

Preventing Hip Fractures

Presented by:

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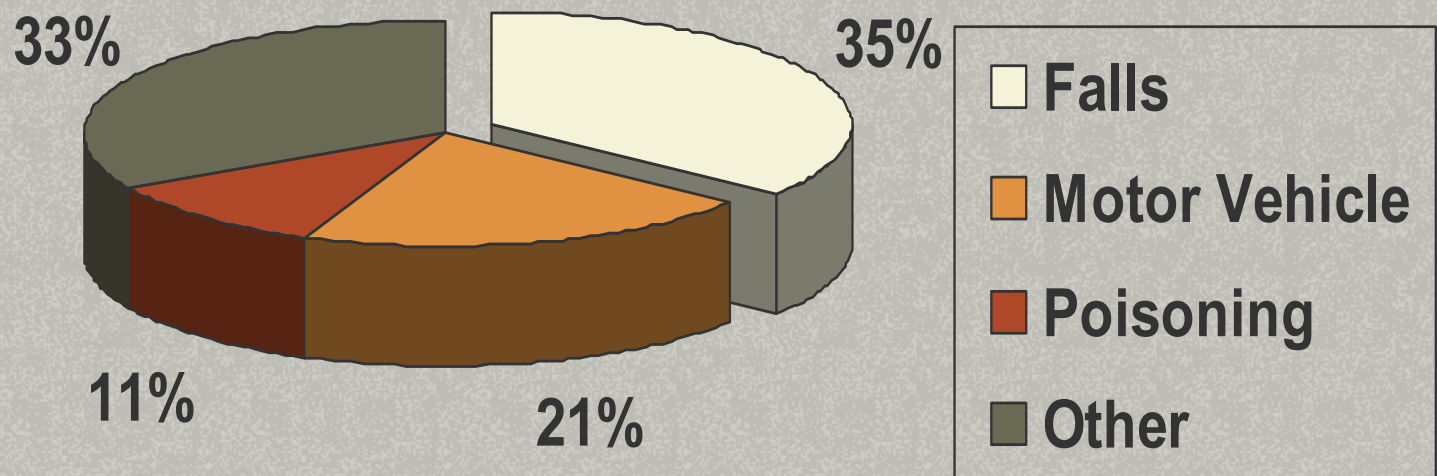


Hip Fracture Facts

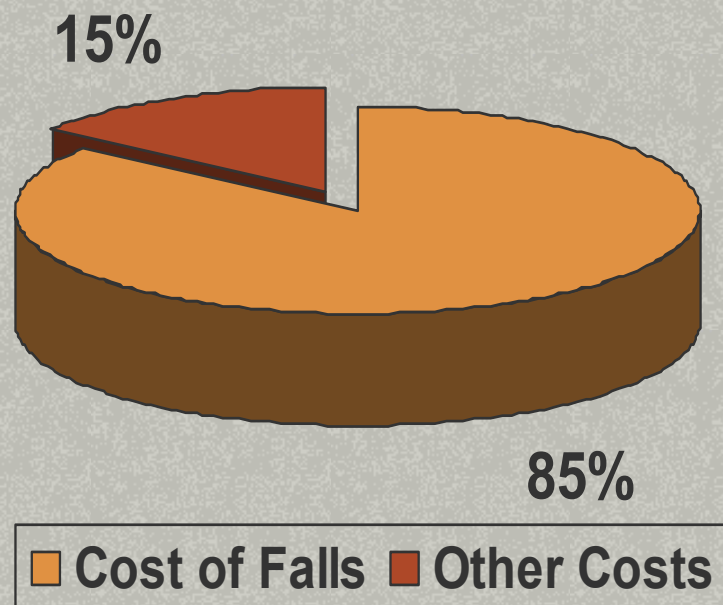
- 40% of hospital admissions for fall injuries are for hip fractures
- 90% of hip fractures are due to a fall
- 90% of hip fractures occur among those aged 70+
- 50% of post hip fracture patients require permanent use of assistive devices for walking
- 30% of hip fractures occur among the 5% of seniors living in institutional / residential setting

