  - Upon admission
  - Transfer from another unit
  - Change of status
  - Following a fall
  - Regular intervals

Indicator	Score
History of falling; immediate or within 3 months	No = 0 Yes = 25
Secondary diagnosis	No = 0 Yes = 15
Ambulatory aid	None, bed rest, wheelchair, nurse = 0 Crutches, cane, walker = 15 Furniture = 30
IV/Heparin Lock	No = 0 Yes = 20
Gait/Transferring	Normal, bed rest, immobile = 0 Weak = 10 Impaired = 20
Mental status	Oriented to own ability = 0 Forgets limitations = 15

Morse Fall Scale

Risk Level	MFS Score	Action
No risk	0-24	None
Low risk	25-50	Standard Fall Prevention Interventions
High Risk	= 51	High Risk Fall Prevention Interventions

Standard Interventions: e.g., transfer toward stronger side, lock moveable equipment, adequate lighting, place care items within reach

High Risk Interventions: e.g., bed/chair alarm, non-skid floor mat, modify environment

Falls Efficacy Scale

Take a bath or shower	Answer the door or telephone
Reach into cabinets or closets	Get in and out of a chair
Walk around the house	Getting dressed and undressed
Prepare meals not requiring carrying heavy or hot objects	Personal grooming (i.e., washing your face)
Get in and out of bed	Getting on and off the toilet

1 = very confident
10 = not confident at all
Score greater than 70 indicates fear of falling

How confident are you that you will not lose your balance or become unsteady when you …	
Walk around the house	Sweep the floor
Walk up or down stairs	Get into or out of a car
Bend over and pick up a slipper from the front of a closet floor	Walk outside the house to a car parked in the driveway
Reach for a small can off a shelf at eye level	Walk across the parking lot to a mall
Stand on your tiptoes and reach for something above your head	Walk in a crowded mall where people rapidly walk past you
Stand on a chair and reach for something	Are bumped into by people as you walk through the mall
Walk up or down a ramp	Walk outside on icy sidewalks
Step onto or off an escalator while you are holding onto a railing	Step onto or off an escalator while holding onto parcels such that you cannot hold onto the railing

Scoring the ABC Scale

- 0% = no confidence; 100% = confident
- Total the ratings; divide by 16
- If different confidences (e.g., up vs. down), use the lowest confidence

80% = high functional level
50-80% = moderate functional level
<50% = low functional level
<67% = risk for falling

Fall Risk Assessment Missouri Alliance for Home Care

- Age
- Diagnosis (3 or more)
- History of falls
- Incontinence
- Visual impairment
- Impaired functional mobility
- Environmental hazards
- Poly-pharmacy
- Pain affecting function
- Cognitive impairment

Presence of 4 or more is considered at risk for falls

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Hendrich II Fall Risk

- Confusion/dis-orientation/impulsivity
- Symptomatic depression
- Altered elimination
- Dizziness/vertigo
- Male gender
- Any administered antiepileptics
- Any administered benzodiazepines
- Get Up and Go Test
  - Rises, no LOB
  - Pushes up, successful
  - Unable to rise

Score of 5 or more indicates high risk for falls

St. Thomas Risk Assessment

- Fall as a presenting complaint
- Agitation
- Frequent toileting
- Visual impairment
- Transfer/mobility score of 3 or 4+

1 = presence; 0 = absence

Score $\geq$ 2 = high risk for falls

Any falls in the last six months?
4+ prescription or OTC medications?
Any difficulty walking or standing?
Use a cane, crutches or walker? Or hold onto things when walking?
Use your arms to stand up from a chair?
Unsteady on your feet, weak or dizzy?
More than 2 years since an eye exam?
Hearing gotten worse with age? Or people say you have a hearing problem?
Exercise less than 2 days a week (30 minutes each day)?
Any alcohol daily?
More than 3 chronic health conditions? (e.g., diabetes, HTN, arthritis)

Post-Fall Huddle

- Report all falls
- ASAP:
  - When a fall occurs
  - Near where the fall occurred
- Determine contributing factors to the fall
- Intervene as needed

(Quigley et al., 2009)

Fall Assessment/History

- When did the fall occur?
- Where did the fall occur?
- Precipitating factors?
- What as the resident doing when 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?

Comprehensive Approach

- OT
- PT
- SLP
- Nursing
- Pharmacy
- Physician
- Social Services
- Activities
- Environmental Services

Team Roles and Intervention Strategies

- Physician and Nursing
  - Stabilize medical conditions/medication responses
  - Initiate treatments/other POC
  - Safety education with resident/caregiver
  - Take Pharmacist recommendations
  - Ensure screening for osteoporosis
  - Refer patients to Pharmacist for medication review

Team Roles and Intervention Strategies

- 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

Team Roles and Intervention Strategies

- Restorative/Nursing Assistants
  - Implement concept of independence
  - Safety education with resident
  - Encourage movement throughout waking hours
  - Develop mobility programs
  - Ensure compliance with interventions (e.g., frequent checks of residents, use of devices)
  - Modify rooms of high-risk patients if needed
  - *Prompt response to resident's needs*

Team Roles and Intervention Strategies

- Pharmacist
  - Review medications for those contributing to falls
  - Notify MD about drug interactions/side effects
- Audiologist/Optometrist
  - Annual assessment for hearing and vision to reduce risk of falls

Team Roles and Intervention Strategies

- Social Services and Nursing
  - Establish behavioral modifications
  - Provide psych services as needed
- Activities:
  - Encourage participation in regular activities
  - Provide socially stimulating environment
  - Include combination of activities that encourage both cognitive activities and physical movement

Team Roles and Intervention Strategies

- Dietary:
  - Recommend and establish appropriate nutritional interventions and hydration schedule with nursing
  - Monitor intake and weight gain/loss
  - SLP intervention to establish appropriate diet and compensatory strategies
  - OT for appropriate interventions for dining

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

Team Roles and Intervention Strategies

- Specialized exercise techniques (PNF, Bobath, sensory integration 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

Team Roles and Intervention Strategies

- 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

Fall Management Interventions

- Orient patient to surroundings and staff
- Lighting adequate for safe mobility/activity
- Non-slip, well-fitting footwear
- Instruct to call for help before getting out of bed
- Demonstrate use of call bell
- Call bell in reach and visible

Fall Management Interventions

- Provide physically safe environment
- Personal care items within reach
- Assistive devices within reach
- Bed in low position with wheels locked
- Ambulate early and frequently
- Identify resident with colored wrist band or other identifier
- Minimize distractions

Fall Management Interventions

- Bowel and bladder programs for urgency and incontinence
- Transfer to stronger side
- Use grab bars
- Lock moving equipment
- Evaluate and treat pain, orthostatic hypotension, impaired vision, hearing

Fall Management Interventions

- IDT interventions: General guidelines
  - Check hearing aid(s)
  - Eyeglasses clean and worn
  - Allow for slower reaction time
  - Allow additional time for activities
  - Properly maintain wheelchairs/assistive devices
  - 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
  - Effectiveness of interventions
  - Changes to POC
  - Additional falls or risks
  - Team rounding activities

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