

TOPIC 6



HEALTH QUALITY & SAFETY
COMMISSION NEW ZEALAND
Kupu Taurangi Hauora o Aotearoa

After a fall: what should happen?

How you can use Topic 6	1
Key messages in Topic 6	2
What Topic 6 covers	2
Which falls require review and reporting?	2
What are the two aims of care after a fall?	3
When older people are likely to fall, and what happens	4
Why every fall represents an opportunity to 'stand up to falls'	6
How we move from reporting to action	6
How a fall is an opportunity to improve systems, methods and success factors	7
60 minutes of professional development	8
Additional resources	9
Professional development: questions to test your knowledge	10
References	11

How you can use **Topic 6**

Use Topic 6 as:

- an information resource that explains the evidence and rationale for what to do after an older person falls.
- 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



Key messages in Topic 6

- Your immediate concern after an older person falls should be to care for them and attend to any injuries.
- You should assess the causes of the fall. Was it a 'hot' fall that was caused by a medical event, or a 'cold' fall associated with other risk factors? Assess the older person for risk factors and act to eliminate, isolate or minimise those causes.
- Action may require you to refer the older person to other health professionals and/or a fracture liaison service, as appropriate.
- Use the appropriate incident management systems to report the fall (such as adverse event systems). Report hip fractures to the hip fracture registry.
- A fall is an opportunity to learn and improve systems.



What Topic 6 covers

Topic 6 looks at how a fall by an older person requires prompt attention to any injuries, and an investigation of underlying conditions that might have caused the fall, such as an acute medical event like an infection or stroke. Most importantly, any fall should trigger an assessment and actions focused on reducing the risk of the older person falling again. When a fall occurs in a care setting, we can reasonably expect the providers will make an appropriate assessment and take appropriate action. Another obligation is to look at what we can learn from each fall the older person experiences, and apply that learning to managing the risk of falling by others in our care.

In New Zealand, since falls with serious harm are one of the largest group of reportable adverse events (Health Quality & Safety Commission 2019), the learning and recommendations in these reports could be used to prevent falls. An example of what that might look like is a brief summary of a review of inpatient falls undertaken by the United Kingdom's National Patient Safety Agency (NPSA). This required reading outlines problems in the quality of care (and reporting) and good practices for caring for the older person after their fall. The second required reading is not specific to falls, but provides an overview of how incident reporting can improve patient safety.



Which falls require review and reporting?

For the purposes of caring for an older person after a fall and learning from such incidents, a useful operational definition is from interRAI assessment tools: 'Any unintentional change in position where the person ends up on the floor, ground, or other lower level; includes falls that occur while being assisted by others' (Morris et al 2011; Morris et al 2010). Using an underpinning definition may help to achieve consistency in understanding and data collection.

What's in? 'Near misses', such as when an older person feels faint or that their legs are giving way and a staff member has been able to safely lessen the impact or distance of the fall (Ganz et al 2013). Some provider organisations think of a 'near miss fall' as a fall that would have happened if the older person or other person had done nothing to prevent it (Health Quality & Safety Commission 2012; World Alliance for Patient Safety 2005).

WHICH FALLS REQUIRE REVIEW AND REPORTING? *Continued*

What's out? Planned actions in response to known or likely reactions. For example, intended changes in position to a lower level don't count as falls. For example, when an older person with postural hypotension sits down quickly as a self-management measure after realising they stood up too fast (don't miss the opportunity here to prevent a fall by **assessing risk factors** and **implementing individualised interventions**). Another example is a resident whom staff regularly observed crawling out of bed to sleep on the floor (the staff put a second mattress on the floor to make this comfortable and safe).

What the incident report should cover

In the hospital or ARC setting, an incident report would help to achieve consistency and completeness in reporting falls incidents. One common template you could use to detail the fall is the **fall analysis template**, developed as a question bank and guide. The template is based on a 'human factors' framework, allowing for learning and improvement across a range of factors from older person to organisation of care. ♦

**What are the two aims of care after a fall?**

Care after a fall aims to do two things, which, in practice, may not be entirely separate.