BC Injury Burden 1998

- Fall injuries accounted for the largest portion (35%) of the \$2.1 billion spent on direct and indirect costs for unintentional injuries for all ages



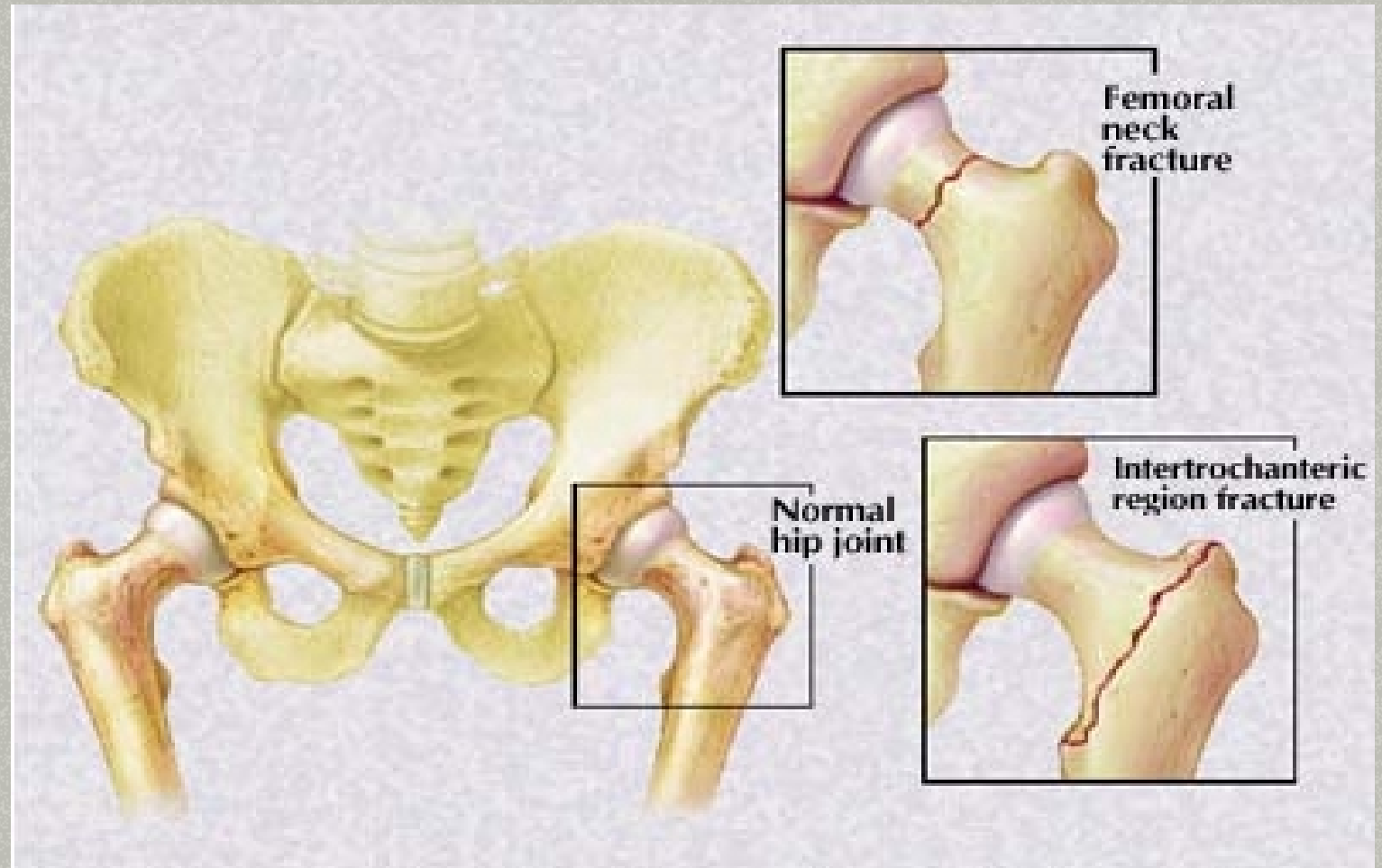
Cost for Injured Elderly 1998



- For persons aged 65 years and older fall injuries accounted for 85% of the \$211 million for direct treatment

