Guidebook for Preventing Falls and Harm From Falls in Older People: Australian Community Care

A Short Version of Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Community Care

2009

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

ACSQHC was established in January 2006 by the Australian health ministers to lead and coordinate improvements in safety and quality in Australian health care.

Copies of this document and further information on the work of ACSQHC can be found at http://www.safetyandquality.gov.au or obtained from the Office of the Australian Commission on Safety and Quality in Health Care on telephone +61 2 9263 3633 or email to mail@safetyandquality.gov.au.

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Guidebook for Preventing Falls and Harm From Falls in Older People: Australian Community Care

A Short Version of *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Community Care 2009*

The Australian Commission on Safety and Quality in Health Care (ACSQHC) has developed three separate falls prevention guidelines, with the help of older Australians, for older Australians:

- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Community Care 2009*
- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals 2009*
- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Residential Aged Care Facilities 2009*.

Collectively, the guidelines are referred to as the Falls Guidelines.

The Falls Guidelines are based on current and relevant literature. They identify principles of care and special considerations for culturally and linguistically diverse, Indigenous, and rural and remote groups.

The Falls Guidelines use evidence based recommendations, good practice points, case studies and points of interest to facilitate understanding and promote implementation.

There is a need for further research to establish the effects of interventions on falls rates. Therefore, the Falls Guidelines recognise that the sound clinical judgment of informed professionals is best practice in situations where strong recommendations have not been made.

This abridged version of *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Community Care 2009* is designed as a quick reference tool, targeted specifically for use in community settings — that is, private homes in which older people are receiving care, but also including low-acuity community health centres. The guidelines are intended to guide clinical practice and to help health professionals to develop and implement practices to prevent falls and injuries from falls.

The full guidelines for Australian community care are a more comprehensive resource and should be referred to when implementing a falls prevention program.

Support resources

Other resources available from http://www.safetyandquality.gov.au:

- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Community Care*
- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals 2009*
- *Guidebook for Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals*
- *Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Residential Aged Care Facilities 2009*
- *Guidebook for Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Residential Aged Care Facilities*
- *Implementation Guide for Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals and Residential Aged Care Facilities 2009*
- Fact sheets
  - Falls facts for patients and carers
  - Falls facts for doctors
  - Falls facts for nurses
  - Falls facts for allied health professionals
  - Falls facts for support staff (cleaners, food services and transport staff)
  - Falls facts for health managers.

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Acronyms

ACSQHC	Australian Commission on Safety and Quality in Health Care
BPPV	benign paroxysmal positional vertigo
DMMR	domiciliary medication management review
GP	general practitioner
IU	international unit
(OH)D	hydroxyvitamin D
VR	vestibular rehabilitation

1 Background

Key messages of the guidelines

- Many falls can be prevented.
- Fall and injury prevention needs to be addressed at the point of care and from a multidisciplinary perspective.
- Managing many of the risk factors for falls (eg delirium or balance problems) will have wider benefits beyond falls prevention.
- Engaging older people themselves is an integral part of preventing falls and minimising harm from falls.
- Best practice in fall and injury prevention includes implementing falls prevention strategies, identifying falls risk, and implementing targeted individualised strategies that are resourced adequately, and monitored and reviewed regularly.
- Multifactorial interventions (ie a combination of interventions tailored to the individual) are effective for reducing the rate of falls in the community setting.
- In the community setting, some single interventions (eg certain exercise programs and home safety programs in high-risk subgroups, and vitamin D with calcium supplementation for older people with low blood levels) can reduce falls and the number of fallers.
- The consequences of falls that result in minor or no injury are often neglected. Factors such as fear of falling and reduced activity level can profoundly affect function and quality of life, and increase the risk of seriously harmful falls.
- At a strategic level, there will be a time lag between investment in a falls prevention program and improvements in outcome measures.

1.1 What is a fall?

The World Health Organization defines a *fall* as 'an event which results in a person coming to rest inadvertently on the ground or floor or other lower level'.†

An *injurious fall* is a fall that causes a fracture to the limbs, hip or shoulders, or one that causes a traumatic brain injury.

