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Pam Albany Lecture:
Balancing acts – Gaps and opportunities for falls
prevention into the 2020's

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Where are we at in falls prevention research?

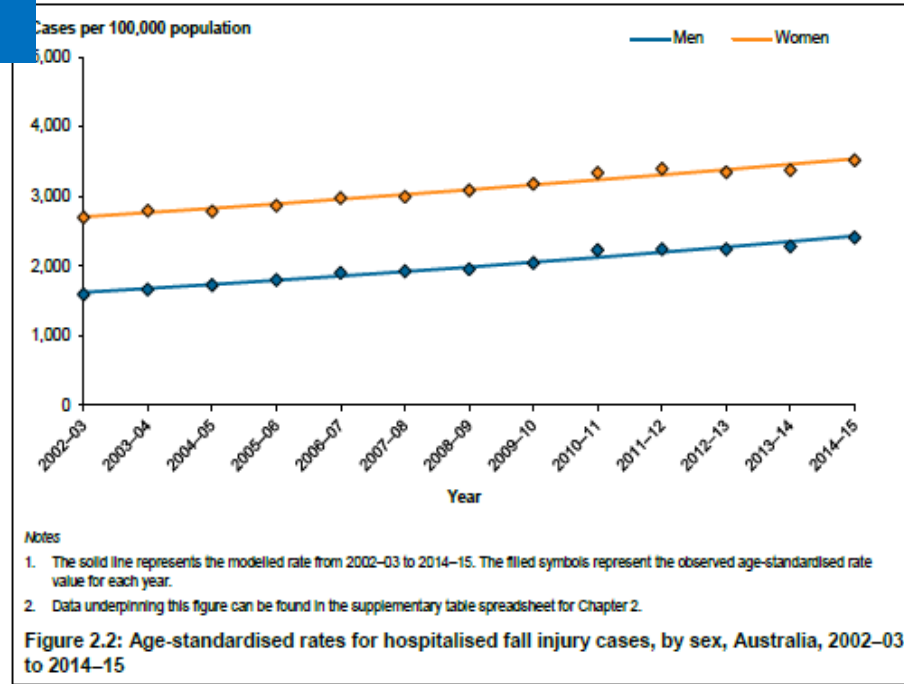
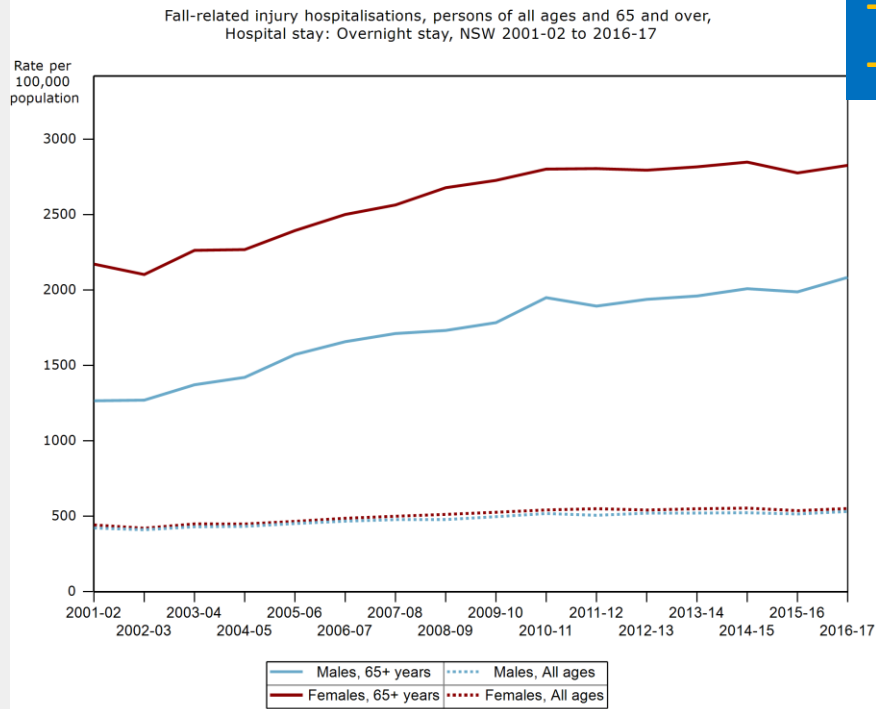


Don't we have enough falls prevention RCTs???

Do we need more trials???

Hospital admissions for falls (all settings): changes over time (NSW / Australia)

The rate of hospitalised falls for
- men increased by 3.4% per year,
- women increased by 2.3% per year



- 1 in every 10 days spent in hospital by a person aged 65 and over in 2014-15 was attributable to an injurious fall
- Days of patient care attributable to fall-related injury increased from 0.8 million patient days in 2002-03 to 1.4 million patient days in 2014-15

Falls prevention across settings and transitions



- 50% continue to fall if discharged back home from ED
- 15% of older people fall at least once within 1 year of being discharged home from hospital (if not experiencing serious illness) (Manney et al, 2000)



High risk



High risk



• Importance of settings
• Interventions not directly transferable between settings

GLOBALLY		
Setting	Research volume	Gaps
Community	+++++	++
Hospital	++	++++
Residential care	++	++++
Transitions	+	++++



RESPOND – Emergency Department presentations for falls (<72 hours)

- High falls risk group
- Low uptake of guide- line level care
- Limited effect of interventions to reduce falls
- Low level adherence
- Reduced effect for referral type interventions
- Evidence that coaching (in other clinical groups) improves adherence and outcomes

Study protocol

RESPOND—a patient-centred programme to prevent secondary falls in older people presenting to the emergency department with a fall: protocol for a multicentre randomised controlled trial

A L Barker,¹ P A Cameron,¹ K D Hill,² L Flicker,^{3,4,5} T P Haines,⁶ J A Lowthian,¹ N Waldron,⁷ G Arendts,^{3,5} J Redfern,⁸ A Forbes,⁹ C A Brand,^{1,10} C D Etherton-Bear,^{3,4,5} A M Hill,¹¹ P Hunter,¹² S R Nyman,¹³ D Smit¹²