Common types of hip fractures:

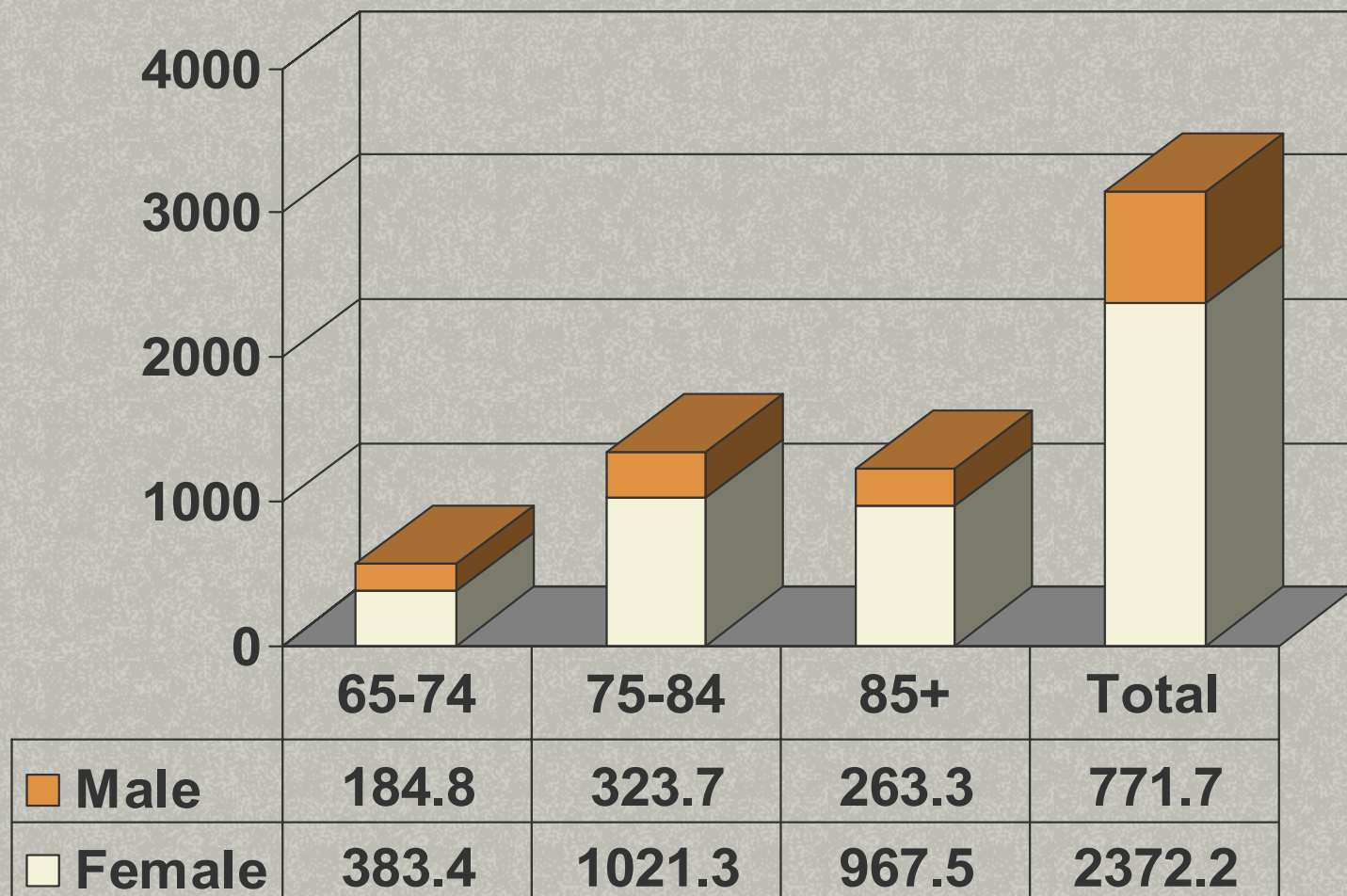
Femoral neck fracture (1-2 inches from hip joint)



