TOPIC 5

Health Quality & Safety Commission New Zealand
Kupu Taurangi Hauora o Aotearoa

Safe environment and safe care are essential to prevent falls

How you can use **Topic 5**

Use Topic 5 as:

- an information resource that explains the evidence and rationale for assessing for and acting upon environmental risk factors for falls in older people
- a 60-minute professional development exercise (see 60 minutes of professional development in this resource).

LIVE STRONGER FOR LONGER
PREVENT FALLS & FRACTURES

newzealand.govt.nz

June 2020, v1

Key messages in **Topic 5**

- Assessment of the older person's environment is a key component of multifactorial risk assessment. We must act upon identified environmental risks.
- Environmental safety assessment and modification programmes are successful in reducing falls in (1) older people living in the community; and (2) older people in aged residential care and hospital care.
- Everyone involved in caring for an older person can play a role in assessing that person's environment and helping make it as safe as possible.
- The evidence base can guide us to interventions proven to reduce the risk of falls due to environmental factors.
- We must be particularly aware of high-risk situations such as when the older person is mobile, getting out of bed or toileting, and plan to minimise risks and increase safety.

What **Topic 5** covers

We've seen in Topic 2 and Topic 3 that multifactorial risk assessment should cover environmental factors, whether the older person is living in a residential care setting, at home, or is in hospital. Topic 5 explains the actions you can take to improve the safety of the environment for older people who risk falling.

We'll see that environmental safety assessment and modification programmes are successful in reducing falls by older people living in the community who are at risk of falling.

In hospital and residential care settings, our duty of care requires us to do everything possible to ensure the physical environment is safe. How we organise our work contributes to the people in our care 'feeling safe' and being confident we are 'there for them'.

Equally, we are all responsible for promoting awareness of hazards and ensuring safety in the environment when we work with an older person at their home or when they're out and about.

Topic 5 has two required readings. We suggest you start with **patients' perspectives of falling in hospital** (Carroll et al 2010) – a short, qualitative study. The second required reading covers recommendations for environmental safety relevant to your setting, and is linked to one of the 10 questions on the last page of this resource.

Improving the safety of everyone who might fall

Falls often happen because of interactions between predisposing, person-specific risk factors and an identified hazard in the physical environment (Miake-Lye et al 2013). For older people in hospital or residential care, what we do (or don't do), and the way we organise our work, adds complexity to this interaction (Healey and Darowski 2012).

In terms of person-specific factors, an **individualised approach** is effective in reducing fall rates in hospitals. This approach involves assessment by risk factors and **multifactorial interventions** that focus on the risk factors identified (Miake-Lye et al 2013; Oliver et al 2010).

In terms of an identified hazard in the physical environment, assessing environmental safety and modifying environmental risks reduces the number of people living in the community who are at higher risk of falling, from actually falling (Gillespie et al 2012).

IMPROVING THE SAFETY OF EVERYONE WHO MIGHT FALL *Continued*

But in hospital or residential care, **any** patient or resident can trip on hazards in the environment, or fall because they've tried to mobilise in a cluttered environment without help from staff. We can't insist that a person stays still in case they fall, nor override their needs for dignity and privacy (Healey and Darowski 2012). However, universally applied components related to making the environment and care safer for everyone – regardless of each person's particular risks of falling – are common to successful programmes (Miake-Lye et al 2013). ◆

How to create a safe environment

Staff actions are needed to make even a well-designed environment more protective and supportive.

New facilities are increasingly designed to promote safety. Those refurbishing hospital and residential care facilities are increasingly factoring in principles of safety design. An essential aspect of best practice design is co-design with facility users; that is, staff and patients/residents and their families/whānau (Huang et al 2013).

Design impacts directly on safety. For instance, a well-designed layout can minimise distances between staff, supplies and patients/residents which, in turn, indirectly reduces staff stress and walking time (Joseph and Rashid 2007; Salonen et al 2013). Other design considerations include lighting, flooring, furniture and way-finding signs (Salonen et al 2013).

Some recent examples have shown that properly designed flooring can reduce injury from falls (Gustavsson et al 2015). In an observational study in New Zealand of 278 falls, low-impact flooring reduced the rate of injuries to 22 percent (against 34 percent control flooring patients) and the fracture rate to 0.7 percent (against 2.3 percent in controls). Furthermore, the fall rate did not vary between groups (Hanger 2017). The authors recommended the use of safety flooring in residential care settings. In one review, 11 out of 14 studies reported some reduction in injury from falls on compliant flooring compared with usual flooring (Lachance et al 2017).