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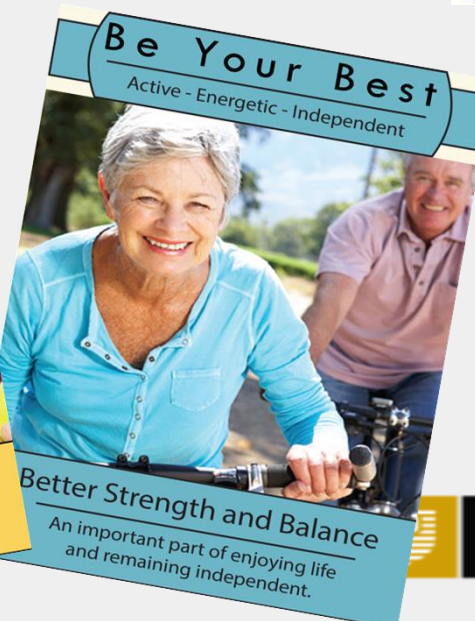
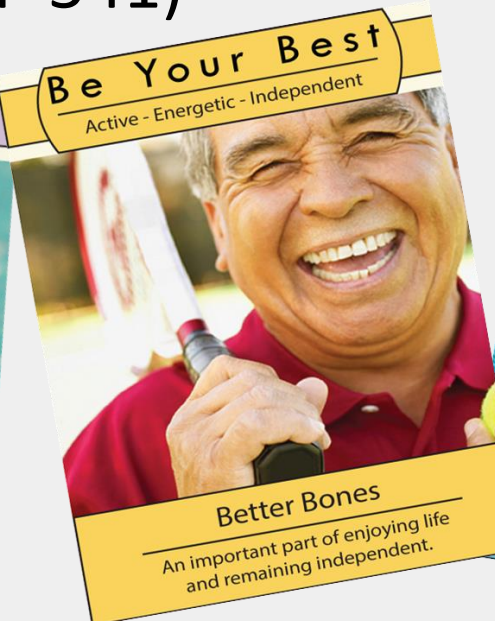
ABSTRACT
Introduction Participation in falls prevention activities by older people following presentation to the emergency department (ED) with a fall is suboptimal. This randomised controlled trial (RCT) will test the RESPOND programme, an intervention designed to improve older persons' participation in falls prevention activities through delivery of patient-centred education and behaviour change strategies.
Design and setting A RCT at two tertiary referral EDs in Melbourne and Perth, Australia.

falls in older people presenting to the ED with a fall. Eight studies have reported programmes that had no effect on new falls, fall injuries or ED presentations,⁴⁻¹¹ while three reported programmes reduced secondary falls.^{3, 12, 13} The characteristics that appear to differentiate successful programmes from others include delivery of the intervention within 1 month of the index fall and greater intensity of the interventions.¹⁴ An Australian randomised controlled trial (RCT) of older people attending the ED after a fall reported that for

▶ Significant reduction in falls and fractures

Key elements of RESPOND

- Limited suite of evidence based interventions
- Positive health messages in all program materials
- Clinicians trained in motivational interviewing to support sustained participation
- After initial visit: Phone based intervention x 6 months
- 2 sites: Melbourne and Perth (n=541)



Results to be published

Will include:

- ▶ Detailed program evaluation (Beccy Morris PhD)
- ▶ Economic evaluation

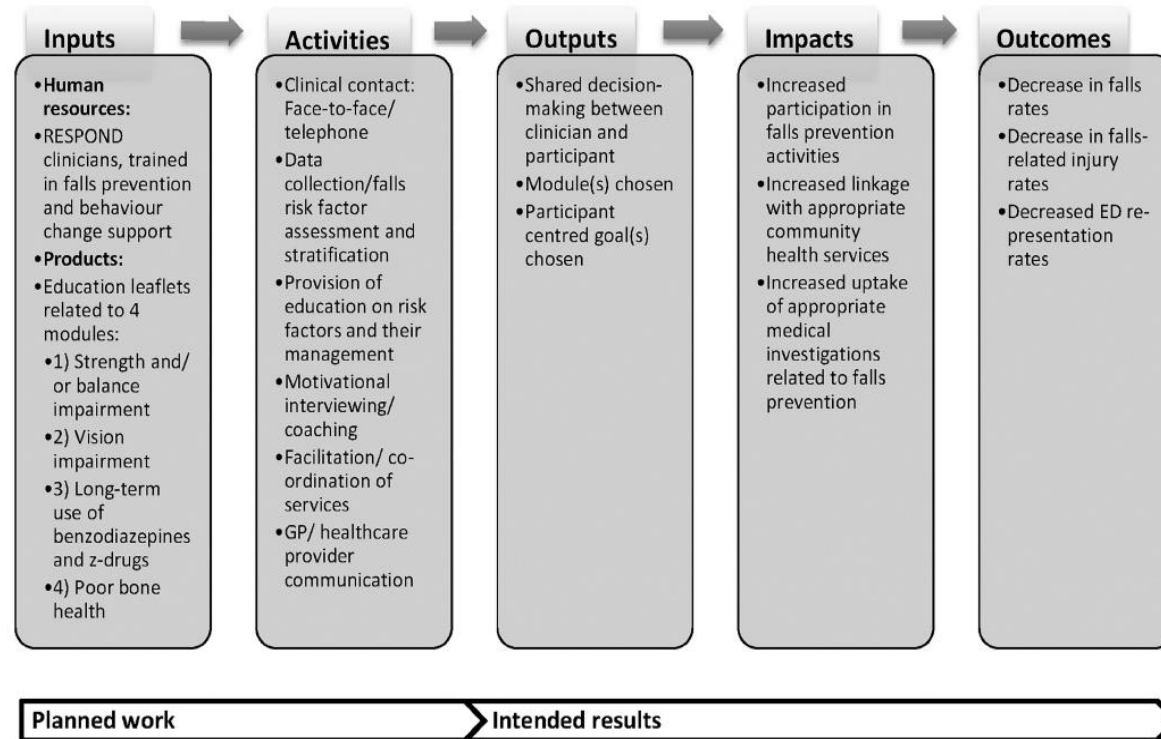


Figure 1 RESPOND programme logic model. ED, emergency department; GP, general practitioner.

