



**Reducing harm from falls:
Recent literature of interest
(February 2019–February 2020)**

*Extract from:
Reducing harm from falls:
Recommended evidence-based resources 2020*

April 2020

Summary of 2019–20 evidence on falls

- The National Institute for Health and Care Excellence (NICE) conducted surveillance of the evidence on reducing harm from falls. It found that **evidence continues to support strength and balance exercises** (now clearly effective even beyond 12 months) and other exercises with strength and balance components. Other interventions the evidence supports are **home safety assessment and modifications**, and **vitamin D in the aged residential care setting**.
- The NICE surveillance of the evidence calls into question whether medicines review or multifactorial interventions tailored to the individual's risk assessment (as opposed to multicomponent interventions offered to everyone) are effective in preventing falls. However, reasons remain for continuing to implement these interventions (see below).
- Social isolation and loneliness, as well as malnourishment are associated with falls.
- Orthostatic hypotension occurs in one in four older people in aged care facilities and one in five in the community. These findings add to the evidence that supports measuring and documenting lying and standing blood pressure as a falls risk factor.
- An Australian survey revealed poor knowledge of care among staff: only one-quarter of staff (26.5 percent) were aware that residents were at high risk for falls.
- In aged residential care, strength and balance exercises, staff education about medication, falls and fall prevention guidelines, and vitamin D all appear to be effective.
- Only 30 percent of hip fracture patients in New Zealand are assessed by a geriatrician before surgery, even though shared orthogeriatric care, and specifically an orthogeriatric ward model of care, improve outcomes.

New falls evidence surveillance (NICE 2019)

The UK's National Institute for Health and Care Excellence conducted a surveillance review of the evidence supporting its guidelines of falls and published its findings in 2019. Through its surveillance, NICE found the following, which might materially impact on recommendations ([NICE 2019](#)).

- Topic experts indicated a need to include frailty and previous fragility fractures as individual risk factors for falling.
- Evidence on multifactorial interventions is inconsistent but showed no effect of increasing falls any more than it showed a reduction in falls. (When interventions are classified as multifactorial or multiple component, multiple component interventions

[offered to everyone] appear to be effective whereas multifactorial interventions [adapting interventions to the person's risk] do not.)

- Strength and balance exercises are effective, but an update is needed to consider whether to recommend other types of exercise (eg, Tai Chi) as well. Evidence addressed both people living in the community and people living in residential care.
- Home hazard modification or occupational health assessments reduce falls.
- Evidence did not support medicines interventions, including reducing psychotropic and cardiovascular medicines for reducing falls. However, medicines optimisation has wider benefits and should continue.
- Evidence on podiatry interventions was inconsistent. However, case management, self-care interventions and telehealth interventions may reduce falls.
- Evidence in the hospital setting suggests that bed and bedside chair sensors, bed alarms and multifactorial interventions may not reduce falls. Physiotherapy showed inconsistent results depending on the measure of falls, and NICE found no evidence on bedrails. Preventing delirium may help reduce falls.

We emphasise that these were the findings of the evidence surveillance report and not yet NICE recommendations for clinical practice.

Falls in New Zealand

We update the New Zealand [falls and fractures outcome framework dashboard](#) every quarter. The dashboard provides data on the number of fall injuries, serious harm falls, length of hospital stay, bisphosphonate treatment, and consumers enrolled in community or home-based prevention programmes both nationally and by district health board. Users can access the dashboard to **see how the nation and various district health boards are tracking** on key measures of falls harm reduction.

Consumers, carers, families and whānau

Falls are linked to social isolation and loneliness. A systematic review of 17 studies revealed that in all studies loneliness, social isolation and living alone were significantly associated with falls in older people ([Petersen et al 2020](#)). This association is important because it highlights additional social factors to consider in those who have fallen, and also the need to discuss falls prevention with those who may be lonely or socially isolated.

The impact of falls

Intracranial bleeding is common after a ground-level fall. A systematic review of older people presenting to an emergency department after a ground-level fall found the incidence of intracranial bleeding is about 5 percent ([de Wit et al 2020](#)). This finding emphasises the very serious consequences of falling and the importance of prevention. Health professionals should explain these possible consequences to older people and their whānau when discussing why falls prevention is important.

Identifying older people at risk of falling

Older adults who are malnourished have an increased risk of falling. A systematic review and meta-analysis of 9,510 older adults found that people who were malnourished or those at risk for malnutrition had a 45 percent higher risk of experiencing at least one fall than those who were well-nourished ([Trevisan et al 2019](#)). However, a recent prospective analysis of 2,464 men and women aged over 60 years suggests that increased protein intake alone does not protect against falls risk ([Sandoval-Insausti et al 2019](#)).