† http://www.who.int/violence_injury_prevention/other_injury/falls/links/en/index.html

1.2 What is an intervention?

An *intervention* is a therapeutic procedure or treatment strategy designed to cure, alleviate or improve a certain condition. Interventions can be in the form of medication, surgery, early detection (screening), dietary supplements, education or minimisation of risk factors.

In falls prevention, interventions can be:

- targeted at single risk factors — *single interventions*
- targeted at multiple risk factors
  - *multiple interventions* — where everyone receives the same, fixed combination of interventions
  - *multifactorial interventions* — where people receive multiple interventions, but the combination of these interventions is tailored to the individual, based on an individual assessment.

1.3 Development of the Falls Guidelines

The Falls Guidelines were developed by a multidisciplinary expert panel (the Falls Guidelines Review Expert Advisory Group). Whenever necessary, the expert panel accessed resources outside its membership. An additional external quality reviewer was appointed to review the guidelines from an Australian perspective.

The Falls Guidelines also drew on the following sources of information:

- the previous version of the guidelines
- a search of the most recent literature for each risk factor or intervention (see Section 1.3.1)
- the most recent Cochrane review of falls prevention interventions in the community setting
- feedback from health professionals and policy staff implementing the previous guidelines
- clinical advice from the expert advisory group
- guidance from external expert reviewers
- guidance from international external expert reviewers
- guidance from specialist groups (such as the Royal Australian College of General Practitioners, Australian Association of Gerontology and Continence Foundation of Australia).

1.3.1 Levels of evidence

Papers that were retrieved from the literature review were classified using the National Health and Medical Research Council's six-point rating system. This system identifies the strength of evidence based on the specific methods used in the paper.

Table 1.1 National Health and Medical Research Council levels of evidence

Level	Description
I	Evidence obtained from a systematic review of all relevant randomised controlled trials
II	Evidence obtained from at least one properly designed randomised controlled trial
III-1	Evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)
III-2	Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case–control studies, or interrupted time series with a control group
III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group
IV	Evidence obtained from case series, either post-test, or pretest and post-test

Source: NHMRC[1]

Evidence based recommendations

- Evidence based recommendations are presented in boxes at the start of each section, accompanied by references. They were selected based on the best evidence and accepted by the project's expert advisory group and external quality reviewers.
- Where possible, separate recommendations for assessment and interventions are given. Assessment recommendations have been developed by the expert group based on current practice and a review of the literature discussed in the text of each section.
- Intervention recommendations are based on a review of the research on the use of the intervention. Each recommendation is accompanied by a reference to the highest quality study upon which it is based, as well as a level of evidence.

Recommendations based on evidence nearer the **I** end of the scale should be implemented, whereas recommendations based on evidence nearer the **IV** end of the scale should be considered for implementation on a case-by-case basis, taking into account the individual circumstances of the older person.

The highest level of evidence for an intervention is reported regardless of the setting; however, when the research setting is not the community, an * is added to the level (eg Level I-*). This shows that caution is needed when applying economic implications for that recommendation to the community setting.

Good practice points

- Good practice points have been developed for practice where there have not been any studies; for example, where there are no studies assessing a particular intervention, or where there are no studies specific to a particular setting. In these cases, good practice is based on clinical experience or expert consensus.

Point of interest

These boxes indicate points of interest. Most points of interest were revealed by the Australia-wide consultation process or from grey literature (unpublished conference proceedings, etc).