Is exercise the magic pill in falls prevention?

Exercise and falls prevention: what we know...

86 RCTs (all settings, though most in **community**)

Table 4 Results of multivariable meta-regression exploring the impact of trial-level characteristics on the effect of exercise on falls in general community-dwelling older populations

Variables included in multivariable meta-regression (number of trials with this characteristic)	Effect on effect size, meta-regression coefficient (95% CI), p value	Effect on falls, IRR (95% CI), p value
<i>Inclusion of high challenge balance training* (31)</i>	<i>0.87 (0.76 to 1.00), 0.04</i>	<i>0.79 (0.71 to 0.88), <0.001</i>
<i>3+ hours per week of intervention (20)</i>	<i>0.78 (0.66 to 0.92), 0.004</i>	<i>0.70 (0.60 to 0.83), <0.001</i>
<i>Neither high challenge balance training or 3+ hours per week of intervention</i>		<i>0.90 (0.82 to 0.99), 0.03</i>
<i>High challenge balance training and 3+ hours per week of intervention</i>		<i>0.61 (0.53 to 0.72), <0.001</i>

*All three criteria: movement of the centre of mass, narrowing of the base of support and minimising upper limb support.

Note: 72% heterogeneity explained by both variables; statistically significant comparisons shown in italics.

But limited sustained participation



COMMUNITY - Exercise interventions: Don't forget the feet

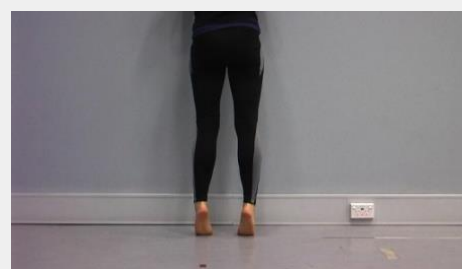
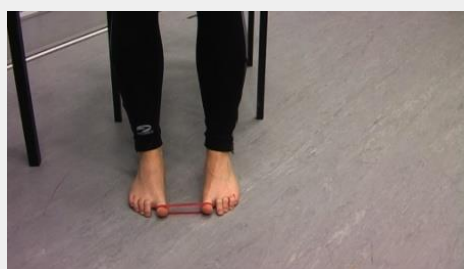
BMJ

RESEARCH

Effectiveness of a multifaceted podiatry intervention to prevent falls in community dwelling older people with disabling foot pain: randomised controlled trial

Martin J Spink, PhD candidate,^{1,2} Hylton B Menz, professor,¹ Mohammad R Fotoohabadi, research officer,¹ Elin Wee, research officer,¹ Karl B Landorf, senior lecturer,^{1,2} Keith D Hill, professor of allied health,^{1,3,4} Stephen R Lord, senior principal research fellow^{5,6}

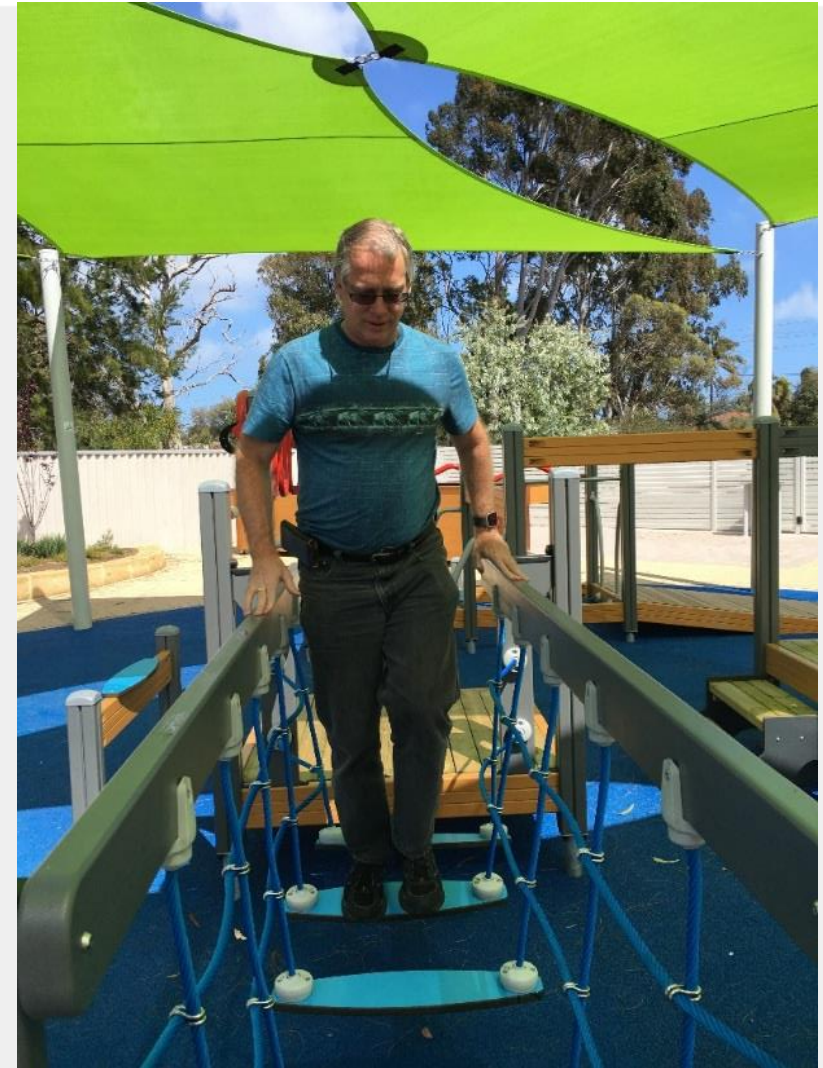
- Sample with disabling foot pain and increased falls risk
- Intervention=foot & ankle exercise, footwear subsidy, and orthoses provision
- Intervention group had 36% fewer falls, $p < 0.05$



Exercise parks for older people

- Exercise parks for older people (Finland: Lappset)
- Victoria University study (Melbourne) (18 weeks):
 - Significant balance, strength and mobility improvements
 - 87% completed program, 80% adherence
 - Well accepted, high level of enjoyment
- Growing number of councils in Australia installing Seniors Exercise Parks
- Emerging research currently being conducted
- New studies underway in Melbourne and Perth