Given the high proportion of falls in hospital occurring in the 'bed–bathroom environment', design recommendations include ensuring minimal distances and secure handholds and, to reduce injury, ensuring surfaces are 'forgiving' (Morgan et al 1985).

Design is important, but it's a passive element in patient and resident safety. In a protective and supportive physical environment (Choi et al 2011; Dykes et al 2012), ensuring safe surroundings without unsafe conditions requires system capability and staff acting in certain ways. One example of system capability is access to mobility equipment after hours. One example of a staff action is adjusting mobility aids correctly for each person – see 'Support safe mobilising' in the box on page 4. Regular environmental review and responsive systems for notification of, and attention to, hazards are also essential (Ganz et al 2013).

The falls prevention module for the Releasing Time to Care (The Productive Ward) toolkit offers guidance and evidence-based tools and resources.

A randomised controlled trial in residential facilities promoted function focused care of those with cognitive impairment, which emphasises the importance of nurturing, comfort, individual preferences, and optimal physical activity, rather than merely completing care tasks. A key feature of the study was modification of the physical environment to encourage activity. The study found that flexibility in care to facilitate activity in this new environment resulted in fewer falls in the intervention group (Galik et al 2014). ◆

What actions and elements are essential to creating a safe environment?

In the table below are the actions to take to enable, support and protect the older person in their environment. Standards of care (including low bed rails, the appropriate bed height for each person, and a de-cluttered environment) are important for every older person. But a lot more can be done.

In hospital and residential care environments: for all patients and residents

	ACTION TO TAKE
ENABLE	Familiarise the older person (and those accompanying them) with their new environment.
	Make sure the person can reach the call bell (in bed and toilet areas) – decide which side is best.
	Show the person how to use call bells (in bed and toilet areas) – let them test them.
	Ensure the person can safely reach the possession they use most often – including mobility aids.
SUPPORT SAFE MOBILISING	Consider whether an older person with cognitive impairment needs a lower bed, padding on the floor, arm supports or rails (Metzger et al 2018).
	Set the bed/chair at the right height for the person to get in and out easily and safely.
	Ensure someone has advised the person to wear non-slip, well-fitting footwear, and that they are wearing it.
	Support mobilisation in line with an individualised plan or protocol.
	Ensure mobility equipment is adjusted correctly for the person, and ensure the person can reach it safely.
	Make all staff who interact with the person clearly aware of the safest way to mobilise the person (a signalling system can highlight mobilisation assistance requirements).
PROTECT YOUR PATIENT/RESIDENT	**Clear pathways** Keep patient/resident areas uncluttered and the pathway to the toilet clear.
	Use good lighting effectively Ensure the person can turn on the light in their bedspace; and encourage them to turn the light on if they need to get up at night. Ensure night lights are on at night, and consider leaving the light on in the toilet room at night.
	Lock all wheels Lock all wheels on furniture in the bedspace or room. Lock all wheels on wheelchairs and toilet chairs during transfers on and off, and when stationary. Lock all wheels on hoists when transferring a person between two locations.
	Reduce risk of slipping Mop up water on the floor in wet areas promptly. Clean up spills promptly. Use signs noting wet surfaces when cleaning or dealing with spills.

A study undertaken in residential care found that staff have a good general understanding of risk management. However, staff often focus more on protection and prevention than safety promotion and wellbeing (Clancy and Mahler 2016). All aspects are important for older people in care.

WHAT ACTIONS AND ELEMENTS ARE ESSENTIAL TO CREATING A SAFE ENVIRONMENT? *Continued*

In the home environment: for all older people

Home safety assessment and modifications reduce the rate of falls and risk of falling (Gillespie et al 2012; Naseri et al 2018). Making safety modifications to homes appears to be more effective for people at higher risk, for those older people with severe visual impairment, or for the frail (University of York: Centre for Reviews and Dissemination 2014). It appears that input from an occupational therapist is needed to ensure the modifications are successful (Stevens and Burns 2015).

A **home safety improvement study in Taranaki** indicated that a safety-modification package, including handrails, grab rails, outside lighting, edging for outside steps, and slip-resistant surfacing, may be effective in reducing falls-related injuries at home (Keall et al 2015).