The first aim is prompt clinical assessment focused on:

- managing injuries and the risk of further harm. Falls are associated with significant losses in independence and increased morbidity and mortality (Rubenstein 2006). So prompt diagnosis and proper treatment of injuries are critically important for the older person to recover in the best possible way and to avoid secondary complications, such as those related to pain and restriction of mobility after a fall (Healey et al 2011). Investigate also whether the older person struck their head, because the consequences of head injury such as cerebral bleeds can lead to death
- investigating the cause of a fall and any **loss or near-loss of consciousness** (Kenny et al 2013), as the fall may signify an undiagnosed problem or deterioration relating to a known condition (Healey and Scobie 2007; Rubenstein 2006). These are termed 'hot falls' and the commonest causes include infection, stroke and medication side effects. Urgent medical assessment is needed in these cases (Campbell and Robertson 2010).

How do we reduce the risk of this person falling again?

Immediate responses when finding an older person has collapsed

In any setting, immediate responses on finding an older person who appears to have collapsed should follow the **ABCDE approach**: assessment of *Airway, Breathing, Circulation, Disability* (level of consciousness), and *Exposure/ Examination* to ask the person about the pain (including its location), and discover indications of injury such as a shortened and externally rotated leg (Thim et al 2012). A **post-falls assessment form** can be used.

Other first response actions are to:

- seek assistance; sometimes the ambulance should be called, if injuries have been severe or a serious fracture is suspected.
- help the person find a comfortable position until safe handling or transferring can happen (ie, after injuries have been assessed)
- offer reassurance
- manage any environmental hazard implicated in the fall and which may put others in danger.

WHAT ARE THE TWO AIMS OF CARE AFTER A FALL? *Continued*

The **second aim** of care after a fall is secondary prevention, since a previous fall is a risk factor for future falls (Oliver et al 2010). A review done after the fall is an identified component of effective falls prevention programmes (Miake-Lye et al 2013a; Oliver et al 2010). The review involves a systematic and interdisciplinary, **multifactorial assessment (or reassessment) of risk factors** and **implementation (or modification) of individualised interventions**. Interventions may be as clinically complex as **reviewing and modifying medicine use**, or as practical and simple as making sure the older person has well-fitting footwear, such as shoes with non-slip soles. ♦



When older people are likely to fall, and what happens

Most older people fall when they are walking or being transferred between locations (Mion et al 2012; Rapp et al 2012; Stevens et al 2014). In contrast to high-energy trauma, falls from standing height (or lower) are considered low-energy injuries. Even so, these types of fall can cause a head injury or fracture a hip (Ensrud 2013; Mirick and Wood 2014). Falling backwards to a sitting position is less likely to cause injury than falling forward, sideways, or backwards and landing flat (Stevens et al 2014). However, for some, the consequences of a fall are loss of confidence and fear of falling, which may lead to both restricted activities and overall poorer quality of life (Rubenstein 2006; Schepens et al 2012).

An injury may not be immediately obvious, or may manifest after some time, or the diagnosis may be delayed. The appropriate health professional should complete an **ACC45 Injury Claim Form (plus associated documentation)** when the older person is examined after their fall. Completing the claim at this point is essential should the older person require further treatment, physiotherapy to strengthen lower limbs or balance, or home support.

The ABCs: factors that make older people more at risk of harm when they fall

One easy way to remember several factors that make older people more at risk of injury and harm when they fall is the ABC triggers (Boushon et al 2012):

- **A**ge – fall-related injuries requiring hospital admission increase exponentially from age 65 (Peel et al 2002), and a significantly higher proportion of the ‘oldest old’ (those aged 85 and over) require treatment for fall-related injuries (Clegg et al 2013; Stevens et al 2014). Frailty may be more important than chronological age for risk of injury, harm and poor recovery (Dinsmore 2013).
- **B**one – prolonged steroid use or metastatic bone cancer may be factors, but fracture risk increases with advancing age due to skeletal fragility associated with osteoporosis (Ensrud 2013).
- **AntiCo**agulation – the intended effects of anticoagulant or antiplatelet medicines, or unintended effects of alcohol misuse, may cause blood thinning (Eisman et al 2012; Mirick and Wood 2014; Pieracci et al 2007).

Susceptibility to injury and harm

Three types of injuries that older people are susceptible to are injuries to skin and soft tissue, fractures and head injuries.

Injuries to skin and soft tissue

Skin tears, superficial cuts and abrasions, bruises, sprains and strains are the most commonly reported falls-related injuries (Clegg et al 2013), yet these may not be minor (eg, skin lacerations requiring suturing). Also, injuries in older people can be slow to heal.