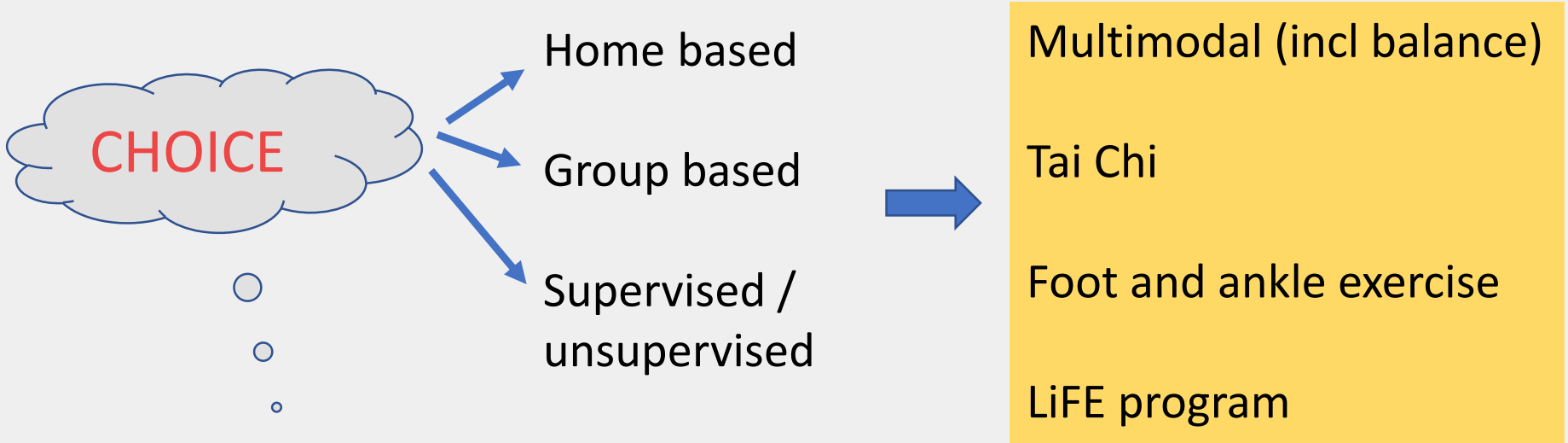
Did not evaluate falls as an outcome



http://www.lappset.com/global/en/Pro_Play/The_Elderly_.iw3

Sales M et al, BMC Geriatrics 2015, 15:68 (protocol)
Sales M et al, J Ageing & Health, IN PRESS (RCT results)
Sales M et al, Int J of Aging and Society (IN PRESS qualitative outcomes)

Exercise: Summary of evidence for preventing falls



Participation in falls prevention exercise by older Australians

- Randomly selected sample (>5,000 participants, 61% response rate)

Table 1

The past week prevalence (weighted %) and frequency of selected physical activities reported by older adults: New South Wales (Australia) Falls Prevention Survey 2009 (n = 5681).

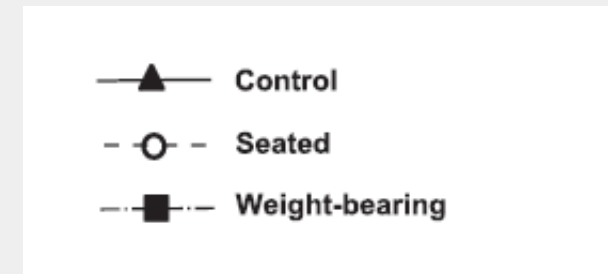
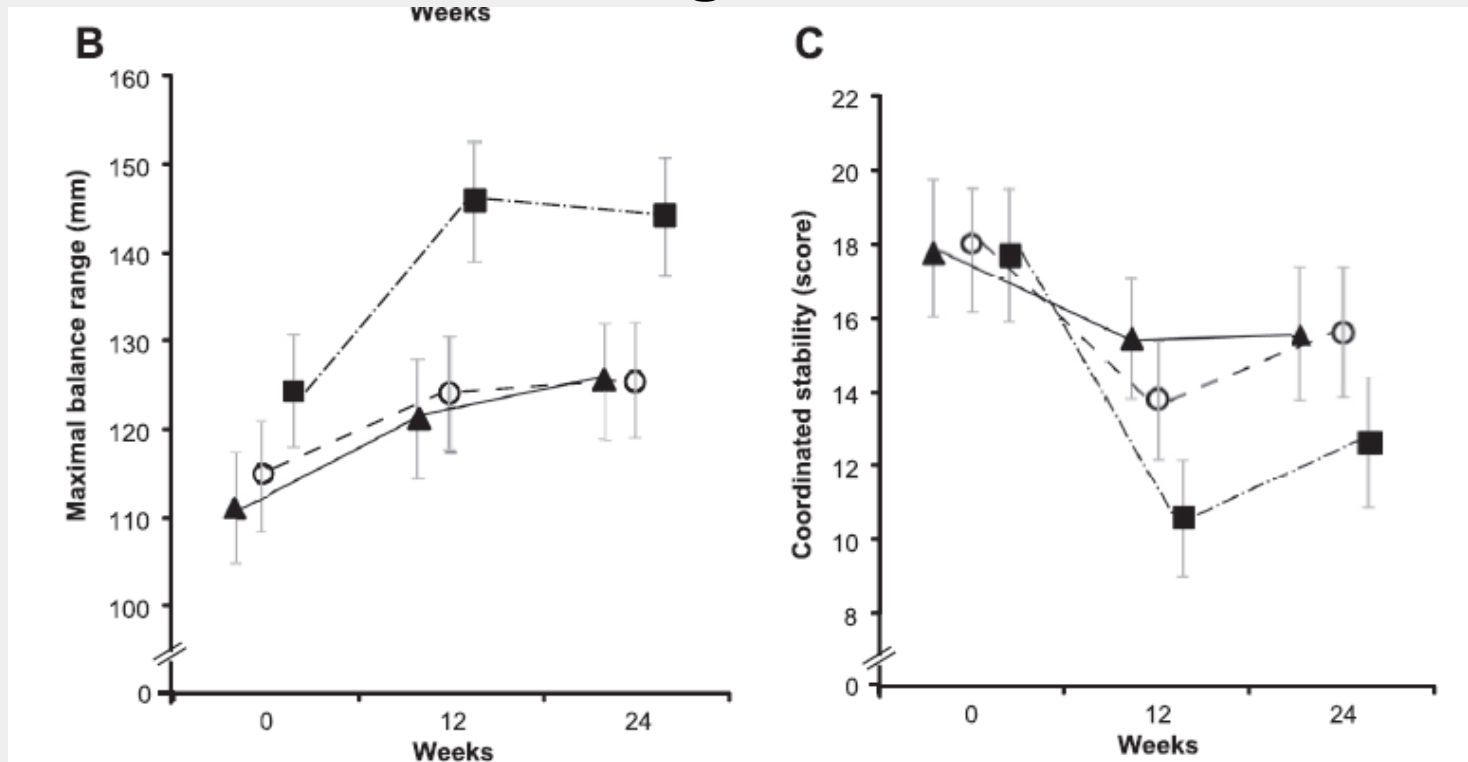
	n	Prevalence	Times/week
		% (95% CI)	Mean (95% CI)
Prompted activities			
Walking for all purposes	4579	80.8 (79.7–82.1)	5.3 (5.2–5.4)
Strength/resistance	670	12.0 (11.0–13.0)	4.3 (4.0–4.6)