An older person has many options to **make their environment safer** to reduce their risk of falling. Options worth considering include fixing loose rugs, mats and trip hazards; wearing safe footwear (well-fitting, flat shoes with non-slip soles); and considering assistive devices (such as elevated toilet seats) and mobility aids (Avin et al 2015).

Home safety improvements are important for those with cognitive impairment too. A review of three randomised controlled trials showed the impact of assistive home technologies on 245 people with dementia led to falls halving in the intervention groups (Brims 2018).

The outdoor or urban environment (whether the older person is living at home or in residential care) may support or hinder safe mobilisation. Consider **a walk-through audit** of hazards (and consider potential mitigations) with the older person on their usual routes (Curl et al 2016). A study of 384 participants, of which 69 had a fear of falling, revealed that drainage ditches and broken pavements were associated with greater likelihood of fear of falling. On the other hand, low traffic speeds reduced the likelihood of fear (Lee et al 2017).

Notably, a New Zealand trial aimed to reduce hazard-related falls in people aged 75 and over with significant visual impairment (the **VIP trial**). Designed to reduce the risk of these people falling at home, the trial also reduced falls away from home. It was thought that having a trained occupational therapist give individual advice to people in this high-risk group about their home environment enabled a change in behaviour that supported safe mobilisation in other environments (Campbell et al 2005).

The Live Stronger for Longer programme has resources available for order, to share online, or download, including a **Home Safety Checklist**, available at **www.livestronger.org.nz**. ◆

What key actions to take when assessing the safety of older people living in residential care or at home

Undertaking an environmental safety assessment and making modifications help to reduce the number of falls in the home for people identified as having a **high risk of falling, including those who are frail** (Australian Commission on Safety and Quality in Health Care 2009a; Gillespie et al 2012).

Key actions in both residential care and home settings are to:

- assess the older person in their environment and seek perspectives from their family/whānau and carers
- have an appropriate health professional (physiotherapist or occupational therapist) do the assessment, make the safety modifications and help modify the behaviour of the older person (Australian Commission on Safety and Quality in Health Care 2009b)
- explore the choice and acceptability of recommendations for specific equipment, lighting, modifications or behaviour change with the older person, their family/whānau and their carers (Clemson et al 2008; Pighills et al 2011)
- support the older person's decisions (Clemson et al 1999; Clemson et al 2008) about their individual preferences, feelings and daily routines
- consider environmental measures (such as signs or cues) to help orient an older person who is experiencing cognitive decline or delirium. ◆

How to ensure safety when mobile

Mobilisation is necessary to prevent complications associated with immobility and maintain independent functioning. Even so, inpatients report that assistance/help with ambulation and getting out of bed into a chair are two of the five most often missed elements of basic care (Kalisch et al 2014a; Kalisch et al 2014b). A further challenge for staff is to balance a duty of care (to protect patients and residents from the risk of falling) with encouraging mobilisation that helps prevent complications and, by maintaining muscle strength and confidence, protects the older person against falling (Oliver et al 2010).

Helping older patients and residents understand their limitations and the risk of harm from falls (and consequences of them), and how to mobilise safely supports their autonomy and rehabilitation – 'a patient who is not allowed to walk alone rapidly becomes a patient who cannot walk alone' (Healey 2011).

Having family/whānau and other carers involved in mobilising the older person helps everyone. Talking with patients and families/whānau about the practical implications of the risks of particular falls can be supported by a system to signal the level of assistance needed with mobility. Such a system gives visual cues about how much help is needed. Given the number of staff interacting with patients in hospital, this system can provide critical safety information to staff not familiar with the patient – helping to make falls prevention everyone's business. Staff in residential environments are more likely to be familiar with the mobility needs of their residents, although one survey of 147 facility care staff in Australia found that only one-quarter of staff (26.5 percent) were aware that residents were at high risk for falls (Francis-Coad et al 2019).

A troublespot: between the bed and the toilet

A study of falls in residential care revealed that about 75 percent of falls happen in residents' rooms or bathrooms, with 41 percent happening during transfers of the person and 36 percent when they are walking (Rapp et al 2012).

