



Falls prevention strategies for community living older people

Clare Robertson



4th ANZFPS Conference Dunedin, New Zealand

Topics

- Definitions and methodology
- Effective falls prevention interventions
- Value for money from falls prevention strategies
- Facilitators and barriers to participation



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Definition of a fall



- An unexpected event in which the participants come to rest on the ground, floor, or lower level
- “In the past month, have you had any fall including a slip or trip in which you lost your balance and landed on the floor or ground or lower level?”

Lamb SE *et al.* J Am Geriatr Soc 2005;53:1618-22

Prospective daily reporting

VIP FALLS PREVENTION TRIAL
FALLS RECORD

1. At the end of each day, please place the letter “N” in the box if you did not fall, or the letter “F” in the box if you did fall.

2. At the end of each month, please detach the calendar for that month and post it. No stamp is necessary.

Thank you!

Any questions please phone:
Mrs Glynnis Clarke 474 7007 extension 8523
Dr Clare Robertson 474 7007 extension 8508

October 2002							FALLS
Sun	Mon	Tues	Wed	Thur	Fri	Sat	
		1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

- Daily falls calendars
- Monthly follow up
- Circumstances & consequences by telephone
- *Independent monitor*
- *Independent assessor*
- *Minimum 1 year*
- *Start at randomisation*

Falls vs fallers

- Number / rate of falls
 - **Negative binomial regression**
 - **Multiple event survival analysis**
- Risk of falling (fallers)
 - **Relative risk**
 - **Time to first fall**

Donaldson MG *et al.* Age Ageing 2009;38:151-5

Types of interventions



- Single
 - **Exercise, home safety, medication review**
- Multiple
 - **Same intervention to all (eg exercise + home safety)**
- Multifactorial
 - **Individual assessment, interventions based on risk factors identified**

ProFaNE (Prevention of Falls Network Europe)

Cochrane review

- Community living older people aged ≥ 60 years
 - **111 RCTs, n = 55,303**
 - 43 exercise alone
 - 31 multifactorial
 - 13 vitamin D
 - 10 multiple (8 with exercise)
 - 8 home safety

Gillespie LD *et al.* Cochrane Database Syst Rev 2009(2) Art. No.: CD007146

Exercise programmes

- Effect of exercise programmes in reducing the rate and risk of falling “should now be regarded as established”
- Group exercise, multiple components
 - **Rate ratio 0.78 95%CI 0.71 – 0.86**
- Individual exercise at home
 - **Rate ratio 0.66 95%CI 0.53 – 0.82**
- Tai chi
 - **Rate ratio 0.63 95%CI 0.52 – 0.78**
- Effective when selected/not selected for risk of falling ↑

Gillespie LD *et al.* Cochrane Database Syst Rev 2009(2) Art. No.: CD007146

Balance training is key

- 44 RCTs community and residential care
 - **Rate ratio 0.83 95%CI 0.75 – 0.91**
- Challenging balance exercises, >50 hours over the trial period, no walking programme
 - **Rate ratio 0.58 95%CI 0.48 – 0.69**
- Lesser effect in higher risk participants (P=0.09)
- One trial only with balance alone (Wolf 1996) NS

Sherrington C *et al.* J Am Geriatr Soc 2008;56:2234-43

Effective single strategies

- Home safety assessment and modification (6 trials)
 - **Risk of falling 21% ↓**
- Vitamin D (if lower levels, 2 trials)
 - **Rate of falls 43% ↓**
- Gradual withdrawal of psychotropic medication (1 trial)
 - **Rate of falls 66% ↓**
- Medication review (GP one-on-one with pharmacist)
 - **Risk of falling 39% ↓**
- Cataract surgery, pacemakers, single lens glasses

Clemson L *et al.* J Aging Health 2008;20:954

Gillespie LD *et al.* Cochrane Database Syst Rev 2009(2) Art. No.: CD007146

Multifactorial intervention

Clinic based

- Postural hypotension
- Visual acuity
- Balance
- Cognition
- Depression
- Carotid sinus studies
- Medication review
- Home safety assessment and advice

Home based

- Postural hypotension
- Sedative medications
- Use of ≥ 4 medications
- Transfer skills, grab bars
- Environmental hazards
- Gait training, assistive device
- Balance exercises, exercises against resistance

