

FALLS



**UCLA MULTICAMPUS PROGRAM
OF GERIATRICS AND GERONTOLOGY**



Falls in Older People

- **Common**
- **High mortality, morbidity, service use**
- **Many causes and risk factors**
- **Potentially preventable**

Fall Incidence in Older Adults

(Rate per person/year or bed-year)

| Type of Fall | At home | Hospital | Nursing Home |
|--------------|---------|----------|--------------|
| Any Fall | 0.3 | 1.5 | 1.7 |
| Severe Fall | 0.3 | 0.3 | .35 |
| Fracture | .01 | .05 | .07 |
| Hip Fracture | .003 | | .02 |



Mortality Outcomes of Falls

- Falls: The 7th leading cause of death in older adults
- Deaths from falls: 2/3 of accidental deaths
- 72% of U.S. fall-related deaths occur in the 13% of population >65 years of age



Morbidity Outcomes of Falls

- 5% result in severe soft tissue injuries, another 5% fracture, with 1% (300,000) involving hip
- 18% of all restricted activity days related to fall injuries
- 40-73% of fallers report “fear of falling”
- 42% of fallers reduce activity after fall



Service Utilization due to Falls

- Every year: 8% of population >70 years old have ER visits for a fall
- 1/3 of these are hospitalized
- 5.3% of all hospital admissions are due to falls
- Mean hospital LOS is 8-15 days



Service Utilization due to Falls

- U.S. cost for fall = \$12.6 billion (1989)
- Cost for hip fracture > 10 billion (1996)
- Falls are associated with NH entry
- > 50% of the patients with hip fracture discharged to NH, and 25% remain at NH 1 year after discharge



Causes of Falls

| | |
|------------------------------|------------|
| Accidents/Environment | 31% |
| Gait/Balance disorder | 17% |
| Dizziness/Vertigo | 13% |
| Drop attack | 10% |
| Confusion | 4% |
| Postural hypotension | 3% |
| Vision problem | 3% |
| Other specified | 15% |
| Unknown | 5% |

Most falls are multifactorial in origin, resulting from INTERACTION between the impaired stability of an individual and the hazards and demands of the environment.





Aging-related Changes:

Contributors to “Accidental” Falls

- **Gait changes**
 - feet not picked up high
 - slower gait (~1%/yr), shorter steps, decreased strength
- **Postural instability**
 - decreased proprioception and slowed processing (increased sway)
 - altered balance response
- **Impaired vision, hearing, memory**



Risk Factors for Falls

- Weakness
- History of falls
- Gait deficits
- Balance deficits
- Use assistive device
- Vision deficits
- Arthritis
- Impaired ADL
- Cognitive deficits
- Medications



Environmental Risk Factors

- Unstable furniture
- Stairs & rails
- Floor surfaces and rugs
- Poor lighting
- Bathrooms
- Floor clutter
- Pets



Clinical Approach to Falls

- **Assess and treat any injury**
- **Determine probably cause**
 - history, physical, tests
- **Prevent recurrence**
 - treat underlying cause or illness
 - reduce risk factors (weakness, gait/balance, vision, polypharmacy, orthostasis, etc.)
 - reduce environmental hazards
 - adaptive behavior



Taking the Falls History

- **Circumstances of the fall**

- ? sudden loss of consciousness
- ? palpitations/angina
- ? cough/urination
- ? dizziness
- ? position change
- ? sudden leg weakness
- ? tripped
- ? head back or far to side
- ? tight collar

- **Major Medical Problems**

- **Drugs**

- psychoactive
- cardiac, hypotensive



Physical Exam: Key Aspects

- **Vital signs: Postural BP/Pulse changes**
- **HEENT: Vision, hearing, nystagmus**
- **Neck: ROM, motion induced vertigo, bruit**
- **Chest: CHF, arrhythmia, murmur**
- **Extremities: Arthritis, ROM, deformities**
- **Neuro: gait/balance, weakness, tremor, rigidity, neuropathy**



Physical Maneuvers in Evaluation of Balance

- **Getting up from chair**
- **Sitting down in chair**
- **Standing** (narrow stance, eyes open/closed)
- **Nudge on sternum**
- **Neck turning**
- **Bending over**



Physical Maneuvers in Evaluation of Gait

- Step initiation
- Step height
- Step continuity
- Step symmetry
- Path deviation
- Turning



Gait and Balance Evaluation

- **Get-Up-And-Go Test**
- **Tinnetti Gait and Balance Evaluation**



Interventions

- **Physical components**
 - balance, strength, endurance
- **Behavioral components**
 - fear, confidence, cognition
- **Modification of environmental barriers**



Evidence Weighting

- **A. Consistent findings in multiple randomized controlled trials or a meta-analysis**
- **B. Single randomized controlled trial or weak inconsistent findings in multiple randomized controlled trials**
- **C. Limited scientific evidence, cohort studies, flawed randomized controlled trials, panel consensus**



Categories of Evidence and Recommendations

- Exercise intervention alone
- Multifaceted interventions
- Assessment in the community
- Assessment in residential setting



Efficacy of Exercise Intervention Alone (evidence from 8 clinical trials)

- **Unselected groups - most exercise programs without other interventions do not reduce the incidence of falls in unselected older people living in community (A)**
- **Balance training - T'ai Chi classes with individual tutoring can reduce the number of falls in older people by almost half (B)**



Tai Chi and Falls (FICSIT Trial)

