Balance and Falls in the Elderly

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Healthcare Costs

- 3 Trillion for Healthcare in 2015
- Medicare - 20% of all Healthcare costs
- Cancer 36.8 Billion
- Falls 31.3 Billion
What is a Fall?

• An event which results in a person coming to rest inadvertently on the ground, floor or other lower level surface (WHO)
Fall Statistics

• Fall related deaths in those >65 have steadily increased from 2005 to 2011.
• 2012 - 25,000 fatal falls cost 616.5 million
• 3.2 million non-fatal falls cost 30.3 billion
  – Women fall more > men
  – Avg. cost of fall $9400.00
  – 85 and older - 1/3 of 30.3 billion
Who Falls?

- 30% of community dwellers >65
- 50%+ of nursing home patients
- 75% of slips/trips/falls unreported
- 25-89% of hospital adverse events
- 10-20% of fallers fall repeatedly
Risk Factors

INTRINSIC
• Increasing age
• Previous fall in past 6 months
• Neurologic/Cardiovascular Dz.
• Osteoporosis/Osteopenia
• Motor or sensory impairment
• Gait and balance impairment
• Incontinence
• Cognitive Deficit/Depression
• Visual Impairment
• Orthostatic Hypotension

EXTRINSIC
• Medications: Psychotropics, Benzodiazepines, Diuretics, Cardiovascular
• Fall Risk Increasing Drugs – FRID (Polypharmacy)
• Environmental Factors
• Footwear
• Inappropriate Assistive Device or no assistive device
Risk factors for Falls

- Medications
- Medical Conditions
- Gait & Balance Impairment
- Vision & Hearing Impairment
- Cognitive Impairment & Confusion
- Muscle weakness
- Inadequate diet and exercise
- Alcohol
- Risk taking behaviours
- Environmental hazards
- Females
- Age > 80

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Etiology of Falls

• Fall related injuries result from combination of factors:
  – Muscle weakness
  – History of falls
  – Gait deficit
  – Balance deficit
  – Dizziness
  – Improper use of assistive device

• Multi-factorial due to medically complex older patients
Fall Related Injuries

- Hip Fracture – 90% fall related
- Occur in 65 and older population
- Poor Outcomes
- 25% mortality rate within one year
Other Fall Related Injuries

- Spinal Cord Injury
- Traumatic Brain Injury
- Wrist Fracture
- ER Visits
Intervention for Falls

- Special Report from CDC - Sept 2016
- Stopping Elderly Accidents Death and Injury (STEADI)
- CDC Website – [www.cdc.gov](http://www.cdc.gov)
Prevention Management

• Fall related injury prevention versus fall prevention.
  – Individualized assessment

• May require multi-disciplinary approach and input
Individualized Approach

- Screen/Assess; further re-assess
- Identify individual risk factors
- Reduce risk factors
  - Environment and behavioral
  - Improve what can be improved
- Patient must recognize the dangers
- Teach safe behaviors
- Increase level of assistance
Fall Risk Assessment

- Gait Speed (10 Meter Walk Test)
- Timed Up and Go
- 30 Second Sit to Stand
- 4 Stage Balance Test
10 Meter Walk Test

• Walking speed – the 6th Vital Sign (Fritz and Lusardi, 2008)
  – 2.2 mph = 1.0 m/sec – community ambulator
  – Less than (1.0 mph = 0.447 m/sec.) fall risk rises exponentially

• Gait velocity strong predictor of fall risk
• Faster to administer than TUGT
Walking Speed
[meter per second (m/s)]

- Dependent in ADL’s and IADL’s
- More likely to be Hospitalized
- Need Intervention to Reduce Falls Risk
- Less likely to have Adverse Event
- D/C to SNF
- D/C to Home more likely
- Household Walker
- Limited Community Ambulator
- Community Ambulator
- Cross Street & Normal WS

Fritz & Lusardi, 2009
4 Stage Balance Test

1. Feet together stand
   - Hold for 10 seconds

2. Semi-tandem stand
   - The person chooses which foot is placed in front
   - Hold for 10 seconds

3. Tandem stand
   - The person chooses which foot is placed in front
   - Hold for 10 seconds

4. One leg stand
   - The person chooses which leg to stand on
   - Timing starts as soon as the person raises one foot off the ground
   - We chose to extend the maximum length of time of the one leg stand test from 10 seconds to 30 seconds to lessen the ceiling effects of this test.
Test Cut-off Scores for Fall Risk

• Timed up and Go (TUG) - >13.5 sec
• 30 Sec Sit to Stand – 15x
• 4 Stage Balance Test – 10 sec for each position
Physical Therapy

• Assess for fall risks
• Develop plan and strategies to avoid falls and decrease fall risks
• Educate individuals and the society about fall prevention
Physical Therapy

Should be individualized and include:

• Exercise – stretching and strengthening
• Balance Training
• Gait Training, weight bearing exercise
• Home evaluation
• Footwear assessment
• Teach safety and fall recovery
• Improve Falls Self-efficacy
Evidence

- 59 Systematic Reviews
- 1460 articles
- 8 databases
- Recent study on non-pharmaceutical interventions for fall prevention
  (Rimland et al., 2016)
Results

• Multi-factorial approach with strength training and balance interventions most effective PT interventions for fall reduction.
References