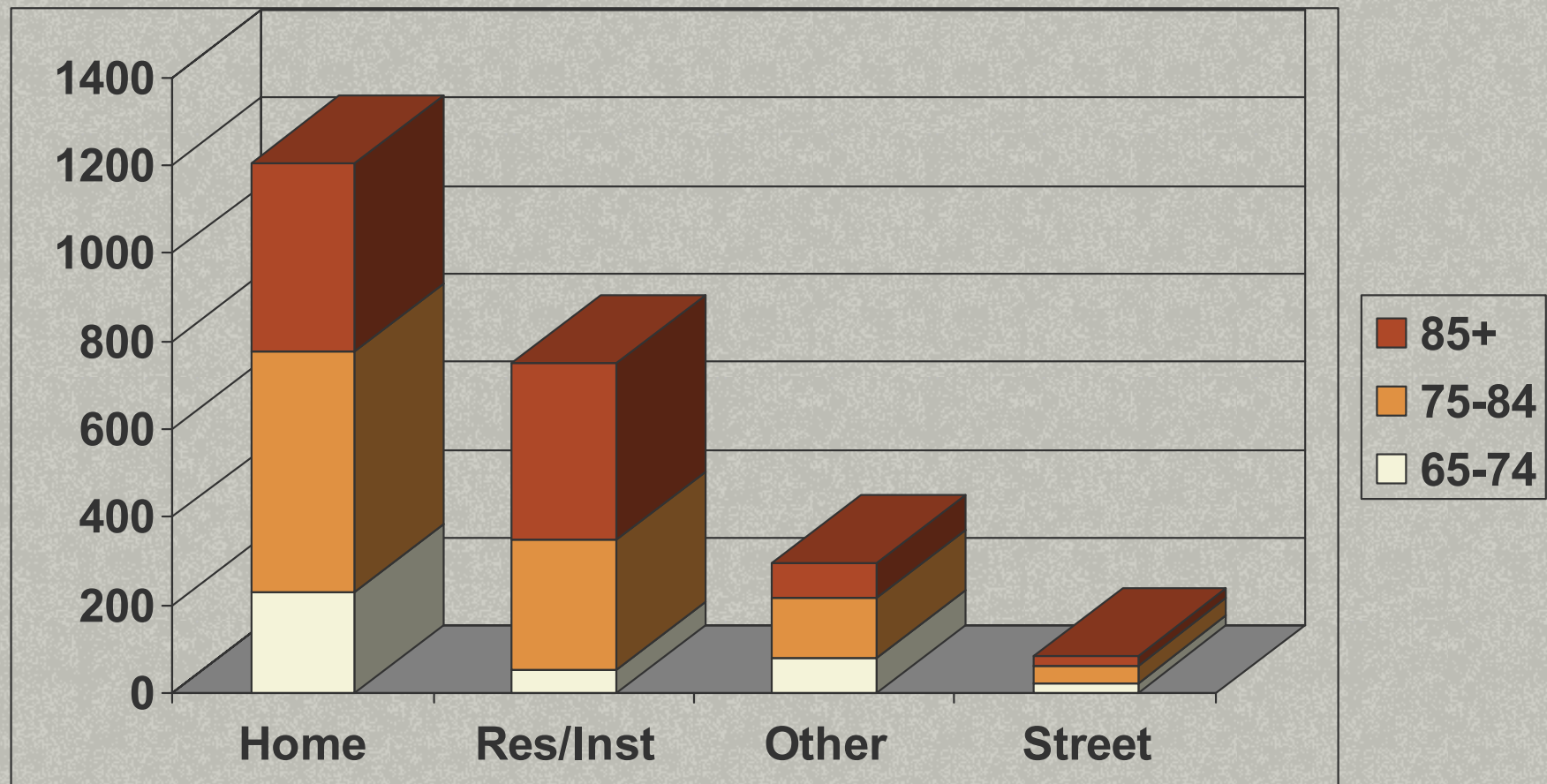
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Intertrochanteric fracture (3-4 inches from the hip joint)