A retrospective study of injurious falls in hospital (Mion et al 2012) highlights that situational factors are not especially unusual or unpredictable:

- The majority of falls happen in the patient's room.
- Almost half of falls involve the bed (transferring into or out of the bed; a small proportion of people roll out of bed).
- Nearly one-fifth of falls had an environmental cause, such as entanglement in linen or tubing, tripping, unlocked bed/chair wheels, or slipping on an air mattress.
- About two-thirds of patients who fell were attached to at least one piece of equipment (eg, IV line or urinary catheter).
- One-third of falls related to toilet needs.

> One review of hospital falls found 45 percent were related to toileting – most on the way from the bed or chair to the bathroom. (Tzeng 2010)

A young, fit person can find it hard to manage the journey from their hospital bed to the toilet when in pain and perhaps attached to one or more machines. Since acutely ill patients are likely to have been administered medication that can make them feel dizzy/faint when trying to mobilise, and since they are likely to do most of their mobilising between their bed and the toilet, attention to appropriate footwear and need for assistance or mobility aids is important in this troublespot (Oliver et al 2010). An older person may have different challenges with mobility and other impairments, problems of urinary urgency or incontinence, creating additional concerns about safety. ◆

How to provide safe care: anticipation, presence, proximity

Familiarising an older person with a new environment, setting things up to facilitate as much self-care as possible and ensuring the person can easily call for help is more than a courtesy. Doing so recognises the older person's right to safe care. In longer-stay areas and home care, staff can learn a person's daily patterns and anticipate their needs. But since staff do not see 80–90 percent of falls in hospitals (Oliver et al 2010), a conversation acknowledging that 'falls hurt' and providing information about ways to reduce the risk of falling can empower older people in our care.

A sign in the bedspace that notes the person's risk of falling is useful to those who understand the risks and how to keep the person safe. Such a sign would also be helpful for an older person with cognitive impairment. Importantly, this type of sign can alert staff to an older person's needs for help with mobility.

An older person does not ask for help lightly: they may think staff are busy (or otherwise unavailable). Or they don't ask because they are unsure help will come in time (Carroll et al 2010). Independence and true reluctance to 'bother the nurse' is a natural combination in many older people, and means that staff have their work cut out to reassure patients and residents that they **can** help, **should** help and **want** to help.

Doing rounds hourly is intended to provide a nursing presence in a way that is experienced as attentive and reliable (Halm 2009). Placing those at higher risk of falling where staff can easily see them improves the chances that staff will respond to the older person's need for help. It's important that all shift team members are aware of which older people are most at risk.

Partnership means working with the older person to identify their particular falls risk factors and plan interventions and supports tailored to their needs and preferences. Bedside handover increases staff presence while providing a forum to elicit and act on the person's concerns, preferences and goals for the next part of the day (Kerr et al 2013).

The people in our care benefit when we get the basics right – and sometimes are harmed when we don't. These elements of safe environment and safe care could have made the difference in Hazel and Gordon's stories. They are making a difference in this example of organisational improvement and response as a result of learning from a patient story. ◆

60 MINUTES OF PROFESSIONAL DEVELOPMENT

This learning activity equals 60 minutes of your professional development.

You can add it to the personal professional record you keep to check off your competence framework requirements.

To complete this learning activity, first read the whole topic and the two required readings, then assess your learning with the 10 self-test questions.

Learning objectives

Reading and reflecting on Topic 5 and the materials in this teaching and learning package will enable you to:

- identify enabling, supporting and protective actions staff can take in relation to falls safety for all patients/residents
- relate older people's experiences of falling (and suggestions for preventing falls) to specific actions staff can take
- describe points to consider when doing an environmental safety assessment
- relate two challenges in falls prevention and elements of safe care to three older people's experiences.

Teaching and learning package

Gather up the resources you'll need. Use the hyperlinks in this topic, or download or print the reference material.

Required reading

These two readings will help you form evidence-informed perspectives about safe environment and safe care.

1. Carroll DL, Dykes PC, Hurley AC. 2010. Patients' perspectives of falling while in an acute care hospital and suggestions for prevention. *Applied Nursing Research* 23(4): 238–41 via webpage.
2. Environmental safety recommendations given in the *Australian Commission on Safety and Quality in Health Care guidebook* relevant to your setting: hospital (pages 57–60), residential care (pages 53–57) or community (pages 63–66).