Group exercise	443	7.9 (7.12–8.73)	2.7 (2.5–3.0)
Lawn bowls or other bowls	369	6.54 (5.81–7.27)	1.8 (1.7–1.9)
Balance training	331	5.95 (5.25–6.65)	3.8 (3.4–4.2)
Golf	289	5.36 (4.68–6.05)	2.0 (1.8–2.1)
Dancing	206	3.41 (2.89–3.93)	1.9 (1.6–2.1)
Tai Chi	158	2.70 (2.22–3.17)	3.0 (2.5–3.4)
Tennis	126	2.40 (1.91–2.88)	1.4 (1.2–1.6)
Yoga	101	1.79 (1.40–2.18)	3.2 (2.7–3.7)
Team Sports	50	1.03 (0.70–1.36)	1.5 (1.1–1.8)
Participation in balance strength,			
		Participated at any level	≥ 2 episodes/week
	n	% (95% CI)	% (95% CI)
Balance-challenging ^a	691	12.2 (11.2–13.1)	7.9 (7.1–8.8)
Balance-challenging ^b	1220	21.8 (25.5–23.0)	14.6 (13.6–15.7)
Strength	670	12.0 (11.0–13.0)	9.4 (8.6–10.3)
Balance-challenging ^a or Strength	1137	20.0 (18.8–21.2)	15.0 (13.9–16.4)
Balance-challenging ^b or Strength	1603	28.4 (27.1–29.8)	21.0 (19.8–22.2)
Balance-challenging ^a and Strength	224	4.1 (3.5–4.7)	2.4 (1.9–2.9)
Balance-challenging ^b and Strength	287	5.3 (4.7–6.0)	3.0 (2.5–3.6)