Hip Fractures due to a Fall, Average Annual Hospital Cases Ages 65+, BC 1989/90-2000/01

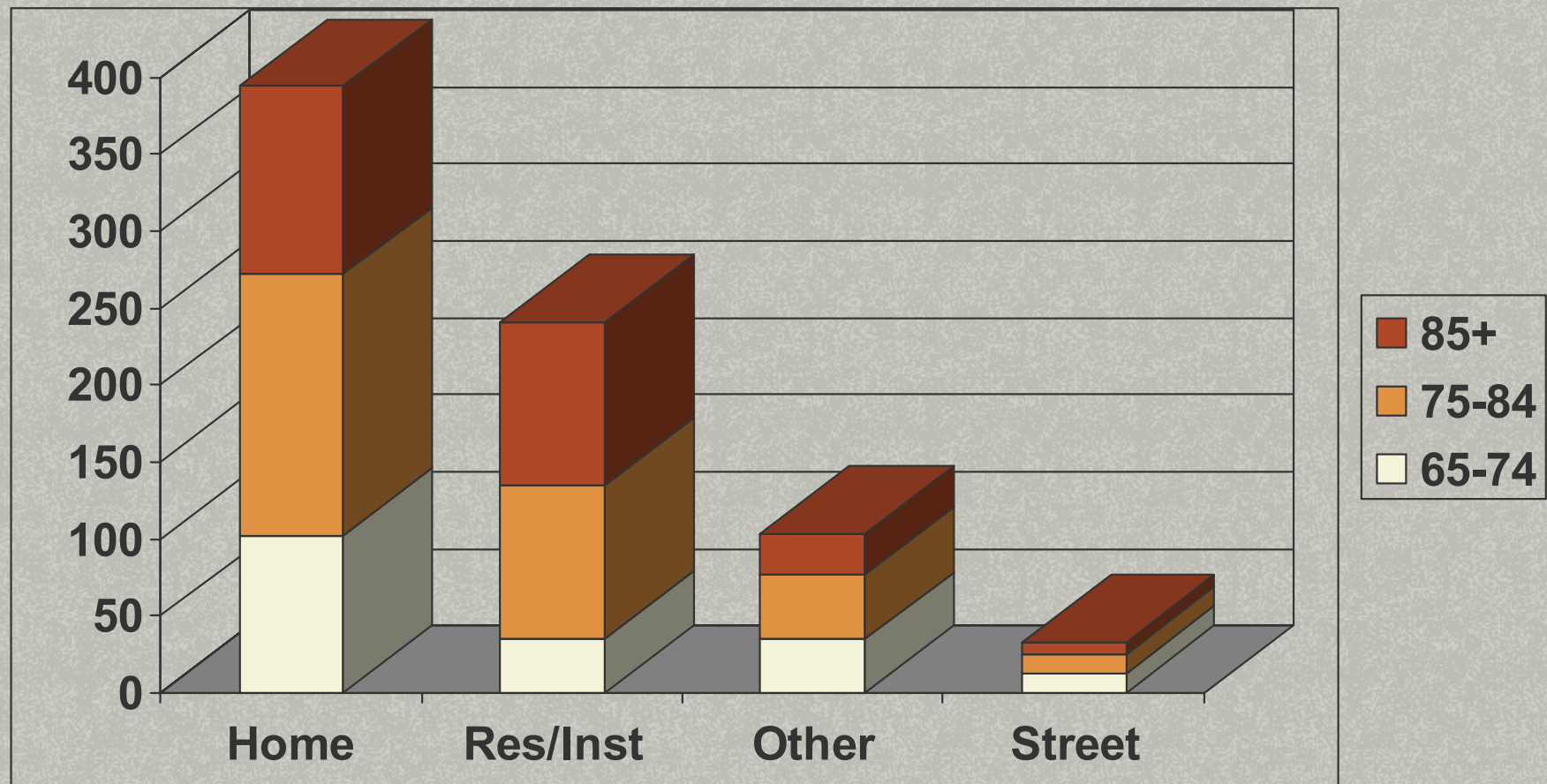


Hip Fractures due to a Fall by Location,
Average Annual Hospital Cases
Females Ages 65+, BC 1989/90-2000/01





Hip Fractures due to a Fall by Location, Average Annual Hospital Cases Males Ages 65+, BC 1989/90-2000/01





Who is at Risk?

- For women the risk is 1/7 over their lifetime and for men 1/17
- Women >5'8" are two times as likely than women <5'2"
- Those at risk of falling due to problems with balance, gait, muscle weakness or mental impairments
- Those with low bone density
 - Genetic predisposition
 - Lifestyle



Strategies for Preventing Hip Fractures

- Prevent falls
- Enhance bone density
- Protect the hip from impact



1. Proven Fall Prevention Strategies

- Exercise
- Environmental modifications
- Education
- Medication reviews
- Clinical Interventions
- Multi-factorial interventions






Multifactorial Targeted Falls Prevention Program for Community Elderly