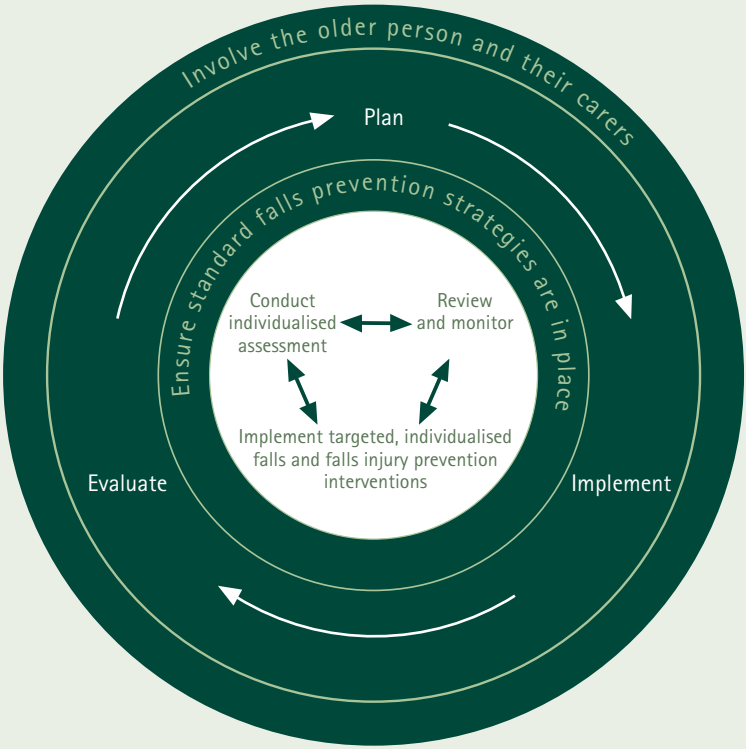
Case study

These boxes indicate case studies. The case studies provide information on likely scenarios, which are used as illustrative examples.

1.4 How to use the guidelines

This quick reference guide is intended for use as a supplementary resource to the Falls Guidelines. Figure 1.1 illustrates how to use the guidelines to prevent falls and falls injuries. Involvement of the older person and their carers is necessary at all stages.

At a strategic level, a falls prevention program needs planning, implementation and evaluation as represented by the outer circle in Figure 1.1. The inner circle represents standard falls prevention strategies that are implemented at the individual or point-of-care level (see Parts B-D of the Falls Guidelines). Individualised assessment, targeted and individualised interventions, and continuous review and monitoring are recommended (see Chapters 4 and 5 of the Falls Guidelines).



Plan

Plan for implementation

Step 1: Identify teams
Step 2: Identify, consult, analyse and engage key stakeholders
Step 3: Assess organisational readiness
Step 4: Analyse falls

Plan for evaluation

Step 5: Establish a baseline

Plan for quality improvement

Step 6: Review current clinical practice

Implement

Step 7: Decide on implementation approaches
Step 8: Determine process for implementation
Step 9: Conduct trial
Step 10: Learn from trial
Step 11: Proceed to widespread implementation for improvement
Step 12: Sustain implementation

Evaluate

Step 13: Measure process
Step 14: Measure outcomes
Step 15: Report and respond to results

Figure 1.1 Using the guidelines to prevent falls in Australia

2 Involving the older person and their carers

Good practice point

- The participation of the older person in their own health care is central to high-quality and accountable health services. It also encourages shared responsibility in health care. The older person can help facilitate change in health care practices.

Health care professionals should consider the following things to encourage older people to participate in falls prevention:

- Make sure the falls prevention message is presented within the context of people staying independent for longer.[2]
- Be aware that the term 'falls prevention' could be unfamiliar and the concept difficult to understand for many people in this age group.[2]
- Provide relevant and user-friendly information to allow older people and their carers to take part in discussions and decisions about preventing falls[3] (see the fact sheets on preventing falls).
- Find out what changes an older person is willing to make to prevent falls, so that appropriate and acceptable recommendations can be made.[3]
- Offer information in languages other than English, where appropriate;[3] however, do not assume literacy in the older person's own language.
- Explore the potential barriers that prevent older people from taking action to reduce falls (such as low self-efficacy and fear of falling) and support older people to overcome these barriers.[3]
- Develop falls prevention programs that are flexible enough to accommodate the older person's needs, circumstances and interests.[3]
- Ask the older person's family to help in falls prevention strategies.
- Trial a range of interventions with the older person.[4]

3 Standard falls prevention strategies

3.1 Falls prevention interventions

Recommendations

Intervention

- Use effective interventions to reduce falls in the community, for example certain exercise programs, assessment followed by multifactorial treatment, home safety interventions in high-risk groups, and academic detailing for general practitioners by a pharmacist. (Level I)[5]