Close J *et al.* Lancet 1999;353:93-7

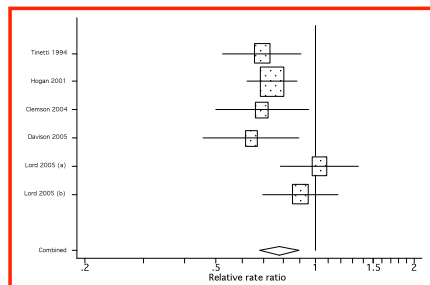
Tinetti ME *et al.* N Engl J Med 1994;331:821-7

Multifactorial interventions

- Risk of falling (19 trials)
 - **RR 0.91 95%CI 0.82 – 1.02**

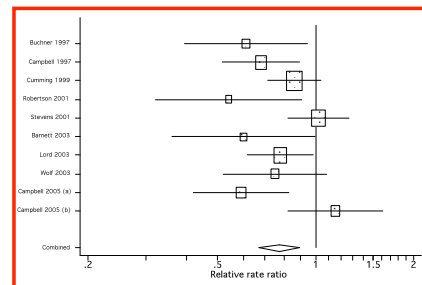
Gates S *et al.* BMJ 2008;336:130-3
- Risk of falling (26 trials)
 - **RR 0.95 95%CI 0.88 – 1.02**
- Rate of falls (15 trials)
 - **Rate ratio 0.75 95%CI 0.65 – 0.86**
- Selected for higher risk of falling
 - **Rate ratio 0.76 95%CI 0.64 – 0.91**
- Active intervention vs referral (both effective)

Gillespie LD *et al.* Cochrane review 2009(2) Art. No.: CD007146



Multifactorial interventions (initial pooling)

Campbell AJ & Robertson MC. Age Ageing 2007;36:656-62



Single interventions (initial pooling)

Campbell AJ & Robertson MC. Age Ageing 2007;36:656-62

Multifactorial vs single

- Multifactorial & single equally effective
 - Multifactorial: falls 22%↓
 - Single: falls 23%↓
- Exercise more effective than multifactorial
 - Exercise alone x5 more effective

Campbell AJ & Robertson MC. Age Ageing 2007;36:656-62
Petridou ET *et al.* J Aging Health 2009;21:713

Economic evaluation

- 111 RCTs in community living older people



- Cost effectiveness evaluations in RCTs:

- Home based multifactorial
- Home safety x 2
- Otago Exercise Programme x 2
- Tai chi
- Cataract surgery

Value for money

- Potential for fall related cost savings:
 - Otago Exercise Programme ≥80 years
 - Home safety (fallers discharged from hospital)
 - Home based multifactorial programme (4 of 8 risk factors)
- “Cost effective” ≠ “Cost saving”
- Expedited cataract surgery (2004 prices)
 - £35,704 per QALY gained (1 year)
 - £13,172 per QALY gained (expected lifetime)

Number of fall events prevented per 100 person yrs

Subgroup	Falls	Injurious falls
Aged ≥80, fall(s) in previous year	54	29
Fall(s) in previous year	44	21
Aged ≥80	41	20
All participants (65 to 97 years)	34	16
Aged ≥80, no fall in previous year	26	12
No fall in previous year	24	11
Aged 65 to 79	5	-2




Scandinavian Journal of Public Health, 2009; 37: 584-589

ORIGINAL ARTICLE

Cost-effectiveness in fall prevention for older women

LIV F. HEKTOEN¹, ELINE AAS² & HILDE LURÅS³

Otago Exercise Programme
Reduction in healthcare costs =
1.85 x cost of delivery

Otago Exercise Programme
to prevent falls in older adults

A home-based, individually tailored strength and balance training programme


<http://www.acc.co.nz/oep>

Barriers	Facilitators
<ul style="list-style-type: none"> ■ Fatalism ■ Denial/under-estimation of risk of falling ■ Poor self-efficacy, fear of falling ■ No previous exercise ■ Poor health and functional ability ■ Stigma 	<ul style="list-style-type: none"> ■ Social support ■ Education ■ Involvement in decision making ■ Low intensity exercises ■ Program relevant and life enhancing

Bunn F *et al.* Ageing & Society 2008;28:449-72

Key points

- Wealth of evidence that falls can be prevented
- Use proven strategies with clear protocols
- Potential for cost savings
- Focus on potential benefit (not falls)



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