ADDITIONAL RESOURCES

The CDC compendium of evidenced-based interventions for falls (2015) – see in particular the section on 'home modification'.

The Academy of Geriatric Physical Therapy of the American Physical Therapy Association guideline for management of falls in community dwelling older adults (2015).

Stubbs B, Brefka S, Denkinger MD. 2015. What Works to Prevent Falls in Community-Dwelling Older Adults? Umbrella Review of Meta-analyses of Randomized Controlled Trials. *Physical Therapy* 95(8): 1095–110.

University of York: Centre for Reviews and Dissemination. 2014. Preventing falls in hospitals.

Canterbury District Health Board prototyping via webpage (includes CTV news video clip of 2 minutes 44 seconds).

Case study: falls prevention after discharge from the emergency department – an improvement project led by occupational therapists at Wairarapa District Health Board to identify which older people presenting after having a fall were at high risk and would benefit from a home safety assessment.

User guide and resources from a system to signal the level of assistance needed with mobility.

Patient stories (includes stories about Hazel and Gordon).

Example of organisational improvement and response: learning from a patient story, via webpage (includes video clip of 5 minutes 6 seconds).

An evidence-based summary, which includes lighting, flooring, furniture and way-finding signage among environmental considerations. See Salonen H, Morawska L. 2013. Physical characteristics of the indoor environment that affect health and wellbeing in healthcare facilities: a review. *Intelligent Buildings International* 5(1): 3–25. A pre-publication copy is here; supplement begins on page 32.

The Live Stronger for Longer website has resources available to download, order, or share online.

LIVE STRONGER FOR LONGER
PREVENT FALLS & FRACTURES

10 QUESTIONS

TOPIC 5 Professional development: questions to test your knowledge

PROFESSIONAL DEVELOPMENT ACTIVITY

ANSWER these questions to check you have retained the knowledge reviewed in this topic and readings

ANSWER

1 In the required reading, Patients' perspectives of falling while in an acute care hospital and suggestions for prevention, the patients in the study:
☐ described the reason for their fall as an urgent toileting need coupled with an unfamiliar environment
☐ may have been aware that staff had asked them to request help, but felt that asking for help was bothering staff
☐ felt well informed about their risk of falling, and staff had advised them how to manage their risks.

2 Overall, the material presented in Topic 5 argues that design decisions can contribute directly and indirectly to a safe environment and safe care, but the actions staff take are essential to protect patients and residents from harm.
☐ true
☐ false

3 Staff can support safe mobilising by ensuring beds, chairs and mobility equipment are:
☐ adjusted to the lowest level so a fall to the floor is a reduced distance
☐ adjusted to the height that will be safe for the individual.

4 Two studies of falls in hospitals were cited to support the idea a troublespot is between the bed and toilet. The figures given related to toileting were:
☐ almost half of injurious falls and almost half of all falls
☐ one-fifth of injurious falls and 75 percent of all falls
☐ one-third of injurious falls and 45 percent of all falls.

ASSESS the processes used for safe environment and safe care in your setting

ASSESS

5 Review the specific recommendations in the *Australian Commission on Safety and Quality in Health Care guidebook* relevant to your setting: hospital (pages 57–60), residential care (pages 53–57) or community (pages 63–66).
What would need to change to make the environment safer for those in your care, to meet these recommendations?

6 Think of your workplace. How would a staff member meeting a patient/resident for the first time be alerted to that person's particular needs for help with being mobile?

Look at the section 'How to ensure safety when mobile' in this topic. Is there a system that can help to signal the level of help needed with mobility that would be useful in your setting?

7 Describe three specific things you already do (or could do) to involve patients and their families/whānau in handovers between staff members.
1.
2.
3.

Outline three learnings or insights and how you will APPLY them in your practice

APPLY

8 My first learning/insight is:

I will apply it in practice by:

9 My second learning/insight is:

I will apply it in practice by:

10 My third learning/insight is:

I will apply it in practice by:

LEARNER	NAME:	PROFESSION:	DESIGNATION:
DATE:		REGISTRATION ID:	WORKPLACE:

Validation that learner has completed this professional development activity		Signature:
NAME:	PROFESSION:	CONTACT:
DATE:	REGISTRATION ID:	WORKPLACE:

For answers to the above self-assessment questions click here.