Average Cost per High Risk Faller¹: Usual Care versus Treatment Group²

Costs	Usual Care	Treatment Group
Hospital costs	11,509	7,509
Intervention costs	0	906
Mean total costs	14,232	10,537

1. High risk refers to having at least four targeted risk factors for falls.

2. Rizzo, J., Baker, D., McAvay, G., & Tinetti, M. (1996). The cost-effectiveness of a multi-factorial targeted prevention program for falls among community elderly persons. *Medical Care*, 34(9), 954-969.



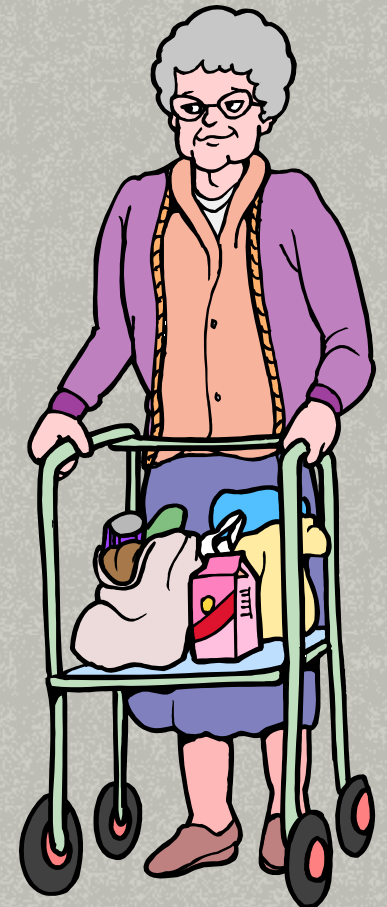
Falls Prevention in a Long-stay Hospital Unit (Barry et al., 2001)

- 95-bed Unit / average age 81 years
- Interventions included:
 - Risk assessments
 - Replacing footwear
 - Medication reviews
 - Muscle strengthening exercises
 - Hip protectors for those at high risk
 - OT-guided environmental modifications
- Findings: 20.5% of falls resulting in fractures pre-intervention reduced to 2.8% end of year 1 and no fractures by end of year 2.