- **Study design: randomized clinical trial**
- **Sample size: 200**
- **Characteristics of the participants**
 - elderly persons living in the community
 - mean age 76.2 years
 - female 81%



Tai Chi and Falls (FICSIT Trial)

- **Interventions (3 arms)**
 - Tai Chi (TC)
 - Computerized balance training
 - education (control group)
- **Length of intervention: 15 weeks**
- **Duration of follow up: 4 months**



Tai Chi and Falls (FICSIT Trial)

- **Main findings for TC intervention**
 - lowered BP following TC participation
 - reduced fear of falling responses compared to ED group (P=0.046)
 - reduction of fall risk by 47.5%



Efficacy of Exercise Intervention Alone (evidence from 8 clinical trials)

- **Selected groups (women over 80) - individually tailored exercise program administered by a qualified professional reduce the incidence of falls in a selected high risk group living in the community (B)**
- **Selected groups (mild deficits in strength and balance) - exercise program reduce the risk of falls in a selected group of older people living in community (C)**



Recommendations for Exercise Intervention Alone

- **Unselected groups - With the exception of Tai Chi classes, exercise programs for prevention of falls should not be established in unselected older people in the community**
- **Selected groups - individually tailored exercise program administered by qualified professionals targeted at people over 80s or older people with mild deficits in strength, balance, range of motion should be established**



Efficacy of Multifaceted Intervention (evidence from 5 clinical trials)

■ General model

- medical assessment, change in prescribed medications**
- home safety assessment and advice, environmental change**
- tailored exercise, training in transfer skills and gait**
- referral to other healthcare professionals according to need**



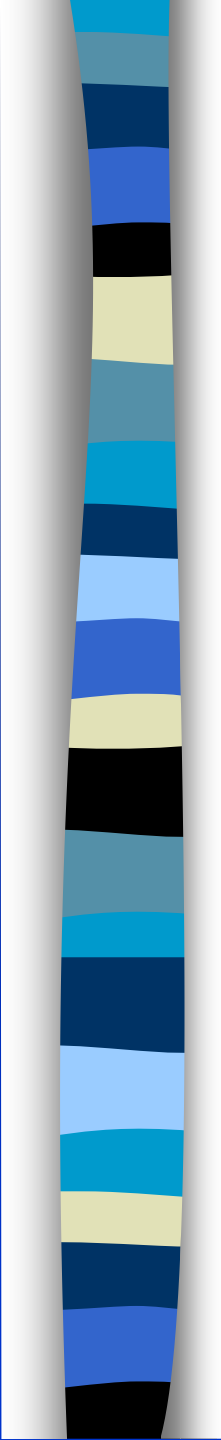
Efficacy of Multifaceted Intervention (evidence from 5 clinical trials)

- **Programs that combine interventions (some form of exercise) reduce falls (A)**
- **Specific factors to target (B)**
 - **postural hypotension**
 - **number of drugs**
 - **balance**
 - **transfers**
 - **gait**



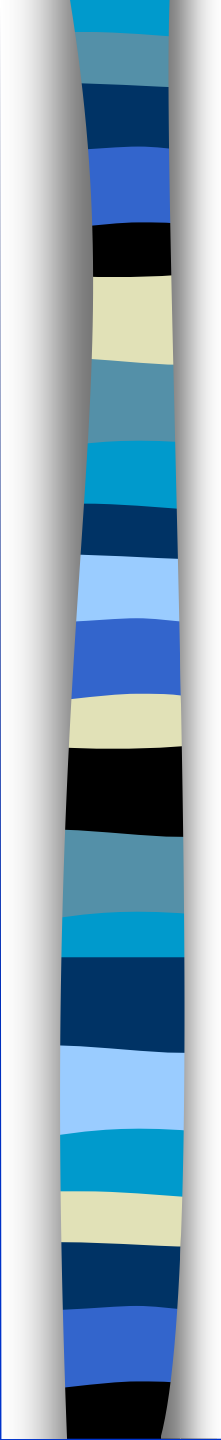
Recommendations of Multifaceted Intervention

- **Prioritize programs that include more than one intervention**
- **Prioritize correction of postural hypotension, rationalization of drugs where possible, and intervention to improve balance, transfers, and gait**



Assessment in the Community (evidence from 6 clinical trials)

- Home assessment of disability and education in the risk areas and referral to the patient's doctor reduces falls (C)
- Home assessment of risk and education without further referral does not reduce falls (A)
- Identification of patients who attend ER after falls, with subsequent assessment of medical and occupational therapy and referral and follow up, reduces falls (B)



Assessment in the Residual Settings (evidence from 4 clinical trials)

- All residents - non-selective exercise programs for residents of NH do not reduce falls (B)
- High risk residents - assessment of resident after falls, with development of individual treatment plans and staff education, decreases falls (B)
- Hip protector - hip fractures are prevented by hip protectors being worn by residents of NH, but compliance is a problem (A)



Prevention of Hip Fracture with Hip Protector

- **Study design: randomized clinical trial**
- **Sample size: 1801**
- **Characteristics of the participants**
 - ambulatory but frail elderly adults
 - mean age 82 years
 - female 78%
- **Duration of intervention: 1 month**



Prevention of Hip Fracture with Hip Protector

- **Main findings for hip protector intervention**
 - relative hazard in hip protector group: **0.4 (95% CI, 0.2 - 0.8)**
 - **4 subjects had a hip fracture (among 1034 falls) while wearing the protector, and 9 had a hip fracture (among 370 falls) while not wearing the protector**



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