^a Balance-challenging is strictly defined: tai chi, balance training, dance, some team sport.

^b Balance-challenging is broadly defined: tai chi, balance training, dance, all team sport, golf, bowls.

Evidence of detraining when an exercise program is stopped

- 12 week weight bearing (home based) exercise program (3 times / week) vs seated resistance exercise vs social visit
- Loss of up to 50% of balance gains in the subsequent 12 weeks after ceasing exercise

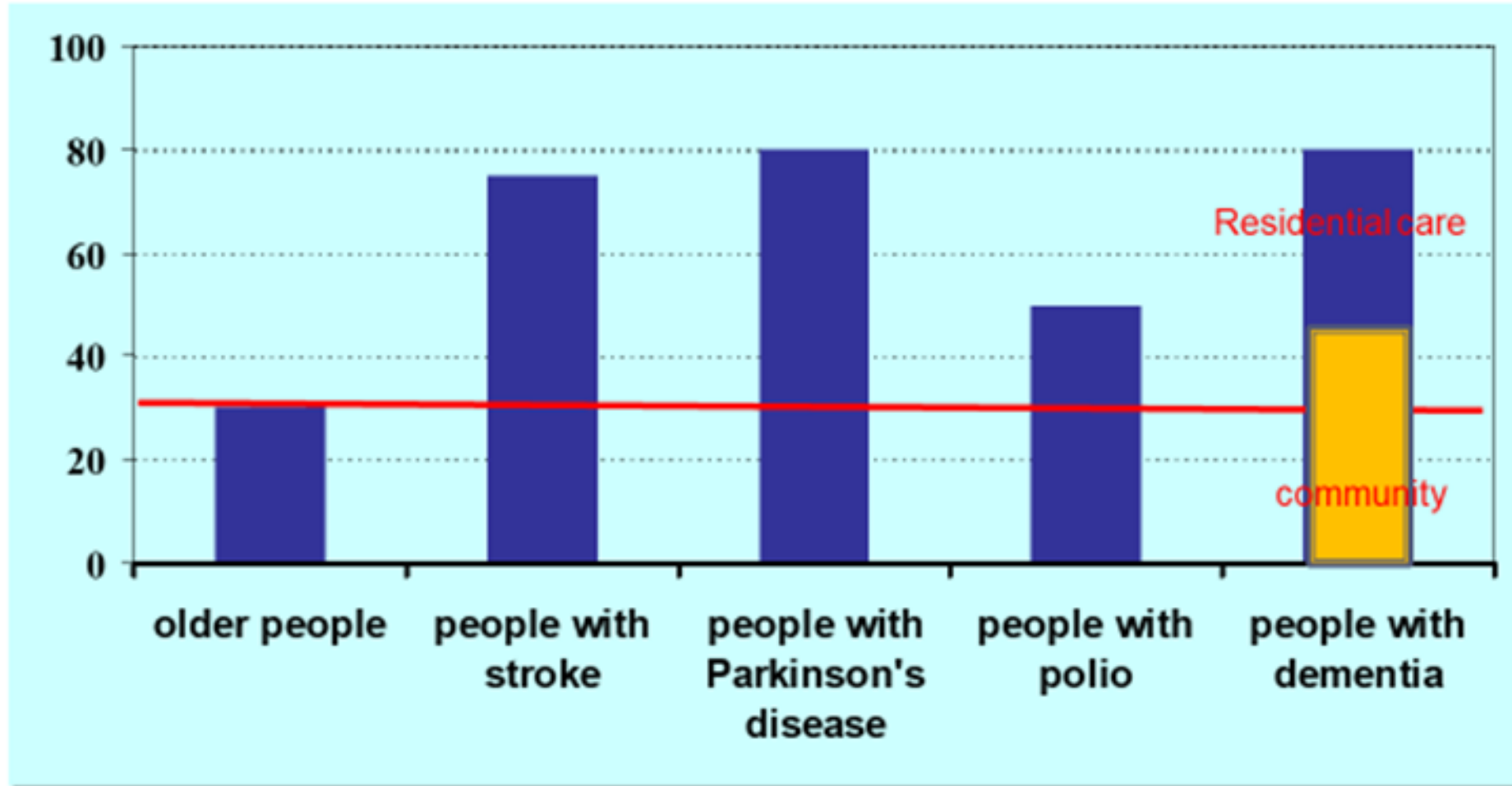


Strategies to address limited uptake and sustained participation

- Improve older person's knowledge and awareness
- Strategies to improve personalising of risk
- Availability of options and choice
- Variability of practice
- Involvement of significant others (family, doctor)
- Identify and minimise barriers
- Well trained staff with behaviour change experience
- Persistence
- Need for tailoring with some clinical populations:
 - Dementia
 - Lower limb arthritis
 - Stroke



Falls in clinical groups



Lord et al, 1993; Forster & Young, 1995; Hill, 1998; Hill & Stinson, 2004; Allan et al. 2009 (AD)

Can we just apply what works for older people generally...

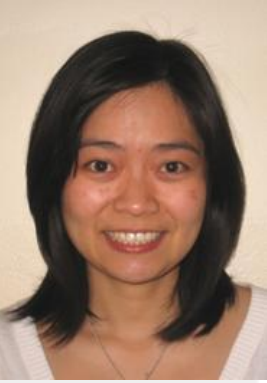


When a successful method in cognitively intact older people was applied to cognitively impaired older people...

- (Close et al 1999) – **cognitively intact** older people presenting to Emergency Dept after a fall, had geriatrician and OT assessment then referral to appropriate interventions ✓
- (Shaw et al, 2003) – similar approach to Close et al – but for **cognitively impaired** older people presenting to Emergency Department after a fall ✗



Modifications for home exercise intervention for people living with Alzheimer's disease



Dr Plaiwan Suttanon,
Thammasat Uni,
Thailand

Otago Exercise Program

- Self managed
- 4 home visits by physio over 6 months
- Standard exercises
- Standard instructions
- Intermittent phone call followup

Suttanon et al, 2013

- Carer involvement
- Increased physio home visits (esp initially)
- Potentially simplified exercises initially
- Simplified instructions and increased repetition and cues
- Increased phone call followup
- Monitor carer burden



Study outcomes

- Sample (n=40), mild to moderate severity dementia, living at home (most with a carer)
- Average age 81 years
- Randomised trial:
 - intervention = home exercise program (modified from Otago), carer supervision, intermittent physio visits
 - Control = home visits (OT, education focussed)
- After 6 months:
 - 11/19 in the exercise group completed the program (83% adherence for those completing the program)
 - No injuries / adverse events
 - Home exercise group achieved significant improvement in falls risk and balance
 - No significant difference between groups for carer burden



Systematic review and meta-analysis: Exercise vs usual care for fallers versus non-fallers – participants with dementia

- 7 randomised trials, **781 participants**
- 4 studies had samples of solely older people with cognitive impairment; subgroup data on persons with cognitive impairment were obtained from the other 3 trials
- Meta-analysis results: significant effect in preventing falls - pooled estimate of rate ratio of 0.68 (95% confidence interval 0.51-0.91).



Interventions for preventing falls in older people in care facilities and hospitals (Review)

Cameron ID, Dyer SM, Panagoda CE, Murray GR, Hill KD, Cumming RG, Kerse N

Cameron ID, Dyer SM, Panagoda CE, Murray GR, Hill KD, Cumming RG, Kerse N.
Interventions for preventing falls in older people in care facilities and hospitals.
Cochrane Database of Systematic Reviews 2018, Issue 9. Art. No.: CD005465.
DOI: 10.1002/14651858.CD005465.pub4.

www.cochranelibrary.com

A gap: Residential care

- Update on 2012 Cochrane review
- Reports Residential care and Hospitals (latter not included in presentation)
- Since 2012 in residential care:
 - 28 new randomised controlled trials (a)
- In total, 71 studies in residential care:
 - 54 trials tested the effect of a single intervention only
 - three trials tested multiple interventions
 - one trial tested a single intervention only, and 13 trials tested a multifactorial intervention only

2018: Quality of the evidence
“The majority of trials were at high risk of bias, mostly relating to lack of blinding. With few exceptions, the quality of evidence for individual interventions in either setting was generally rated as low or very low.”