2. Enhancing Bone Density

- Exercise
- Sunshine
- Calcium and Vitamin D
- Bisphosphonate alendronate
- Raloxifene



3. Protecting the Hip from Impact

- Energy shunting shields
- Energy absorbing pads





Evidence of Effectiveness

(Cochrane Review / Parker 2002)

■ Energy Shunting

- Harada 1998
- Kannus 2000
- Lauritzen 1993
- Villar 1998

■ Energy Absorbing:

- Heikinheimo 1996
- Chan 2000

■ Unknown

- Ekman 1997

■ Together, the 7 studies involved 3553 rest home or nursing home residents or frail elderly living at home with support, using 5 different HP designs

■ According to Cochrane analysis, “different types of HP used had equal effectiveness for prevention fractures” (Parker 2002, p. 7)



Results: Cluster randomized trials

Author (Type HP)	Length /# sites	HP Group	Control Group	RR
Ekman (unknown)	11 mos / 4 sites	4 ¹ /302	17/442	.33 (CI 0.11-1.00)
Lauritzen (Hard shell)	11 mos / 1 site	8 ¹ /247	31/418	0.44 (CI 0.21-.0.94)
Kannus (Hard shell)	9 mos /22 sites	13 ² /653	67/1148	0.34 (CI .34- 0.69)

¹Not wearing HP at time of fall

² 4/13 Wearing HP at time of fall

Results: Individual randomized trials

Author / Type of HP	Length /# sites	HP Group	Control Group	RR
Chan (Foam pad)	9 mos / 9 sites	3 ¹ /40	6/31	
Harada (Hard shell)	19 mos / 4 sites	1 ¹ /88	8/76	
Heikinheimo (Foam pad)	12 mos / 1 site	0/36	1/36	
Pooled data for individual randomized trials				0.24 (CI 0.09 – 0.65)
Summary data across all six trials		29/1313	130/2099	

¹HP not worn at time of fall



Study Limitations

- Results based on allocation of HP to intervention group but not actual use
- Cluster randomization used for 3 of 6 studies
- Limited ability to generalize findings outside high risk population and to other countries
- High attrition / low compliance



Evidence for HP Compliance

- Cameron 1994: 151(51%) LTC residents agreed to wear the HP. Daytime compliance 47% month 1, 30% at 6 months.
- Tracey, 1998: of 101 LTC women, 54 wore HP for less <1 week, with 27% compliant for whole study
- Hulbacher, 2001: 262 (68.2%) residents agreed to wear HP, 124 quit in start up of study, 138 (31.8%) wore HP 10 months



Compliance Issues

- Reasons given for non compliance:
 - appearance, comfort, fit, efficacy, ease of laundering and cost (Cameron 1994)
 - poor fitting and discomfort (Tracy 1998; Villars 1998)
 - Skin irritation (Ekman 1997; Kannus 2000)
 - Forgetfulness (Villars 1998)
- Enhancing compliance
 - Parkkari (1998) found that the attitude, education and motivation of LTC staff was a key element in achieving good user compliance with wearing hip protectors
- Variations on definition of compliance

Cost Effectiveness Segui-Gomez 2002

Total net cost in millions (1999 US\$)		Total net effectiveness		Implications for Hip Protector Use
		In lives	In QALYs	
Women (all)	1,215	5,906	32,000	Recommended
Age 65-74	182	579	4,000	Recommended
Age 75-84	553	2,239	18,000	Recommended
Age 85+	480	3,089	10,000	Recommended
Men (all)	135	5,962	26,000	Not recommend
Age 65-74	78	123	25,000	Not recommend
Age 75-84	117	1,429	5,000	Not recommend
Age 85+	96	1,109	4,500	Recommended



Recommendations

- More research needed on falls prevention, bone density enhancement, and HP efficacy and compliance
- RCTs needed in Canada with randomization by the individual in community and facility settings
- Unbiased, practice-based evaluation needed for efficacy, compliance and cost effectiveness across different designs



Web Site

- Falls prevention and injury prevention program evaluation:
 - BCIRPU <http://www.injuryresearch.bc.ca>

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