Single interventions

- Older people should be encouraged to exercise to prevent falls. Certain programs have been shown to be effective and largely focus on balance training. (Level I)[5,6]
- Older people with visual impairment primarily related to cataracts should undergo cataract surgery as soon as practicable. (Level II)[7,8]
- When conducted as a single intervention, home environment interventions are effective for reducing falls in high-risk older people. (Level I)[9]
- For individual older people, gradual and supervised withdrawal of psychoactive medications should be considered to prevent falls. (Level II)[10]
- People with severe visual impairment should receive a home safety assessment and modification program specifically designed to prevent falls. (Level II)[11,12]
- Use cardiac pacing in older people who live in the community, and who have carotid sinus hypersensitivity and a history of syncope or falls, to reduce the rate of falls. (Level II)[13]
- Collaborative review and modification of medication by general practitioners and pharmacists, in conjunction with individual patients, is recommended to prevent falls. (Level II)[14]
- Vitamin D and calcium supplementation should be recommended as an intervention strategy to prevent falls in older people who live in the community, particularly if they are not exposed to the minimum recommended levels of sunlight. Benefits from supplementation are most likely to be seen in people who have vitamin D insufficiency (25(OH)D <50 nmol/L) or deficiency (25(OH)D <25 nmol/L). (Level I)[5] (Level I-*)[15]

Multiple interventions

- The combination of exercise targeting strength and balance, education and home safety intervention (the Stepping On Program) is recommended to reduce the rate of falls in older people who live in the community. (Level I)[9]

Multifactorial interventions

- In older people at risk of falls, individualised assessment leading directly to tailored interventions is recommended. (Level I)[5]

Good practice points

- The general practitioner can 'prescribe' verbal or written instructions for falls prevention interventions (eg exercise programs) for the older person to improve or maintain independence, and encourage adherence.
- Managing many of the risk factors for falls (eg balance problems, medication) will have wider benefits beyond falls prevention.

3.1.1 Single interventions

The following sections describe interventions that reduce the rate or risk of falling, when used as single interventions.

Exercise interventions

Several different types of exercise programs can reduce both the rate of falls and the risk of falling in older people living in the community;[5] for example:

- *home-based balance and strength training* (eg the Otago Exercise Programme)[16,17] — this program is an individually prescribed home exercise program comprising balance retraining, lower limb muscle strengthening and walking components
- *group-based tai chi*[18-21] — this has reduced falls in some trials involving a general population of older people,[20] but not in other trials involving transitionally frail older people, indicating that group tai chi classes may be more beneficial in the less frail older population[22]
- *other group exercise programs*[23-28] — exercise programs that challenge balance and include frequent exercise reduce falls rates more than programs without these features.[6]

Both group and individual exercise programs can prevent falls. It is likely that some people will be more willing and able to exercise with others at a centre and other people would prefer a home setting. A strategy to achieve ongoing exercise may combine supervised group exercise with initial, interspersed or follow-on home exercise programs.

To be effective, exercise programs need to have a component that challenges balance and a higher total dose of exercise.[6] There is also evidence that detraining occurs and benefits are lost when exercise programs finish, so a maintenance component is important when planning an exercise program.[29]

See Section 4.2 for more information on exercise interventions.

Targeting falls prevention exercise programs

Exercise programs can prevent falls when they are aimed at the general community, as well as when they are targeted at people who have an increased risk of falls. Greater relative reductions in fall rates have occurred in trials with broader inclusion criteria than in studies that only included people at high risk of falls.[5] This provides support for a population-based approach to falls prevention with appropriate exercise programs.

However, the consequences of falls (such as injuries and reduced activity levels) may have a greater impact in higher risk populations. Appropriate exercise programs for falls prevention should be carefully targeted at subgroups at high risk and also offered to the general, older community.

Vitamin D supplementation

The effect of vitamin D on falls in older people is unclear.[5,30,31] Vitamin D analogues (eg calcitriol) may be useful for preventing falls, but are also associated with adverse effects, such as hypercalcaemia.

Vitamin D does help to prevent fractures,[32] and there is also a strong association between vitamin D deficiency and neuromuscular function.[33] Therefore, the use of vitamin D has been well supported in the older population due to the high rate of vitamin D deficiency, particularly in those in long-term care (see Section 5.2 for more information).