Orthostatic hypotension is a common falls risk factor and should be tested for. A systematic review and meta-analysis of 24,967 older people living at home and 2,694 living in care facilities found that the prevalence of postural blood pressure drop was 22 percent in the community and 24 percent in residential facilities ([Saedon et al 2020](#)). Health professionals should record blood pressure both lying and standing and document it in the notes.

Keeping active remains crucial

The evidence supporting exercise (including strength and balance training as well as Tai Chi) remains strong.

A systematic review considered 108 randomised controlled trials of exercise as a single intervention to prevent falls in adults aged 60+ years who were living in the community. It found that trials of the following interventions were successful in reducing falls ([Ng et al 2019](#)):

- balance and functional training interventions lasting on average 25 weeks, group based or individually tailored
- Tai Chi interventions lasting on average 20 weeks, mostly group based
- programmes with many different types of exercise lasting on average 26 weeks, group based or individually tailored.

Exercise programmes are effective in the long term. Systematic review and meta-analysis have shown that programmes for falls prevention are effective in reducing both the rate and risk of falls by about 20 percent for more than 12 months. However, the effect did not continue beyond two years after the intervention ([Finnegan et al 2019a](#)).

Factors enabling older people to continue with exercise depend on the individual.

Older people differ in their meaningful rationale for exercising. Influences on their decision to continue or not are identity, health, social interaction and type of exercise. To empower an older person to continue these effective falls prevention measures, health professionals should get to know the rationale and offer evidence-based practice and support for the older person to move from a structured intervention towards longer-term exercise-related behaviour. Health professionals should attempt to identify the motivators and deterrents of each individual during the intervention phase. They can then try behavioural change strategies, alongside educational elements in the programmes, so that participants can incorporate exercise into everyday life ([Finnegan et al 2019b](#)).

Important influences on whether older people with cognitive impairment continue with falls prevention exercises, as one study found through semi-structured interviews, were: routine; practical and emotional support; memory support; purpose; past experiences of sport and exercise; and belief in and experience of benefits. Health professionals should understand that identifiable cognitive, psychological and practical factors influence whether those with cognitive impairment persist with exercise and should address these so that interventions can succeed ([Hancox et al 2019](#)).

Interventions in the community

The role of multifactorial interventions may not be as important as previously thought. A systematic review and meta-analysis published in August 2019 examined 41 trials and over 20,000 participants to identify the effect of multifactorial interventions in the community setting. Results showed that multifactorial interventions may reduce the rate at which people fall by 21 percent, but that evidence for reducing the risk of falling or the impact of falls was slight. The authors concluded that:

while multifactorial interventions may reduce the rate of falls and slightly reduce risk of people sustaining one or more falls and recurrent falls, they may make little or no difference to other fall-related outcomes (such as fall-related fractures, falls requiring hospital admission or medical attention, health-related quality of life) ([Hopewell et al 2019](#)).

This conclusion suggests that researchers should examine the cost-effectiveness of multifactorial interventions in the community in further detail.

Furthermore, a systematic review and meta-analysis of randomised controlled trials, published in December 2019, found insufficient evidence to support the use of multifactorial interventions to prevent falls or hospital use in older people presenting to the emergency department following a fall ([Morello et al 2019](#)).

However, it is also important to note that the ‘usual care’ many studies use to compare with an intervention may still be effective care, including many obvious interventions to prevent falls. As we learn more about preventing falls and apply it in usual practice, intervention studies may find a more limited effect for the intervention. Moreover, many falls in aged residential care are associated with terminal decline and may be difficult to prevent, without simply keeping the older person in bed. These different kinds of falls might also dilute the effect of interventions. The key point remains that health professionals should assess an older person’s risk factors for falling and then choose and tailor interventions based on their individual circumstances.

Interventions in aged residential care

A systematic review and meta-analysis published in 2019 looked at the efficacy of interventions to prevent falls in nursing homes and whether they were generalisable to residents with cognitive impairment and dementia. From 36 studies, the authors found evidence that falls prevention interventions overall reduced the number of falls by 27 percent. **Strength and balance exercise** in particular, as a single intervention, reduced the number of fallers by 36 percent and recurrent fallers by 41 percent among residents in aged care. **Staff education** about medication, falls and fall prevention guidelines was

effective. **Vitamin D supplementation** was also effective (see below). Some multiple and multifactorial interventions appeared to be effective, which may include some combination of exercise, environmental modifications, medication review, medical assessment, optometry review and podiatry review ([Gulka et al 2019](#)).

Vitamin D is appropriate for residents in long-term facilities to prevent falls. The debate about the role of vitamin D in falls prevention appears to have concluded. A review by the Canadian Agency for Drugs and Technologies in Health (CADTH) found moderate-quality evidence to suggest that vitamin D supplementation may reduce the rate of falls (ie, number of falls), but not the risk of falling (ie, number of individuals who fall) in older adults residing in long-term care facilities. CADTH also concluded that economic evaluations show vitamin D supplementation is less costly and more effective than no intervention in preventing falls and fall-related injuries. However, health professionals should avoid giving high daily doses (> 4,000 IU daily) or high-load doses of vitamin D because they may increase fall rates ([CADTH 2019](#)).

