

# Fall Prevention for the Elderly

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# Incidence/Prevalence of Falls

- Fall-related injuries and deaths in older adults are a major health problem worldwide
- 30% individuals >65 y.o. fall at least 1x/yr and about ½ of these fall recurrently
- Falls are most common cause of nonfatal injuries and hospital admissions for trauma among older adults
- Unintentional injury, which most often results from falls, ranks as the 6<sup>th</sup> leading cause of death among people 65+
- In 2005, 15,800 people 65+ died from injuries related to falls and 1.8 million people 65+ were treated in ER for nonfatal injuries from falls
  
- Carter, Kannus, and Khan (2001)
- [www.cdc.gov](http://www.cdc.gov)

# Incidence/Prevalence of Falls

- In nonfatal falls, almost half of fallers are unable to get up without help
- Numbers of falls continue to increase
- Trend toward increasing aging population, so these problems may become more prevalent
- Affects people of all ethnicities, cultures, and socioeconomic situations

- Carter, Kannus, and Khan (2001)
- [www.cdc.gov](http://www.cdc.gov)

# Cost/Long Term Effects of Falls

- Major source of death and injury in the elderly
- In 2000, direct medical costs totaled \$179 million for fatal falls and \$19 billion for nonfatal fall injuries
- People 75+ who fall are 4-5x more likely to be admitted to a long-term care facility for a yr or longer
- In 2000, TBI accounted for 46% of fatal falls among older adults
- Many people who fall develop a fear of falling, which may cause them to limit activities, leading to reduced mobility and physical fitness, and increasing their actual risk of falling
  
- Carter, Kannus, and Khan (2001)
- [www.cdc.gov](http://www.cdc.gov)

# Cost/Long Term Effects of Falls Cont.

- Most common fractures are of the spine, hip, forearm, leg, ankle, pelvis, upper arm, and hand
- Cause 90% of hip fractures
- 12-20% of hip fractures have a fatal outcome
- In 2000, annual costs associated with fall-related fractures were estimated at \$10 billion
- Incidence of hip fractures continues to rise

- Carter, Kannus, and Khan (2001)
- [www.cdc.gov](http://www.cdc.gov)

# Risk Factors/Causes of Falls

- Risk of falling rises with increased age
- Age-related changes
  - Somatosensory, vestibular, and visual systems, which contribute to maintenance of balance
  - Diminished joint position sense
  - Decrease in lean muscle mass and strength
    - Decline 30-50% between ages 30 and 80
  - Bone loss
    - Loss begins in 3<sup>rd</sup> decade of life
    - Contributes to fracture risk
  - Decreased flexibility

- Carter, Kannus, and Khan (2001)
- [www.cdc.gov](http://www.cdc.gov)

# Risk Factors/Causes of Falls Cont.

- Inactivity
  - Medication use
    - Sedatives, hypnotics, antidepressants, antihypertensives
  - Some medical conditions
    - Parkinson's disease, stroke, hypotension, depression, epilepsy, dementia, eye diseases, dizziness and vertigo, peripheral neuropathy
  - Previous history of falls
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- Carter, Kannus, and Khan (2001)
  - [www.cdc.gov](http://www.cdc.gov)

# How to Decrease Risk of Falls

- Regular exercise
    - Can reduce many risk factors for falling
    - Can modify strength, flexibility, balance, and reaction time
  - Reduce medication use
  - Review medication side effects and interactions
  - Have eyes checked by an eye doctor at least once per year
  - Replace old, worn shoes
  - Improve lighting in the home
  - Reduce hazards in the home (See safety tips)
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- Carter, Kannus, and Khan (2001)
  - [www.cdc.gov](http://www.cdc.gov)

# Literature

- Tinetti et. al.
  - Subjects: Community-dwelling older adults 70+
  - Intervention Group: combination of adjustment in meds, behavioral instructions, and exercise programs (gait or transfer training, balance, and strengthening programs 2x/day for 15-20 min per session for 3 months)
  - Control group: usual health care + social visits.
  - Results: Significant difference between groups in length of time to first fall and in proportion of subjects who fell. At one year follow-up, 35% of intervention group fell, as compared to 47% of the control group.

# Literature Cont.

- Robitaille et al
  - Intervention Group: Biweekly group-based exercise sessions over 12 weeks coupled with home-based exercises at least 1x/wk
  - Exercise program designed to enhance system involved in balance including proprioception, leg strength, and ankle mobility.
  - Control Group: no exercise
  - Outcomes: one-legged stance test, tandem stance, functional reach, lateral reach, tandem walk test, sit-to-stand transfer, 4 m maximal walking speed, grip strength
  - Results: Intervention group improved more than control group on all static balance tests except one and showed greater improvement in mobility and strength

# Literature Cont.

- Wolf et al: Tai Chi resulted in 48% reduction of falls in participants (mean age 76 yrs) compared with controls
- Campbell et al: lower limb strength and balance exercises for 30 min, 3x/wk plus additional walking resulted in significantly reduced annual rate of falls among women 80+ y.o. compared with control women. The benefit of exercise continued in a 2 yr follow-up.

# Literature Cont.

- Buchner et al: Strength, endurance and flexibility training in community-dwelling elderly individuals resulted in fewer falls in the 1<sup>st</sup> year (42%) compared with controls (60%)
- Taaffe et al: Once-weekly resistance training improved strength and neuromuscular performance in older adults

# Exercise Program

- See Appendix A

# Safety Tips

- See Appendix B

# Importance to Physical Therapy

- Numerous older adults are referred to PT for balance issues or for fractures after falls
- We have a responsibility to help prevent falls by prescribing exercise programs and through education!!

# Future Research

- Impact of socioeconomic status on falls
- Impact of ethnicity and gender on falls
- LifeAlert Bracelet: How accessible?
- Effect of aquatic exercise on fall occurrence

# Links/Resources

- What is being done?
  - CDC supports research on ways to help prevent falls among older adults
  - <http://www.cdc.gov/ncipc/duip/preventadultfalls.htm>
    - Can download and print resources at no cost
- NIHSeniorHealth
  - <http://nihseniorhealth.gov>

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