Falls prevention in dementia

Dr Morag Taylor
NSW Falls Network Forum
31 May 2019
Outline

1. Background
2. Risk factors for falls (brief)
3. Fall prevention
   a) Community
   b) Hospital
   c) RACF
4. Practical strategies
5. Summary
Dementia (major neurocognitive disorder)

• Progressive neurodegenerative disorder affecting cognition and as a result ability to function
• Cognitive decline: complex attention, executive function, learning and memory, language, perceptual-motor, or social cognition
• Cognitive deficits not better explained by another condition
  • E.g. delirium, depression
Dementia
Major neurocognitive disorder

Alzheimer's disease

Parkinson's disease dementia

Frontotemporal dementia

Vascular dementia

Mixed aetiology


Prevention better than cure?

Dementia prevalence and incidence

Who is affected?

Nearly 10 million new cases every year
One every 3 seconds

50 million people worldwide
Set to triple by 2050

Figure 2 Estimated number of Australians with dementia, 2016-2056

https://www.who.int/mental_health/neurology/dementia/infographic_dementia.pdf

Dementia and falls

Fall consequences: dementia

• Increased risk fall-injury
  – 2-3 fold increased risk of hip fracture
  – 2-fold increased risk of head injury

• Higher morbidity

• Higher mortality (2-fold)

• Less likely to receive rehab

• More likely to be placed in residential care


Draper B et al: The Hospital Dementia Services Project: age differences in hospital stays for older people with and without dementia. Int Psychogeriatr 2011; 23:1649-1658

Cognitive decline

- Normal age-related decline
- Preclinical
- MCI
  - Amnestic
  - Non-amnestic
  - Single domain
  - Multi-domain
- Dementia
  - Cognitive impairment
  - Impaired ADL
- Subjective cognitive complaint
- Objective cognitive impairment
- Preserved ADL
- Mild
- Moderate
- Severe

Adapted from https://www.mind.uci.edu/dementia/mild-cognitive-impairment/
Physical decline

- Cognitively normal
- MCI
- Dementia

**Graph:**
- Y-axis: PPA score
- X-axis: Time (years)
- Legend:
  - Remained cognitively normal
  - Progressed to AD phenotypes
  - Progressed to non-AD phenotypes

**References:**
Fall risk factors
Predominantly community-dwelling (83%)
Summary of fall risk factors

Medical conditions
e.g. arthritis, cerebrovascular disease, incontinence, acute illness

Cognitive and mental health
e.g. depression, anxiety, fear of falling, acute confusion, cognitive decline, BPSD

Physical condition
e.g. balance, reaction time, walking speed, functional impairment, physical inactivity

Medications
e.g. 4+ medicines, centrally acting medication, total number

Environmental hazards
e.g. poor lighting, trip hazards, footwear

Cognitive domains
Executive function, processing speed, visuospatial ability
Fall prevention
Efficacy of Physical Exercise in Preventing Falls in Older Adults With Cognitive Impairment: A Systematic Review and Meta-Analysis

Wai Chi Chan MRC Psych a, *, Jerry Wing Fai Yeung PhD b,

Effects of physical exercises on preventing falls in older adults with cognitive impairment

Overall, 32% reduction in rate of falls
<table>
<thead>
<tr>
<th>Community Study</th>
<th>Intervention</th>
<th>Fall Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shaw 2003, RCT, n=274, 22% community</td>
<td>Multifactorial, 3m supervised exercise</td>
<td></td>
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<tr>
<td>Suttanon 2013, feasibility RCT, n=40 AD</td>
<td>Home-based exercise and walking program, 6m</td>
<td>✗</td>
</tr>
<tr>
<td>Wesson 2013, pilot RCT, n=22 dyads</td>
<td>Home-based exercise and home hazard reduction, 3m</td>
<td>✓</td>
</tr>
<tr>
<td>Zieschang 2013, RCT, n=91</td>
<td>Progressive resistance and functional training (group), 3m</td>
<td>✓</td>
</tr>
</tbody>
</table>
| Pitkala 2013, RCT, 3-arm, n=210 AD + spouse | Group exercise, 12m  
Home exercise, 12m | ✓ |
| Zieschang 2017, RCT, n=110, 84% Community | Progressive resistance and functional training (group), 3m | ✓  
✗ |
| Lamb 2018, RCT, n=494 | Aerobic and strength training, 4m | ✗ |
Exercise to prevent falls in older adults: an updated systematic review and meta-analysis


45% reduction in rate of falls
Can a tailored exercise and home hazard reduction program reduce the rate of falls in community dwelling older people with cognitive impairment: protocol paper for the i-FOCIS randomised controlled trial