WHEN OLDER PEOPLE ARE LIKELY TO FALL, AND WHAT HAPPENS *Continued***Fractures**

Fragility fractures occur in older people where they would not in a young healthy person – fractures in people aged over 50 should be considered osteoporotic until this is ruled out (Butler et al 1996). Fractures occur in around 10–15 percent of the falls of older people living in the community (Ensrud 2013). Possible fractures include wrist fractures, hip fractures, vertebral fractures and pelvic fractures.

The orthogeriatric model of care and fracture liaison services are designed to meet the needs of older people with fractures.

- **Wrist fractures** are the most common at 19 percent of all falls-related fractures, and are often associated with forwards or backwards falls onto an outstretched hand. They are more common than hip fractures in people aged 65 to 75 (Ensrud 2013).
- **Hip fractures** are about 14 percent of all fractures, resulting from about 1 percent of falls (Ensrud 2013). They are more likely to result from sideways falls (Ensrud 2013). Hip fractures are more common than wrist fractures after the age of 75. This is likely due to slower reflexes and age-related changes in balance strategies for avoiding falls (Rubenstein 2006). The incidence of older people living in residential care who experience a hip fracture is 10 times higher than in older people living the community (Studer et al 2013).
- **Vertebral fractures** are the most common manifestation of osteoporosis. Even so, many are asymptomatic, so only 25–33 percent of radiographically identified vertebral fractures are clinically diagnosed. Vertebral fractures can be caused by just a small trip that jars the spine, presenting most commonly as back pain (Ensrud 2013).
- **Pelvic fractures** are among the 40 percent of 'other fragility fractures', most commonly occurring after a fall to the side (Ensrud 2013). They frequently involve the pubic rami, with concomitant fracture in the posterior pelvic ring. This makes these injuries more unstable than usually thought (Krappinger et al 2010). Older people are at significantly higher risk of undetected pelvic haemorrhage, which may only manifest in a continuously deteriorating condition (Kinsella et al 2014).

If an older person has experienced a fracture, ensure the fracture is treated, enter registry data (for hip fractures) and refer the person to a fracture liaison service. The International Osteoporosis Foundation's 'Summary of Gaps in Bone Care' (Harvey and McCloskey 2016) has identified secondary fracture prevention as the number 1 gap in the system. In New Zealand, an Auckland hospital study showed that over 1,500 patients presented with fragility fracture in a one-year period; 82 percent of these required admission to hospital for an average of 20 days. Yet, only 24 percent of these patients received a potent bisphosphonate for osteoporosis during their admission or in the following year (Braatvedt et al 2017).

Head injuries

Falls are the most common cause of head injuries in older people and are a common reason for hospital admission after a fall (Pieracci et al 2007). While a primary injury to the head may not cause any injury to the brain, in older people risk is heightened for secondary intracranial injuries, which may progress over hours and days (Department of Health 2013; Pieracci et al 2007). Reasons for increased risk of intracranial haemorrhage and subdural haematoma include age-related cerebral fragility (caused by cerebral atrophy and vascular rigidity) and the use of oral anticoagulants or anti-platelet medicines (Department of Health 2013; Mirick and Wood 2014).

When head injury is suspected in an older person, clinical assessment is necessary to determine what observation, investigation and referral is necessary (Kenny et al 2013). Protocols in specific settings should be informed by the evidence-based recommendations (see guidelines listed in 'Clinical resources') and the knowledge that 'being older does matter' in brain injury (Department of Health 2013; Mirick and Wood 2014). Some protocols for care after a fall recommend a period of neurological observations for unwitnessed falls (where head injury cannot be excluded), based on the assumption that if the older person **has** hit their head they risk injuring their brain (Healey et al 2011; Mlake-Lye et al 2013b).

Informing key people

In the hospital or ARC setting, staff need to know when and how to escalate concern about an older person's deteriorating condition. Taking the history of an older person with cognitive impairment and assessing their injury will rely heavily on an understanding of the person's usual behaviour, because any change after a fall in what is 'normal for them' should be investigated further.

Importantly, family/whānau will want to know their loved one has had a fall and may wish to be with them. ♦



Why every fall represents an opportunity to 'stand up to falls'

In addition to the advantages of looking for the first time at risk factors and interventions (or revisiting them), with sensitivity, you can turn an older person's fall into an opportunity. While the risk of falling increases with age, falls are not inevitable. The message for the older person is: *You can do something about it.* Being aware of what resources and services are available and what referrals would be suitable for this person is **your** first step in supporting older people to love their **independence**.

