Falls prevention strategies for community living older people

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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

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?”

Prospective daily reporting
- 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

Prospective daily reporting
- Daily falls calendars
- Monthly follow up
- Circumstances & consequences by telephone
- Independent monitor
- Independent assessor
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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
  - 115 RCTs, n = 55,303
    - 43 exercise alone
    - 31 multifactorial
    - 13 vitamin D
    - 10 multiple (8 with exercise)
    - 8 home safety


**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


**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


**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

**Multifactorial intervention**

<table>
<thead>
<tr>
<th>Clinic based</th>
<th>Home based</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postural hypotension</td>
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<tr>
<td>Visual acuity</td>
<td>Sedative medications</td>
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<tr>
<td>Balance</td>
<td>Use of ≥4 medications</td>
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<tr>
<td>Cognition</td>
<td>Transfer skills, grab bars</td>
</tr>
<tr>
<td>Depression</td>
<td>Environmental hazards</td>
</tr>
<tr>
<td>Carotid sinus studies</td>
<td>Gait training, assistive device</td>
</tr>
<tr>
<td>Medication review</td>
<td>Balance exercises, exercises against resistance</td>
</tr>
<tr>
<td>Home safety assessment and advice</td>
<td></td>
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</tbody>
</table>


**Multifactorial interventions**

- Risk of falling (19 trials)
  - RR 0.91 95%CI 0.82 – 1.02
- 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 vs single
- Multifactorial & single equally effective
  - Multifactorial: falls 22%
  - Single: falls 23%
- Exercise more effective than multifactorial
  - Exercise alone x5 more effective

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

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Falls</th>
<th>Injurious falls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aged ≥80, fall(s) in previous year</td>
<td>54</td>
<td>29</td>
</tr>
<tr>
<td>Fall(s) in previous year</td>
<td>44</td>
<td>21</td>
</tr>
<tr>
<td>Aged ≥80</td>
<td>41</td>
<td>20</td>
</tr>
<tr>
<td>All participants (65 to 97 years)</td>
<td>34</td>
<td>16</td>
</tr>
<tr>
<td>Aged ≥80, no fall in previous year</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td>No fall in previous year</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>Aged 65 to 79</td>
<td>5</td>
<td>-2</td>
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</tbody>
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Otago Exercise Programme
Reduction in healthcare costs = 1.85 x cost of delivery

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

Barriers
- Fatalism
- Denial/under-estimation of risk of falling
- Poor self-efficacy, fear of falling
- No previous exercise
- Poor health and functional ability
- Stigma

Facilitators
- Social support
- Education
- Involvement in decision making
- Low intensity exercises
- Program relevant and life enhancing

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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