REFERENCES

Australian Commission on Safety and Quality in Health Care. 2009a. *Preventing falls and harm from falls in older people: best practice guidelines for Australian hospitals 2009*. Sydney: Australian Commission on Safety and Quality in Health Care.

Australian Commission on Safety and Quality in Health Care. 2009b. *Preventing falls and harm from falls in older people: best practice guidelines for Australian residential aged care facilities 2009*. Sydney: Australian Commission on Safety and Quality in Health Care.

Avin KG, Hanke TA, Kirk-Sanchez N, et al. 2015. Management of falls in community-dwelling older adults: clinical guidance statement from the Academy of Geriatric Physical Therapy of the American Physical Therapy Association. *Physical Therapy* 95(6): 815–34.

Brims L, Oliver K. 2018. Effectiveness of assistive technology in improving the safety of people with dementia: a systematic review and meta-analysis. *Aging & Mental Health* 10: 1–10. DOI: 10.1080/13607863.2018.1455805. [Epub ahead of print]

Campbell AJ, Robertson MC, La Grow SJ, et al. 2005. Randomised controlled trial of prevention of falls in people aged ≥75 with severe visual impairment: the VIP trial. *BMJ* 331(7520): 817.

Carroll DL, Dykes PC, Hurley AC. 2010. Patients' perspectives of falling while in an acute care hospital and suggestions for prevention. *Applied Nursing Research* 23(4): 238–41.

Choi YS, Lawler E, Boenecke CA, et al. 2011. Developing a multi-systemic fall prevention model, incorporating the physical environment, the care process and technology: a systematic review. *Journal of Advanced Nursing* 67(12): 2501–24.

Clancy A, Mahler M. 2016. Nursing staffs' attentiveness to older adults falling in residential care–an interview study. *Journal of clinical nursing* 25(9–10): 1405–15.

Clemson L, Cusick A, Fozzard C. 1999. Managing risk and exerting control: Determining follow through with falls prevention. *Disability and Rehabilitation* 21(12): 531–41.

Clemson L, Mackenzie L, Ballinger C, et al. 2008. Environmental interventions to prevent falls in community-dwelling older people: A meta-analysis of randomized trials. *Journal of Aging and Health* 20(8): 954–71.

Curl A, Aspinall P, Ward Thompson C, et al. 2016. Developing an audit checklist to assess outdoor falls risk. *Urban Design and Planning* 169(DP3): 138–53.

Dykes PC, I-Ching EH, Soukup JR, et al. 2012. A Case Control Study to Improve Accuracy of an Electronic Fall Prevention Toolkit. In: *AMIA Annual Symposium Proceedings*, p. 170): American Medical Informatics Association.

Francis-Coad J, Hang JA, Etherton-Beer C, et al. 2019. Evaluation of care staff knowledge, confidence, motivation and opportunity for preventing falls in residential aged care settings: A cross-sectional survey. *Int J Older People Nurs* 14(2): e12224. DOI: 10.1111/opn.12224. Epub 2019 Feb 27.

Galik E, Resnick B, Hammersla M, et al. 2014. Optimizing function and physical activity among nursing home residents with dementia: testing the impact of function-focused care. *The Gerontologist* 54(6): 930–43. DOI: 10.1093/geront/gnt108.

Ganz D, Huang C, Saliba D, et al. 2013. Preventing falls in hospitals: a toolkit for improving quality of care. *Annals of Internal Medicine* 158(5 Pt 2): 390–6.

Gillespie LD, Robertson MC, Gillespie WJ, et al. 2012. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 9(11).

Gustavsson J, Bonander C, Andersson R, et al. 2015. Investigating the fall-injury reducing effect of impact absorbing flooring among female nursing home residents: initial results. *Injury Prevention* 21: 320–4.

Halm MA. 2009. Hourly rounds: what does the evidence indicate? *American Journal of Critical Care* 18(6): 581–4.

Hanger H. 2017. Low-Impact Flooring: Does It Reduce Fall-Related Injuries? *JAMDA* In-press: 1–4.

Healey F. 2011. *Implementing a fall prevention program*. URL: https://psnet.ahrq.gov/perspectives/perspective/114 (accessed March 10).

Healey F, Darowski A. 2012. Older patients and falls in hospital. *Clinical Risk* 18(5): 170–6.

Huang Y-C, Chu C-L, Lee S-NC, et al. 2013. Building users' perceptions of importance of indoor environmental quality in long-term care facilities. *Building and Environment* 67: 224–30.