Natural inclinations of health professionals, caregivers and families/whānau to protect an older person can be balanced against exploring the person's resourcefulness and problem-solving ability (while respecting their right to do as they choose) (Haines et al 2015).

A better outcome than 'fear of falling' is 'falls-related efficacy', which refers to confidence in a person's ability to perform the activities of daily living without falling or losing balance (Schepens et al 2012). It's possible that the person who has fallen may reconsider what proved to be risky activities (Kaplan and Fastman 2003), choose to manage a newly revealed limitation, or look at options for summoning help (such as obtaining and using a monitored personal alarm). For an older person who falls frequently, perhaps the pattern of falls – and suitable supports to minimise the risk of injury – is becoming clearer. ♦

While the risk of falling does increase with age, falls are not inevitable. The message for the older person is: *You can do something about it.*

The emergency department is an opportunity for falls prevention

When an older person has fallen and presents to the emergency department this is an opportunity for risk assessment, interventions to address risk factors and referrals to services such as fracture liaison services, community or in-home strength and balance exercise programmes, occupational therapy for home safety assessment, to an optometrist, or to a geriatrician for review. Some studies indicated that interventions starting in the emergency department can prevent falls when the recommendations are adhered to (Mikolaizak et al 2017; Barker et al 2019). Using an 'attitudes to falls-related interventions scale' at baseline may predict those most likely to adhere to the advice.



How we can act to prevent future falls

Learning and improvement starts with understanding *what happened* and *why it happened*. Investigation of a fall is based on the following:

- Interview with the person who fell, and anyone else who witnessed the fall. When taking a history ask about exactly what happened, are there environmental aspects that can be modified, are there functional issues that mean the older person is more at risk, or certain activities. Think about interactions among the individual's status, their actions at the time of the fall and the environment. This dynamic aspect of fall risk is useful in working out ways to avoid future falls (Klenk et al 2017).

Recommendations tell us: What actions to take to reduce the possibility of a fall happening again in similar circumstances.

HOW WE MOVE FROM REPORTING TO ACTION *Continued*

- In the hospital or ARC setting, any case notes, which, as part of the continuous record for the older person, supply information about the circumstances of the fall, vital signs and other pertinent observations, injuries, investigations, treatment and referral.
- In the hospital or ARC setting, the incident report, which captures what was known about the fall at the time and is best completed by the staff member most closely associated with the event (in unwitnessed falls, this is likely to be the staff member first on the scene).

Analysis determines *what would prevent it happening again* (Mahajan 2010) to arrive at recommendations for improvement. Analysis is designed to facilitate learning and improvement. Recommendations tell us: *what actions to take to reduce the possibility of a fall happening again in similar circumstances.*

While each fall event is unique, similarities and patterns show up when multiple events are analysed for local or national action. **Open Book reports** give us lessons and learning from falls in community, residential and hospital settings (see reports from **March 2017** and **April 2015**).

When a fall is considered to have caused serious harm (ie, death or serious harm (such as a hip fracture) that needs further treatment) in-depth adverse event review is required using a human factors methodology. The Health Quality & Safety Commission's policy on **National Adverse Events** explains further and has useful links.

We owe the older person and their family/whānau the respect of understanding what happened and why. When there is a high degree of harm, we need to do a robust and in-depth review. It's not enough to say 'they didn't use the call bell' or 'they climbed over the bedrails'. We want to understand 'why?' Ideally system-level learning will occur, but this requires good reviews with findings clearly identified and recommendations that will address the findings.

The Health Quality & Safety Commission's **Learning from adverse events** report (2019) shows that four contributing themes appear to underpin reported harm from falls: situational factors, local working conditions, organisational factors and communication systems. Each fall is an opportunity to understand these factors and improve the systems. ◆



How a fall is an opportunity to improve systems, methods and success factors

It's critical that the reporting process is easy for reporters to use, whether it is paper-based or electronic. Highly structured incident management systems make it easy to classify, analyse and aggregate data (World Alliance for Patient Safety 2005). Narrative approaches providing contextual detail and insights may require additional input for classification of data, but allowing for the reporter's account of events implicitly values their observations (World Alliance for Patient Safety 2005).