Jacqueline CT Close\textsuperscript{1,2*}, Jacqueline Wesson\textsuperscript{1,3}, Catherine Sherrington\textsuperscript{4}, Keith D Hill\textsuperscript{5}, Sue Kurrle\textsuperscript{6}, Stephen R Lord\textsuperscript{1}, Henry Brodaty\textsuperscript{7}, Kirsten Howard\textsuperscript{8}, Laura N Gitlin\textsuperscript{9}, Sandra D O'Rourke\textsuperscript{1} and Lindy Clemson\textsuperscript{3}
StandingTall – iPad app

Median (IQR) adherence

Individual adherence

Exercise duration goal

Tailored progression

<table>
<thead>
<tr>
<th>Study</th>
<th>Intervention</th>
<th>Fall Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mador 2004, pragmatic RCT, n=71, pt w confusion</td>
<td>Extended practice nurse, non-pharmacological approaches</td>
<td>X</td>
</tr>
<tr>
<td>Stenvall 2007, RCT, n=64</td>
<td>Geriatric unit specialising in geriatric orthopaedic management post NOF</td>
<td>✓</td>
</tr>
<tr>
<td>Haines 2011, RCT, n=300</td>
<td>Patient education: materials +/- physio</td>
<td>X</td>
</tr>
<tr>
<td>Hill 2015, Stepped-wedge, cluster RCT, rehab wards, n=1676</td>
<td>Patient education: materials +/- physio for ppts with MMSE &gt;23, combined with staff training and feedback</td>
<td>?</td>
</tr>
</tbody>
</table>
Multicomponent non-pharmacological delirium prevention interventions (Hshieh 2015)

• N=519 total, 119 falls (total)
• Predominantly medical patients
• Not dementia specific
• RCTs and non-RCTs

<table>
<thead>
<tr>
<th>Falls</th>
<th>Odds Ratio (95% CI)</th>
<th>Decreased falls, favors intervention</th>
<th>Increased falls, favors control</th>
<th>Weight, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babine et al, 2013</td>
<td>0.49 (0.19-1.27)</td>
<td></td>
<td></td>
<td>10.9</td>
</tr>
<tr>
<td>Caplan and Harper, 2007</td>
<td>0.33 (0.04-2.93)</td>
<td></td>
<td></td>
<td>2.5</td>
</tr>
<tr>
<td>Martinez et al, 2012</td>
<td>0.11 (0.01-2.05)</td>
<td></td>
<td></td>
<td>3.3</td>
</tr>
<tr>
<td>Stenvall et al, 2007</td>
<td>0.38 (0.23-0.65)</td>
<td></td>
<td></td>
<td>38.2</td>
</tr>
<tr>
<td>Fixed-effect model: P &lt; .001</td>
<td>0.38 (0.25-0.60)</td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
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<tr>
<th>Study</th>
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<tr>
<td>Jensen 2003, RCT, n=170 MMSE &lt;19, n=171 MMSE ≥ 19</td>
<td>Multifactorial, 11w</td>
<td></td>
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<tr>
<td>Shaw 2003, RCT, n=274</td>
<td>Multifactorial designed for community</td>
<td></td>
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<tr>
<td>Toulotte 2003, RCT, n=20, 15 residents</td>
<td>Group exercise, 4m</td>
<td></td>
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<tr>
<td>Rolland 2007, RCT, n=134 AD</td>
<td>Group exercise, 12m</td>
<td></td>
</tr>
<tr>
<td>Rosendahl 2008, RCT, n=191, 50% dementia Dx</td>
<td>High intensity functional group exercise, 3m</td>
<td>✓</td>
</tr>
<tr>
<td>Rapp 2008, RCT, n=148</td>
<td>Multifactorial, 12m</td>
<td>✓</td>
</tr>
<tr>
<td>Neyens 2009, RCT, n=518</td>
<td>Multifactorial, 12m</td>
<td></td>
</tr>
<tr>
<td>Study</td>
<td>Intervention</td>
<td>Fall outcome</td>
</tr>
<tr>
<td>--------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Chenoweth 2009, RCT 3-arm, n=289</td>
<td>Dementia care mapping and person-centred care, Person-centred care, 4m</td>
<td>✓</td>
</tr>
<tr>
<td>Klages 2011, RCT, n=24</td>
<td>Snoezelen sensory room, 6w</td>
<td>X</td>
</tr>
<tr>
<td>Kovacs 2013, RCT, n=86</td>
<td>OTAGO, supervised walk, multimodal, 12m</td>
<td>X</td>
</tr>
<tr>
<td>van de Ven 2014, RCT, n=318</td>
<td>Dementia care mapping, 4m</td>
<td></td>
</tr>
<tr>
<td>Whitney 2017, pilot cluster RCT, n=191</td>
<td>Multifactorial, 6m</td>
<td></td>
</tr>
</tbody>
</table>
Interventions for preventing falls in older people in care facilities and hospitals (Review)

