Falls in Cardiopulmonary Patients

Kentucky Cardiopulmonary Rehabilitation Association
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Objectives

1. Describe the American Geriatric Society Clinical Practice Guidelines on Prevention of Falls in Older Persons.

2. List risk factors and common impairments in older persons with cardiovascular and pulmonary disease that place them at risk of falls.

3. Describe the screening process used to identify fall risk in older adults.


5. Recognize when it is appropriate to make a referral to another healthcare provider in patients with risk of falling.

6. Describe evidence based practices to address fall prevention.
Prevalence & Incidence

• 37% of older community dwellers fall each year
• Greatly increased risk with advancing age
• 6th leading cause of death in 75 yrs and older
• Major source of disability through broken bones, activity restriction, fear
• Major problem facing America and getting worse
Fall Statistics

- Those who fall are 2-3 times more likely to fall again
- 10-20% of falls cause serious injuries
- 20-30% fear falling
- 20% die within a year after a hip fracture
- 25% of patients with hip fractures are still in a nursing home one year later

*from NCOA.org. Beattie*
Clinical Practice Guidelines for Prevention of Falls (2010)

- American Geriatrics Society/British Geriatric Society
- Community-dwelling older adults (≥ 65 years)
- Who should be screened for falls & how often?
- Step 1 > Screen for falls or fall risk
- Step 2 > Determine need for further assessment
- Step 3 > Refer for multi-factorial fall assessment, refer for treatment, or reassess periodically
Clinical Algorithm (AGS/BCS)

- ≥ 2 falls in last 12 months?
- Presents with acute fall?
- Difficulty with walking and balance?

YES to ANY Q

Refer for Complete Multi-factorial Fall Risk Assessment
Clinical Algorithm (AGS/BCS)

• Initiate Appropriate Interventions (per AGS/BCS guidelines)
Clinical Algorithm (AGS/BCS)

- >2 falls in last 12 months?
- Presents with acute fall (sought medical attention)
- Difficulty with walking and balance?
  - NO to ALL Q

No Fall in Past 12 months  Reassess periodically
Clinical Algorithm
(AGS/BCS)

Single Fall in Past 12 Months?
↓
YES
Abnormal Gait or Balance?
↓
↓
YES
NO
Complete multi-factorial
Fall risk Assessment
Reassess Periodically
Summary of AGS/BGS rec

• Need multi-factorial fall risk assessment if:
  – Reports 2 or more falls in past year
  – Reports difficulties with walking and balance
  – Sought medical attention because of a fall.

» OR
Summary of AGS/BCS rec

- If person reports only one fall, evaluate for deficits in gait or balance.
- If they report difficulty or unsteadiness during evaluation, request multi-factorial fall assessment.
- If no problems with gait or balance, do not require multi-factorial fall assessment, but reassess periodically.
Fall Risk Factors

INTRINSIC:
¬ Vision, hearing
¬ Strength *
¬ Balance
¬ Medications (4+)
¬ Mental status
¬ Poor Posture
¬ Joint Pain, OA
¬ Orthostatic Hypoten.

EXTRINSIC:
¬ Poor Nutrition
¬ Footwear
¬ Clutter
¬ Wet surfaces
¬ Loose rugs/carpets
¬ Electrical Cords
¬ Poor lighting
¬ Hurrying/rushing
What does the over-65 patient look like?

- One or more chronic diseases with multiple co-morbidities. *(Agency on Aging)*
  - > 80% > 65 years have 1 or more chronic disease,
  - 50% have 2 or more, 25% have 4 or more.
  - One chronic disease increases risk of falling 32.2% *(Lawlor et al, BMJ, 2003)*
- Most common co-morbidity in older adults is osteoarthritis (over 60 %)
- 52% of older adults have limitations in ADL *(Federal Council on Aging)*
- Gait speed, balance and muscle strength starts to decrease in 60’s
What types of patients come to Cardiopulmonary Rehab?

- Recently hospitalized and loss of functional mobility
  - Illness or injuries leading to hospitalization or restricted activity increase the risk of disability (need help with ADLs) *(Gill et al, JAMA 2004)*
  - As few as 2 days in bed can lead to loss of functional mobility
- Sedentary lifestyle and deconditioned
  - 30.1% of KY adults have no leisure activity *(CDC, 2010)*
- Earlier discharge from hospital
What types of patients come to Phase II Cardiac Rehab?

• Possibly recent major surgery (CABG)
  – Subjects ability to perform basic ADLs return to pre-op levels by 2 months post-op (LaPier, JCR, 2007)
Balance Deficits & Fall Risks

• Cardiovascular Disease
  – Diuretics (thiazides) are associated with increased risk of falls (especially first 3 weeks) (Gribbin et al, 2010)

• CV causes of falls
  – 1) Neurally mediated (orthostatic hypotension, vasovagal syncope)
  – 2) Cardiac rhythm or structure abnormalities (valve dysfunction, etc)
  – 3) Miscellaneous (TIA, PE)
    – (Carey and Potter, Age and Ageing, 2001)
Phase II Cardiac Rehab Patients

• Phase II Mayo Clinic, Pittsburg (Goel et al, JCR, 2010)
  – N = 284, Mean Age = 62.1 years
  – 25% reported Musculoskeletal Pain
    Back (29%) Knee (17%) Hip (8%)
  – Balance abnormality (present in 58%)
    • Tested by Single Leg Stance and tandem gait
  – 11% reported previous fall or gait instability
Balance Deficits & Fall Risks