What makes an incident management system successful is that action is taken to improve patient safety. Success depends less on forms and formats, and more on a culture of open reporting and learning, in which: (Mahajan 2010)

- reporting is safe and encouraged
- analysis is undertaken
- recommendations are implemented and learning is disseminated
- staff involved with the fall receive feedback (World Alliance for Patient Safety 2005)
- it is important that patients and their families/whānau and carers are involved in, and get feedback on, the findings of any review.

When an older person falls, we need to give them the best care possible. Although a fall presents an opportunity for learning for everyone involved, we are uniquely placed to make that learning benefit others in our care. While much of this section relates to facility settings, primary care can learn and adapt to injury surveillance processes. The fracture liaison services are an important link. ◆



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 6 and the materials in this teaching and learning package will enable you to:

- outline interRAI's definition of 'fall'
- list falls-related injury types and identify those more commonly seen in the older person's own setting
- outline reasons why older people are more susceptible to injury, and consider how to care for an older person after they fall
- describe the purpose of assessment/reassessment of risk factors after a fall
- review factors so that learning from incidents results in action to improve patient safety.

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 how what should happen after a fall.

1. Healey F, Darowski A, Lamont T, et al. 2011. Essential care after an inpatient falls: summary of a safety report from the National Patient Safety Agency. *BMJ* (342): 382–3 via [PDF](#), kindly made available by *BMJ*.
2. Mahajan RP. 2010. Critical incident reporting and learning. *British Journal of Anaesthesia* 105(1): 69–75, via [webpage](#) or [PDF](#).

ADDITIONAL RESOURCES

Recommended readings/resources

The Commission's Open Book report on lessons learnt from reviewing patient falls is available [here](#).

The Commission's national reportable events policy is available [here](#).

World Alliance for Patient Safety. 2005. *WHO Draft Guidelines for Adverse Event Reporting and Learning Systems. From Information to Action*. Geneva: World Health Organization via [webpage](#).

Other resources

Ask, assess, act resources in relation to multifactorial assessment and intervention in post-fall review:

- [Pocketcard](#) includes a panel 'Care after a fall'.
- Topic 3: [Falls risk assessment: a multifactorial approach](#).
- Topic 4: [Addressing risk factors in an individualised care plan](#).

Clinical resources

Skin tears

A simple tear... but a complex wound ([PDF](#), kindly supplied by *Nursing Review*).

Trauma

Mirick GE, Wood JH. 2014. Assessment of geriatric trauma: special considerations. *Current Geriatrics Reports* 3: 122–7 via [webpage](#).

Head injury guidelines

NICE 2014 CG176 Head injury via [webpage](#).

Hip fracture guidelines

See [Topic 7](#).

[Australian and New Zealand Hip Fracture Registry Guideline for Hip Fracture Care](#).

Consumer resources

ACC resources: ACC7745 '[Love your independence](#)' and ACC7771 '[Home safety checklist](#)'

Additional Live Stronger for Longer resources can be downloaded, shared online or copies ordered at: www.livestronger.org.nz.

10 QUESTIONS

TOPIC 6 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

1	The first required reading outlines the findings of an analysis of reports on patient falls in the National Health Service in the United Kingdom. It gives one number of falls causing fractures and intracranial injuries and another number of these falls, which also had some shortfall in care. What is the percentage of shortfall in care after a fall? 10 percent 14 percent 20 percent
2	Topic 6 presents information about falls-related injuries in older people that suggests: <i>(select all that apply)</i> age-related declines in physiological functioning is one reason an older person is more likely to sustain injuries when they fall special vigilance is needed when a cognitively impaired person cannot give details about their fall in older people, some injuries may take hours or days to become apparent.
3	Scenario Mrs Brown, who is normally steady on her feet, is walking down the hall unaccompanied, and you see that she looks unsteady and might faint. As you instinctively reach out to steady her, she tips against the wall with a slight knock to her head. You are able to hold her there while pulling up a nearby chair and lowering her gently into it. Which statement or statements are relevant to this scenario? <i>(select all that apply)</i> Mrs Brown's incident is a fall, because it is an unintended change in position to a lower level. As Mrs Brown has knocked her head, she should be considered to be at risk of a brain injury. The risk of brain injury after her knock will increase if Mrs Brown is taking oral anticoagulants. Mrs Brown should be clinically examined to determine her injuries and what close monitoring is required and for how long. Clinical examination should also determine the cause of Mrs Brown's unsteadiness and near loss of consciousness.
4	In New Zealand, injury claims are lodged with the ACC45 form. Reasons to complete that form after a fall include: <i>(select all that apply)</i> documentation is in place should the person need further treatment or support later a completed form will help to reduce organisational liability for any fall that happened to a patient or resident the possibility of a delayed diagnosis when injuries are not immediately apparent or are revealed by later investigation.
5	The second required reading argues that a 'human factors' approach to analysing reported incidents should consider the factors that set up the conditions for an incident to occur. Which one factor is not cited as a main factor? the patient work environment the task regulatory environment the team