Medication optimisation

Most of the evidence for the impact of medication optimisation on falls has been equivocal. However, some recent evidence now indicates **successful approaches have occurred in the residential care setting**.

In New Zealand, a feasibility study at three aged residential care facilities trialled pharmacist-led deprescribing of anticholinergic and sedative medicines. The pharmacist used peer-reviewed deprescribing guidelines to recommend targeted deprescribing of anticholinergic and sedative medicines to general practitioners (GPs). GPs actioned 72 percent of deprescribing interventions that the pharmacist recommended. The authors concluded that after six months, significant benefits occurred across a range of important health measures including mood, frailty, falls and reduced adverse reactions ([Ailabouni et al 2019](#)). However, whether these findings are generalisable will depend on the rapport and relationship between pharmacists and GPs in different contexts.

Support for this local study comes from findings of a systematic review of pharmacist services in nursing homes. The review of 52 studies (13 randomised controlled trials) found that pharmacist-led services that included medication review and/or staff education reduced the mean number of falls among residents, although results were mixed for health outcomes ([Lee et al 2019](#)).

A separate systematic review and meta-analysis looked specifically at health outcomes of deprescribing interventions in nursing homes. Across 41 studies (n = 18,408 residents), deprescribing interventions significantly reduced the number of residents with potentially inappropriate medications by 59 percent (odds ratio [OR] 0.41, 95% confidence interval [CI] 0.19–0.89). Subgroup analysis showed that medication review-directed deprescribing interventions reduced all-cause mortality by 26 percent (OR 0.74, 95% CI 0.65–0.84), and the number of fallers by 24 percent (OR 0.76, 95% CI 0.62–0.93) ([Kua et al 2019](#)).

Considerations for organisations

A number of successful interventions for reducing harm from falls have included some component of staff education. A cross-sectional survey at eight aged residential care facilities assessed the knowledge of 147 facility care staff in Australia in 2015. The questionnaire examined staff knowledge, confidence, motivation and opportunity to undertake falls prevention strategies. Strikingly, only one-quarter of staff (26.5 percent) were aware that residents were at high risk for falls. Only 13.5 percent observed residents for side effects of medicines. When asked about their preferences for education delivery, respondents preferred one-on-one, face-to-face education in the workplace, and reminder posters ([Francis-Coad et al 2019](#)).

Studies have shown shared care between orthopaedics and geriatric medicine reduces mortality after hip fracture. A systematic review and meta-analysis aimed to determine which model of care is optimal. The review found that across 18 studies the mortality after hip fracture was 18 percent but that elderly patients with hip fracture had reduced long-term mortality when they were admitted early into any sort of orthogeriatric models or more specifically to a dedicated orthogeriatric ward ([Moyet et al 2019](#)).

Implementing what works

In some cases, we are not yet implementing simple measures that guidelines recommend. For example, the Australian and New Zealand Hip Fracture Registry (ANZHFR) *Annual Report 2019* notes the following statistics ([ANZHFR 2019](#)).

- Only 29 percent of facilities had a shared care model between orthopaedics and geriatric medicine.
- Only 30 percent of hip fracture patients in New Zealand were **assessed by a geriatrician before surgery** (up from 24 percent in 2018) – yet orthogeriatrician care improves outcomes for hip fracture patients.
- Among hip fracture patients in New Zealand, 55 percent had no pre-operative medical assessment.
- Only 35 percent of hip fracture patients in New Zealand had **an assessment of cognitive function** before surgery (up from 20 percent in 2018).
- Only 22 percent of hospitals routinely provided individualised written information to patients on preventing future falls and fractures.

Although these numbers appear to be trending in the right direction, more can be done. The Hip Fracture Clinical Care Standard, which the Health Quality & Safety Commission has endorsed, includes seven quality statements. For hip fracture patients, it also recommends assessment of cognition before surgery, an orthogeriatric model of care, and bone health assessment and management.

Cost-effectiveness

Recent cost-effectiveness analyses suggest that exercise interventions are cost-effective for falls prevention. Examples of these interventions are:

- a tailored exercise programme for older people that included strengthening of lower extremities, balance training, cardiovascular exercise, stretching and functional training of moderate intensity performed twice per week. Each session lasted for 60 minutes in groups of three to eight participants, who continued in the programme for at least six months. The programme also involved home-based follow-up ([Winser et al 2020](#))
- the SUNBEAM strength and balance exercise programme, which halved the number of injurious falls in a randomised controlled trial across 16 care facilities, at a cost of \$18 per fall prevented ([Hewitt et al 2019](#)).

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