- Residential care
- Multifactorial vs usual care
- Cognitively impaired participants (sub-group analysis)
  - No clear benefit on rate or risk of falls
    - Non-significant 17% reduction in rate of falls
      - RR 0.83 95%CI 0.57 – 1.40
    - Non-significant 21% reduction in risk of falls
      - RR 0.79 95%CI 0.57 – 1.12
Progressive Resistance and Balance Training for Falls Prevention in Long-Term Residential Aged Care: A Cluster Randomized Trial of the Sunbeam Program

Jennifer Hewitt BAppSc, MHealthSc, Stephen Goodall PhD, Lindy Clemson PhD, Timothy Henwood PhD, Kathryn Refshauge PhD

- 49% with diagnosed cognitive impairment, 56% in the intervention group (ACE-R baseline mean = 72)
Practical strategies
Identify, assess and consider cognitive impairment

Functional cognition

Global cognition, language, visuospatial

Processing speed and executive function
Prevent, recognise and treat delirium:
Delirium clinical care standard

- If at risk of delirium: screen for cognitive impairment on admission
- If acute change in behaviour or cognitive function: assess for delirium
- If at risk of delirium: delirium prevention strategies implemented
- If delirium: comprehensive intervention to treat causes
- If delirium: care based on fall and pressure risk
- Non-pharmacological management always first line, pharmacological (e.g. antipsychotics) last resort

Leaving hospital: individualised care plan developed in collaboration and communicated (GP, carer, pt), delirium information within 48 hours of discharge.

• Cognitive screening
• Delirium risk identification and preventive measures
• Assessment of older people with confusion
• Management of older people with confusion
• Effective communication to enhance care
• Staff education
• Supportive care environment
Person-centred care

- Care centred around the persons’ needs as an individual
- Shared goals based on persons’ values and experiences
- Past lived experiences
- Likes/dislikes
- Cultural and religious beliefs
- Precipitants to behaviours
- Specific behaviours are often a result of unmet needs
- Respect, dignity and compassion
Carer engagement

- Work in partnership and acknowledge their expertise
- Source of information
- Get to know the person e.g. TOP 5
- Communicate about the person with dementia’s needs
- Consider impact of intervention on carer
- Education and support for the carer
- Practical examples
- Focus on the individual's strengths
- How to help them keep doing what they can do

Communication

• Respect, empathy, listen
• Body language and tone of voice
• Body position e.g. eye contact
• Speak slowly, clearly, no jargon
• Short sentences/break down instructions
• Allow processing/response time
• Clarify meaning and understanding
• Minimise competing noise
• Hearing and vision aids
• Use personal references

Talk by Prof Anne-Marie Hill
Exercise practical considerations

• Supervision and safety
• Focus on strengths
• Tailored and progressive
• Instructions and communication
• Co-morbid conditions
• Current level of function/activity/fall risk
• Achievable
• Sustainable
• Enjoyment
• Environment (noise, set-up)
• Group vs individual
Summary

• Older people with dementia are at increased risk of falls and fall-related injury

• A number of modifiable risk factors have been identified
  • e.g. balance, mood and anxiety, physical activity, CNS medications

• Exercise potentially prevents falls in community-dwelling older people with dementia
  • Good quality, large RCTs needed to confirm/strengthen evidence
Summary

• Hospital
  • Multifactorial interventions for the hospital setting
  • Patient (cognitively healthy) and staff education in rehab units

• Residential care
  • Some multifactorial
  • Vitamin D

• Many other positive effects of exercise
  • Physical function, CVD, diabetes, weight control, mood, cognition

• We need more evidence/research in this population

• Until then strive for high quality, person-centred, comprehensive care
Resources

Active and Healthy (NSW Health; can search for appropriate exercise classes in local area) [http://www.activeandhealthy.nsw.gov.au/](http://www.activeandhealthy.nsw.gov.au/)


Australian and New Zealand Falls Prevention Society (ANZFPS) [http://www.anzfallsprevention.org/](http://www.anzfallsprevention.org/)


Pedro (Physiotherapy Evidence Database) [https://www.pedro.org.au/](https://www.pedro.org.au/)


Dementia Australia [https://www.dementia.org.au/](https://www.dementia.org.au/)