ANSWER

ASSESS the processes used for follow-up after a patient/resident/client falls at your workplace

6	Does your workplace have a documented process specific to care after a fall? yes no don't know
7	How strongly do you agree with this statement: 'I am confident that I will hear back on the outcome of any incident report that I complete.' agree strongly agree neither agree nor disagree disagree disagree strongly
	Given the discussion in the second required reading (question 5) about incident reporting, and your confidence (first part of this question), what should change (or stay the same) at your workplace?

ASSESS

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

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:

APPLY

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:	

REFERENCES

- Barker A, Cameron P, Flicker L, et al. 2019. Evaluation of RESPOND, a patient-centred program to prevent falls in older people presenting to the emergency department with a fall: A randomised controlled trial. *PLoS Med* 16(5): e1002807.
- Boushon N, Nielsen G, Quigley P, et al. 2012. *How-to Guide: Reducing Patient Injuries from Falls*. Cambridge, MA: Institute for Healthcare Improvement.
- Braatvedt G, Wilkinson S, Scott M, et al. 2017. Fragility fractures at Auckland City Hospital: we can do better. *Arch Osteoporos* 12(1): 64. DOI: 10.1007/s11657-017-0353-0. Epub 14 July 2017.
- Butler M, Norton R, Lee-Joe T, et al. 1996. The risks of hip fracture in older people from private homes and institutions. *Age and ageing* 25(5): 381–5.
- Campbell AJ, Robertson MC. 2010. Comprehensive approach to fall prevention on a national level: New Zealand. *Clinics in Geriatric Medicine* 26(4): 719–31. DOI: dx.doi.org/10.1016/j.cger.2010.06.004.
- Clegg A, Young J, Iliffe S, et al. 2013. Frailty in elderly people. *The Lancet* 381(9868): 752–62.
- Department of Health WA. 2013. Post-Fall Management Guidelines in WA Healthcare Settings. Perth: Health Strategy and Networks: Department of Health, Western Australia.
- Dinsmore J. 2013. Traumatic brain injury: an evidence-based review of management. *Continuing Education in Anaesthesia, Critical Care & Pain* 13(6): 189–95.
- Eisman JA, Bogoch ER, Dell R, et al. 2012. Making the first fracture the last fracture: ASBMR task force report on secondary fracture prevention. *Journal of Bone and Mineral Research* 27(10): 2039–46.
- Ensrud KE. 2013. Epidemiology of fracture risk with advancing age. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences* 68(10): 1236–42.
- 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.
- Haines TP, Lee DCA, O'Connell B, et al. 2015. Why do hospitalized older adults take risks that may lead to falls? *Health Expectations* 18(2): 233–49.
- Harvey N, McCloskey E. 2016. *Gaps and Solutions in Bone Health: A Global Framework for Improvement*. Nyon: International Osteoporosis Foundation.
- Healey F, Darowski A, Lamont T, et al. 2011. Essential care after an inpatient fall: summary of a safety report from the National Patient Safety Agency. *British Medical Journal* 342(d349): doi: 10.1136/bmj.d329.
- Healey F, Scobie S. 2007. *Slips, trips and falls in hospital (The third report from the Patient Safety Observatory)*. London: National Patient Safety Agency.
- Health Quality & Safety Commission. 2012. New Zealand Health and Disability Services – National reportable events policy 2012. Wellington: Health Quality & Safety Commission. [Note: this policy was updated in 2017.]
- Health Quality & Safety Commission. 2019. *Learning from adverse events: Adverse events reported to the Health Quality & Safety Commission*. Wellington: Health Quality & Safety Commission.
- Kaplan H, Fastman BR. 2003. Organization of event reporting data for sense making and system improvement. *Quality and Safety in Health Care* 12(suppl 2): ii68–ii72.