• Pulmonary Disease
  – Skeletal muscle dysfunction (weakness and disuse atrophy) common comorbidity in COPD and ILD (Robles et al, JCR, 2011)
  – Anxiety and/or antidepressant meds increase risk of falling 50% (Lawlor et al, BMJ, 2003)
  – Reduced balance and mobility in COPD patients
  – Increased postural sway (medial-lateral direction) (Chang et al, JCR, 2008)
Cardiac Patients

- Patients may need individualized rehab services *before* Out-patient Cardiac Rehab to address impairments that could interfere with their ability to participate in exercise; chronic pain, impaired balance, functional limitations *(LaPier)*
Fallers in Patients with Pulmonary Disease

- Tended to be older
- Female
- Oxygen dependent
- Hx of previous falls
- More Co-morbidities
- More Medications

- Most important predictors of falls in this population > previous falls and diagnosis of CHD. Pts with COPD have high incidence of falls

- (Roig et al, Respiratory Medicine, 2010)

Fall prevention programs in COPD are recommended.
Many balance, gait and mobility assessments

- One single test does not effectively screen for fall risk
- Tool selection depends on patient’s status
- Positive screening test identifies individuals who may benefit from multi-factorial fall assessment
Gait & Balance Tests

- Timed Up and Go (TUG)
- Berg Balance Scale
- Performance Oriented Mobility Assessment (Tinnetti)
- Single Leg Stance (SLS)
- Five Times Sit to Stand
- Gait Velocity
- Dynamic Gait Index
TUG

- Test for agility, balance and lower extremity strength
- Predicts fall risk and functional independence
- Get up from standard height chair with arms, walk 10 ft, turn around and return to chair.
- Cut off score is 13.5 seconds
- Slower time associated with falls and dependence.
Single Leg Stance

- Stand with arms folded across chest
- Balance on one leg, without raised leg touching the other leg
- Maintain for 20 seconds (normal for older adult)
- Less than 5 seconds = high fall risk
- 5-19 seconds = moderate fall risk
5 Times Sit to Stand

- Test to measure balance, leg strength, leg power, coordination
- Use standard height chair without arm rests
- Instructions: Stand up from a chair 5 times as quickly as possible without using your arms.
- Start timing with starter’s signal, 1,2,3 Go
5 Times Sit to Stand

• If patient cannot stand from chair without use of arms 1-5 times = risk for falls
• Average time for 60 yr and over to complete 5 times = 12 seconds
• More than 12 seconds more likely to be multiple faller (Tiedemann et al, Age Ageing, 2008)
Gait Speed

• Normal gait speed = 1.2 m/sec (2.7 mph)
• Slow gait speed associate with high fall risk, morbidity and mortality (JAMA, 2011)
• Sixth Vital Sign (Fritz and Lusardi, J Geriatr Phys Ther, 2009)
Multi-factorial Fall Risk Assessment

**Focused History**

1. Relevant Medical History
2. Physical Exam
3. Cognitive Assessment
4. Functional Assessment (ADLs, Fear of Falling)
5. Medication review

**Determine Fall Risk**

- History of Falls
- Gait, balance, and mobility
- Visual acuity
- Neurological function
- Muscle strength (LE)
- Heart rate and rhythm
- Postural hypotension
- Feet and footwear
- Environmental hazards assessment
Multi-factorial Intervention to address identified fall risk(s)

1. Minimize medications
2. Provide individualized tailored exercise program
3. Treat vision impairment (including cataract)
4. Manage postural hypotension
5. Manage HR and rhythm abnormalities
6. Supplement Vitamin D
7. Manage foot and footwear
8. Modify home environment to improve safety
9. Provide education and information
Evidence-based Exercise Program

- Exercise programs should take into account the physical capabilities and health profile of the client (customized) and prescribed by qualified health professionals.
- Program should be reviewed regularly, progressed and modified as appropriate.
- Exercise program such as Tai Chi or Physical Therapy recommended as an effective intervention to prevent falls.
- *(AGS/BGS)*
Evidence-based Exercise Interventions

- Strengthening exercise
- Balance training
- Resolve or minimize gait deficits
  - Endurance and Flexibility recommended as a supplement
- Exercise should be included as component of multi-factorial interventions in community-dwelling older adults
Fall Prevention Tips in CP patients

• Safety getting on/off treadmill
• Use the treadmill rail and bike handlebars to stabilize
• Get up slowly from bike or floor
• Verbal signals when passing if on an indoor track
• Bright tape flags on long oxygen cords (at home)
CDC: STEADI Tool

- Stopping Elderly Accidents, Deaths, Injuries (STEADI)
- To be released this spring, 2012 by www.CDC.gov
- To follow the AGS/BGS guidelines
Multi-factorial Nature of Falls Demands a Coordinated Effort

• For any of these evidence-based interventions to be effective, they must be included as part of a program that addresses multiple risk factors for falls as most falls can be attributed to multiple causes ..... and is tailored to meet individual needs.

• www.NCOA.org.Beattie
Thank You!
References


References


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References


References


http://www.aoa.gov/AoARoot/Press_Room/Products_Materials/pdf/fs_EvidenceBased.pdf