Medication review and withdrawal

Gradual withdrawal of psychoactive medications can reduce falls in older people living in the community who take these medications regularly.[10] However, it can be difficult to maintain older people without psychoactive medications once these medications have been prescribed. The preferred approach is to avoid prescribing psychoactive drugs if possible and appropriate for the older person, their medical condition and their social situation. See Section 4.8 for more information on medication interventions.

Cardiac pacemaker insertion

Treating cardioinhibitory carotid sinus sensitivity with a pacemaker in people aged 50 years or older can reduce the rate of falls.[13] However, cardioinhibitory carotid sinus sensitivity is not a common cause of falls. Carotid sinus syndrome should be considered in the presence of syncope associated with a fall, or when the cause of the fall is unexplained (see Section 4.6 for more information).[29]

Home safety programs

Trials of home safety programs have had mixed results in preventing falls.[5,9] Offering home safety as a single intervention has the greatest effect when provided to older people at high risk. Strategies to improve adherence to environmental recommendations should be considered, and it is important to help the older person understand the relevance of any modifications (see Section 4.10 for more information).

Some older people will have impaired vision that cannot be corrected. A home safety assessment and modification program designed for older people with low vision can significantly reduce the rate of falls in people with severe visual impairment.[11]

Improving vision

Cataract surgery

Expedited cataract surgery reduces the rate of falls compared with remaining on a standard 12-month waiting list.[8]

Vision assessment and eye examination

Vision interventions (eg referral to eye care practitioners when impaired vision is detected) can reduce the risk of falling; however, the risk of falling is reduced further when vision interventions are combined with exercise

and home hazard management interventions, supporting the use of vision assessment and referral as part of a multifactorial approach to falls prevention.[34]

Large changes in visual correction (ie >0.75 diopter) may increase the risk of falls, because frail, older people may need a considerable period of time to adapt to their updated prescriptions, or because they may adopt more risk-taking activities (thus increasing their exposure to falls) after vision improvements.[35] Therefore, when updating an older person's spectacle prescription, eye care professionals should prescribe conservatively and help the older person to understand they need to be careful while adapting to changes in their spectacles. See Section 4.9 for more information on vision interventions.

3.1.2 Multiple interventions

Multiple interventions can be used both as an individual and a public health approach to falls prevention.[5,36]

Falls prevention programs, which often take the form of group learning sessions run by community organisations, can reduce the rate of falls in the community setting. An ad hoc approach may not be effective, and therefore not cost effective in preventing falls, so these community organisations should consider following well-developed programs, such as the Stepping On program.

The Stepping On program

The Stepping On program emphasises behaviour change to avoid falls. The program includes sessions on falls risk appraisal, exercise, home hazards, strategies to move around the local community, safe footwear, vision as a risk factor for falls, vitamin D, hip protectors, medication management, mastering safe mobility, and a home visit to follow through the falls prevention strategies and activities, and to assist with home adaptations and modifications if required. A booster session is held after three months.

The Stay On Your Feet program

A concerted population approach to falls prevention will reduce health care use and costs.[37,38] The Stay On Your Feet program in Queensland includes community-based activities aimed at older people (≥55 years).[37] The program addresses falls risk factors, such as balance and gait problems, insufficient exercise, inappropriate footwear, poor vision, medication use, underlying medical conditions and environmental hazards.

3.1.3 Multifactorial interventions

Multifactorial interventions involve assessing an individual's risk of falling, and then arranging referral or providing direct treatment to reduce these risks. Multifactorial interventions are effective in reducing the rate of falls but do not have a significant effect on the risk of falling in older people living in the community.[5]

The effectiveness of multifactorial interventions may be sensitive to differences between health care systems and networks at both local and national levels. Multifactorial interventions form the basis of many falls prevention services, but the interventions examined in randomised controlled trials are complex, and their effectiveness may depend on factors yet to be determined.

3.1.4 Multifactorial versus single interventions

Since most falls occur as a result of a combination of factors, the benefits of multifactorial interventions should be greater, in theory, than single interventions. However, single intervention approaches are just as effective in reducing falls as multifactorial prevention programs.[39]

There is a risk that older people may become confused or be offered conflicting advice when several interventions are attempted.[11,40] Therefore, when multicomponent interventions are delivered, they should be done so in a staged and integrated manner.