- Kenny RA, Romero-Ortuno R, Cogan L. 2013. Falls. *Medicine* 41(3): 155–9.
- Kinsella G, Olver J, Ong B, et al. 2014. Traumatic brain injury in older adults: does age matter. In, *Understanding Traumatic Brain Injury: Current Research and Future Directions* (pp. 356–69). New York, NY: Oxford University Press.
- Klenk J, Becker C, Palumbo P, et al. 2017. Conceptualizing a dynamic fall risk model including intrinsic risks and exposures. *Journal of the American Medical Directors Association* 18(11): 921–7. DOI: 10.1016/j.jamda.2017.08.001.
- Krappinger D, Kammerlander C, Hak DJ, et al. 2010. Low-energy osteoporotic pelvic fractures. *Archives of Orthopaedic and Trauma Surgery* 130(9): 1167–75.
- Mahajan R. 2010. Critical incident reporting and learning. *British Journal of Anaesthesia* 105(1): 69–75.
- Miake-Lye IM, Hempel S, Ganz DA, et al. 2013a. Inpatient fall prevention programs as a patient safety strategy: A systematic review. *Annals of Internal Medicine* 158(5 (Part 2)): 390–6.
- Miake-Lye IM, Hempel S, Ganz DA, et al. 2013b. *Preventing in-facility falls*. Rockville (MD): Agency for Healthcare Research and Quality.
- Mikolaizak AS, Lord SR, Tiedemann A, et al. 2018. Adherence to a multifactorial fall prevention program following paramedic care: Predictors and impact on falls and health service use. Results from an RCT a priori subgroup analysis. *Australasian journal on ageing* 37(1): 54–61.
- 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.
- Mirich GE, Wood JH. 2014. Assessment of geriatric trauma: special considerations. *Current Geriatrics Reports* 3(2): 122–7.
- Morris J, N, Belleville-Taylor P, Fries B, E, et al. 2011. *interRAI Long-Term Care Facilities (LTCF) Assessment Form and User's Manual*. Version 9.1, Australian Edition. ed. University of Queensland. Washington DC: interRAI.
- Morris JN, Berg K, Bjorkgren M. 2010. *interRAI Clinical Assessment Protocols (CAPs) – For Use With interRAI's Community and Long-Term Care Assessment Instruments*. Version 9.1. Washington DC: interRAI.
- Oliver D, Healey F, Haines TP. 2010. Preventing falls and fall-related injuries in hospitals. *Clinics in Geriatric Medicine* 26(4): 645–92.
- Peel NM, Kassulke D, McClure RJ. 2002. Population based study of hospitalised fall related injuries in older people. *Injury Prevention* 8(4): 280–3.
- Pieracci FM, Eachempati SR, Shou J, et al. 2007. Use of long-term anticoagulation is associated with traumatic intracranial hemorrhage and subsequent mortality in elderly patients hospitalized after falls: analysis of the New York State Administrative Database. *Journal of Trauma and Acute Care Surgery* 63(3): 519–24.
- 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.
- Rubenstein LZ. 2006. Falls in older people: epidemiology, risk factors and strategies for prevention. *Age and Ageing* 35(suppl 2): ii37–ii41.
- Schepens S, Sen A, Painter JA, et al. 2012. Relationship between fall-related efficacy and activity engagement in community-dwelling older adults: a meta-analytic review. *American Journal of Occupational Therapy* 66(2): 137–48.
- Stevens JA, Mahoney JE, Ehrenreich H. 2014. Circumstances and outcomes of falls among high risk community-dwelling older adults. *Injury Epidemiology* 1(1): 1–9.
- Studer P, Suhm N, Zappe B, et al. 2013. Pubic rami fractures in the elderly – a neglected injury. *Swiss Medical Weekly* 143: w13859.
- Thim T, Krarup N, Grove EL, et al. 2012. Initial assessment and treatment with the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach. *International Journal of General Medicine* 5: 117–21.
- World Alliance for Patient Safety. 2005. WHO guidelines for adverse event reporting and learning systems. URL: <https://apps.who.int/iris/handle/10665/69797> (accessed 4 May).

**LIVE STRONGER
FOR LONGER**

PREVENT FALLS & FRACTURES