Exercise interventions in residential care: **rate of falls**

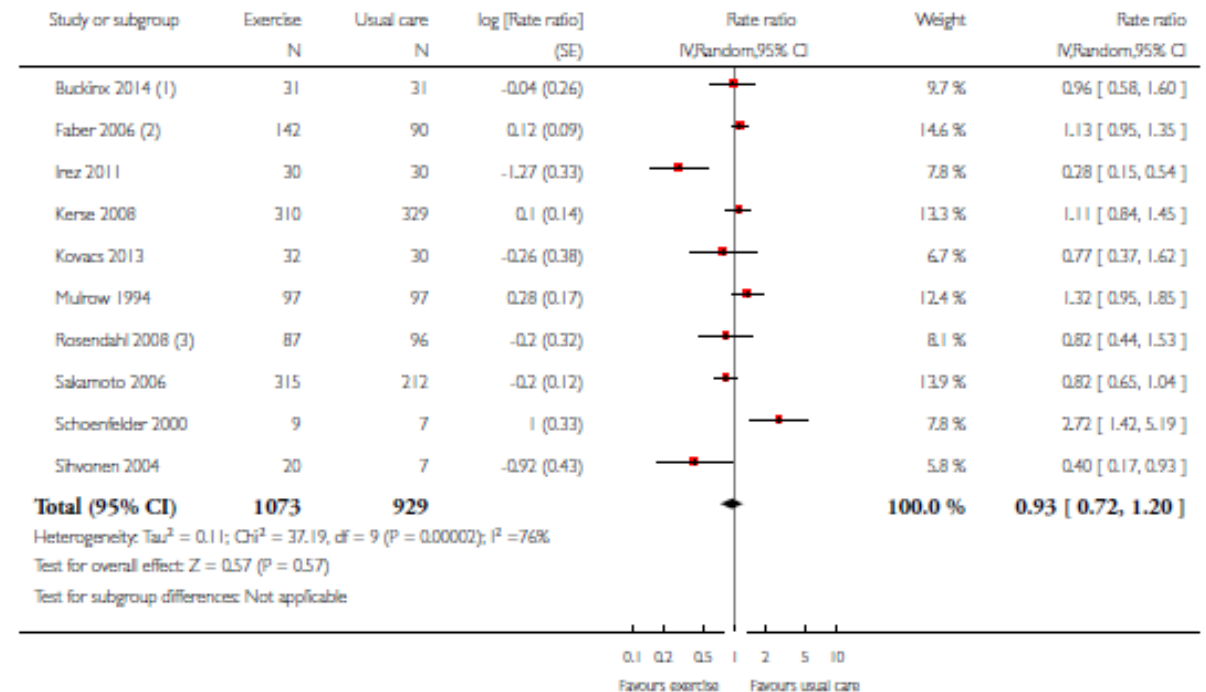
- Overall **no effect** RR=0.93 (0.72-1.20)
- Average intervention sample size: 107.3; without 2 large studies, ave=61
- Diverse mix of interventions and sample profile
- ??small effect when some similar interventions grouped
- Similar outcome for number of fallers

Analysis 1.1. Comparison 1 Care facilities: Exercise vs usual care, Outcome 1 Rate of falls.

Review: Interventions for preventing falls in older people in care facilities and hospitals

Comparison: 1 Care facilities: Exercise vs usual care

Outcome: 1 Rate of falls



(1) 12 months follow-up

(2) Functional Walking (FW) and In Balance groups (IB) combined vs control

(3) Functional exercise programme vs seated activities



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Progressive Resistance and Balance Training for Falls Prevention in Long-Term Residential Aged Care: A Cluster Randomized Trial of the Sunbeam Program

(Australian study)

- ▶ New trial results (post Cochrane review)
- ▶ See later presentation



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In summary

- High risk population
- Limited evidence of effective interventions
 - Vitamin D supplementation for residents with low vitamin D
 - Multifactorial interventions (sub analysis by level of care)
 - ??some exercise interventions
- Low quality / small sample sizes
- Limited focus of new research

The last frontier (in falls prevention): Hospital settings

Most challenging setting due to:

- short length of stay
 - need for EARLY identification
 - many falls occur in first few days of admission
- staff variability
 - need for effective communication
 - regular vs agency staff
- patient status changes
- complex mix of
- Unfamiliar
- Poor en
- Well entre
- In some case and limited knowledge of falls prevention by staff

26 patient deaths, 530 hip fractures and about 1000 other fractures occurred in UK hospitals in 12 months
2018 Cochrane review:



A possible solution - Ambient Intelligence Geriatric Management system (AmbIGeM)