Joseph A, Rashid M. 2007. The architecture of safety: hospital design. *Current Opinion in Critical Care* 13(6): 714–9.

Kalisch BJ, Lee S, Dabney BW. 2014a. Outcomes of inpatient mobilization: a literature review. *Journal of Clinical Nursing* 23(11–12): 1486–501.

Kalisch BJ, Xie B, Dabney BW. 2014b. Patient-reported missed nursing care correlated with adverse events. *American Journal of Medical Quality* 29(5): 415–22.

Keall MD, Pierse N, Howden-Chapman P, et al. 2015. Home modifications to reduce injuries from falls in the Home Injury Prevention Intervention (HIPI) study: a cluster-randomised controlled trial. *The Lancet* 385(9964): 231–8.

Kerr D, Lu S, McKinlay L. 2013. Bedside handover enhances completion of nursing care and documentation. *Journal of Nursing Care Quality* 28(3): 217–25.

Lachance CC, Jurkowski MP, Dymarz AC, et al. 2017. Compliant flooring to prevent fall-related injuries in older adults: A scoping review of biomechanical efficacy, clinical effectiveness, cost-effectiveness, and workplace safety. *PLoS ONE* 12(2): e0171652. DOI: 10.1371/journal.pone.0171652.

Lee S, Lee C, Ory MG, et al. 2017. Fear of Outdoor Falling Among Community-Dwelling Middle-Aged and Older Adults: The Role of Neighborhood Environments. *Gerontologist*. DOI: 10.1093/geront/gnx123. [Epub ahead of print].

Metzger ED, Racine AM, Inouye SK. 2018. Advanced Dementia in Long-Term Care: Avoiding the Pitfalls of Fall Prevention. *The American Journal of Geriatric Psychiatry* 26(4): 416–18. DOI: 10.1016/j.jagp.2017.12.007.

Miake-Lye IM, Hempel S, Ganz DA, et al. 2013. Inpatient fall prevention programs as a patient safety atrategy: A systematic review. *Annals of Internal Medicine* 158(5 (Part 2)): 390–6.

Mion LC, Chandler AM, Waters TM, et al. 2012. Is it possible to identify risks for injurious falls in hospitalized patients? *The Joint Commission Journal on Quality and Patient Safety* 38(9): 408–AP3.

Morgan VR, Mathison JH, Rice JC, et al. 1985. Hospital falls: a persistent problem. *American Journal of Public Health* 75(7): 775–7.

Naseri C, Haines TP, Etherton-Beer C, et al. 2018. Reducing falls in older adults recently discharged from hospital: a systematic review and meta-analysis. *Age and Ageing* 23 March. DOI: 10.1093/ageing/afy043. [Epub ahead of print].

Oliver D, Healey F, Haines TP. 2010. Preventing falls and fall-related injuries in hospitals. *Clinics in Geriatric Medicine* 26(4): 645–92.

Pighills AC, Torgerson DJ, Sheldon TA, et al. 2011. Environmental assessment and modification to prevent falls in older people. *Journal of the American Geriatrics Society* 59(1): 26–33.

Rapp K, Becker C, Cameron ID, et al. 2012. Epidemiology of falls in residential aged care: analysis of more than 70,000 falls from residents of bavarian nursing homes. *Journal of the American Medical Directors Association* 13(2): e1–e6.

Salonen H, Lahtinen M, Lappalainen S, et al. 2013. Physical characteristics of the indoor environment that affect health and wellbeing in healthcare facilities: A review. *Intelligent Buildings International* 5(1): 3–25.

Stevens JA, Burns BJ. 2015. *A CDC Compendium of Effective Fall Interventions: What Works for Community-Dwelling Older Adults. 3rd ed.* Atlanta (GA): Centers for Disease Control and Prevention. National Center for Injury Prevention and Control. Division of Unintentional Injury Prevention.

Tzeng H-M. 2010. Understanding the prevalence of inpatient falls associated with toileting in adult acute care settings. *Journal of Nursing Care Quality* 25(1): 22–30.

University of York: Centre for Reviews and Dissemination. 2014. *Preventing Falls in the Community*. University of York: Centre for Reviews and Dissemination (CRD).

LIVE **STRONGER** FOR **LONGER**

PREVENT FALLS & FRACTURES