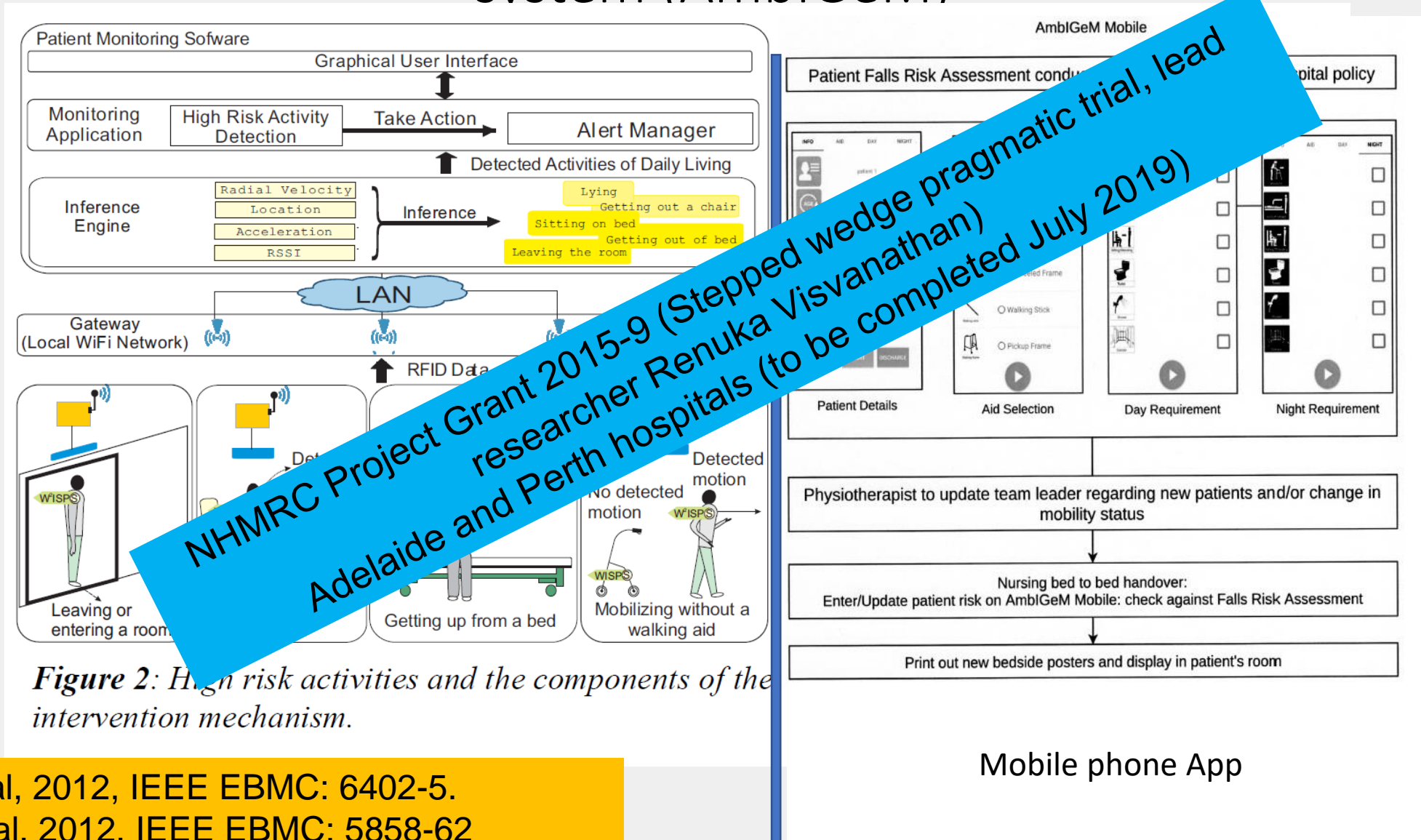


Figure 2: High risk activities and the components of the intervention mechanism.

Bed moves in hospitals

- ▶ Acute hospital in Perth
- ▶ Median of 2 bed moves (including move from ED), maximum 8 bed moves
- ▶ Bed moves occurred throughout the day and night
- ▶ Non-fallers on average 1.91 bed moves / patient (median 2); Fallers (n=24) on average 3.41 bed moves / patient (median 3)
- ▶ Number of bed moves was significantly associated with risk of falling (generalised linear mixed effects model, after adjustment for length of stay) – OR 1.56 (1.11, 2.18), $p < 0.01$



Bed moves study conclusions

- Bed moves are common for older high falls risk patients admitted to hospital
- Association between increased bed moves and falls
- Need for consideration before bed moves are made for high falls risk patients:
 - Is the bed move essential?
 - Are there other patients with lower falls risk who could be moved instead (why this patient)?
 - If a bed move is essential, staff need to adopt higher vigilance and be aware of the likely increased risk of falls

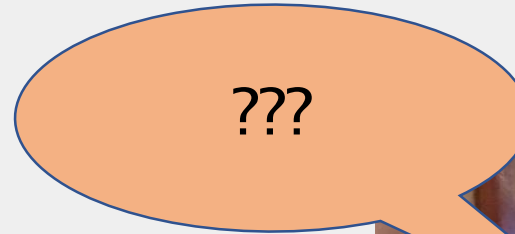


What to do when the evidence is not available?

- Differentiate lack of evidence with evidence of no effect
- Consider size and quality of trials
- Consider other types of evidence that may provide at least some guidance for practice (non-randomised trials, program evaluation, qualitative trials)
- Draw on evidence from other settings (but consider setting specific factors)
- Best practice guidelines
- ??other



Ageing baby boomers (1946-64) – will they be different?



- Reluctant to see Dr
- Does not seek additional advice (2nd opinion, internet...)
- Generally low level of focus on preventive health



Possible impact of baby boomer generation (born 1946-1964)

In 2011, first Baby Boomers turned 65

Positives

- ▶ Education
- ▶ Health literacy
- ▶ Tech savvy
- ▶ Affluent
- ▶ Questioning (second opinion / research)
- ▶ Benefit from health promotion messages in past 20 years
- ▶ Strong desire for independence

but not universal

Need to consider implications for all interventions, including falls prevention

ability to adapt to rapidly changing technology

- ??reluctance to change behaviours



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Possible changes in service delivery with Baby Boomers

- Greater use of
 - internet for education
 - telehealth (especially for outside of major cities)
 - Apps to support improved exercise participation
 - Apps for monitoring key health parameters “on-line”
 - ...others



Summary

- ▶ Strong ongoing growth in research outcome studies (primarily community setting)
- ▶ Need for greater research focus on residential care and hospital settings, and transitions, and some high risk clinical groups (tailoring of interventions)
- ▶ Need for focus on translational studies
 - Randomised trial design to ensure design that can be translated
 - Use of program evaluation to inform successful (and unsuccessful) elements of successful interventions
 - Translational research / funded translational programs of successful interventions
- ▶ Strong engagement of clinicians / end users in research design / co-design
- ▶ Consider generational changes in recommending interventions



A Falls Management
Conference for Health
Workers, Managers,
Educators and Carers



3rd GrassRoots Falls Festival



19 & 20 September 2019
Fremantle Esplanade
Western Australia

**PEOPLE, PARTNERS
& PURPOSE:
2020 & BEYOND**

Key Dates

- Dec 2018** – Early Bird Registration Opens
- Jan 2019** – Abstract Submissions Open
- Mar 2019** – Abstract Submissions Close
- Apr 2019** – Abstract Outcomes
- Jul 2019** – Early Bird Registration Closes / Standard Opens
- Sept 2019** - Conference



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IMPORTANT DATES

Call for Abstracts/ Submitted Symposium Opens	2018/11/30
Deadline for Abstract Submission/ Submitted Symposium	2019/03/01
Early bird registration and Accommodations Open	2019/03/01
Deadline of Full Paper Submission for SPECIAL ISSUE	2019/04/01
Notifications of Abstract Decisions	2019/05/01
Early Bird Registration Deadline	2019/06/15
Regular Registration Deadline	2019/09/23
The 11st IAGG Asia Oceania Congress of Gerontology and Geriatrics	2019/10/23-27

KEYNOTE SPEAKERS



Keynote Lecture
Clinical Science
Prof. Haruo Hanyu,
Japan



Keynote Lecture
Gerontechnology
Pro. Dr.-Ing. Univ.
Tokio Thomas Bock,
Germany



Keynote Lecture
**Behavioural and
Social Sciences**
Prof. Julie Byles,
Australia



Keynote Lecture
Biological Science
Prof. Luigi Fontana,
USA



Keynote Lecture
**Policy, Planning
and Practice**
Prof. John Rowe,
USA

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