The multifactorial approach also makes it difficult to evaluate the relative effects of different programs and their components in clinical trials. Factorial designs and single intervention studies are vital in this regard, because they help to establish which components of the multicomponent packages are effective. Multifactorial interventions should comprise two or more single intervention strategies that have been demonstrated to be effective in trials, or an actual combination of interventions shown to be effective.

4 Management strategies for common falls risk factors

4.1 Falls risk screening and assessment

Recommendations

Screening and assessment

- Older people should be asked about falls at least once each year by their general practitioner or other health care provider.
- Older people with a history of one or more falls in the past year should be assessed using a simple, validated balance test or falls risk screening.
- Older people who perform poorly on a simple test of balance or gait, or on a falls risk screening tool, should undergo a detailed assessment to identify contributory risk factors.
- Falls risk screening and assessment tools used should be evidenced based (meaning that they have demonstrated good predictive accuracy, and have been evaluated in the relevant setting in more than one site).
- Falls prevention interventions may need to be modified to make sure they are suitable for the individual, and often the carer or family members will also play an important role in implementing falls prevention actions.

Good practice points

Falls risk screening

- Falls risk screening should be used to guide more detailed assessment and intervention, and the outcomes of the screening should be documented and discussed with the older person and their carer(s).
- When the threshold score of a screening tool is exceeded, a falls risk assessment should be conducted as soon as practicable. If the score is not exceeded, standard falls prevention strategies apply.

Falls risk assessment

- To develop an individualised plan for preventing falls, health care professionals need to identify systematically and comprehensively the factors contributing to the older person's increased risk of falling.
- Interventions delivered as a result of the assessment provide benefit rather than the assessment itself; therefore, it is essential that interventions address the risk factors identified systematically.
- Identifying the presence of cognitive impairment should form part of the falls risk assessment process.

4.1.1 Falls risk screening

Falls risk screening is a brief process of estimating a person's risk of falling, which then classifies them as being at either low or increased risk. Falls risk screening usually involves reviewing up to five items. Although not designed as a comprehensive assessment, positive screening on certain screen items can also provide information about intervention strategies. When a falls risk screening is conducted, it needs to be supported with education and intermittent reviews to ensure appropriate and consistent use of relevant interventions.

The simplest falls risk screening tool that can easily be incorporated into routine care should record the older person's history of falls in the past 12 months, and their balance and mobility status. Alternatively, a multiple-item screening tool can be used.[41] These tests and screens are summarised in the following sections.

History of falls in past 12 months

At least once a year, the general practitioner (GP) should ask all older people (or their carers) about any falls they have experienced.[41] The GP should also take a detailed history of the events surrounding the fall(s). This role could also be undertaken by other health professionals who provide care to older people living at home.

Balance and mobility performance

The American and British geriatrics societies recommend that all older people who report one or more falls in the preceding year should be assessed on the Timed Up and Go Test as a simple screening test to identify whether more detailed assessment of gait and balance is warranted (see Table 4.1).[41]

The Sit-to-Stand and Alternate Step tests also have demonstrated validity, reliability and feasibility as falls risk screens in the community setting.[42] The Sit-to-Stand Test is a measure of lower limb strength, speed and coordination (see Table 4.1). The Alternate Step Test provides a measure of lateral stability and involves the time taken to complete eight steps onto a step, alternating between left and right feet, as fast as possible (see Table 4.1).

Multiple-item screening tools

Other validated falls risk screening tools contain multiple items. For example, the Elderly Fall Screening Test and the Falls Risk for Older People (community version) (FROP-Com Screen)[43,44] contain three to five common risk factors that, in combination, can identify with reasonable accuracy those older people who have an increased risk of falling (see Table 4.1).

If any item on a multiple risk factor screening is identified as being 'at risk', interventions should be considered for that risk factor — even if the person has a low falls risk score overall. For example, if a person scores an overall score of two on the FROP-Com screen (consisting of a score of zero for a previous fall, two for balance and mobility, and zero for a change in activities of daily living), they would have a low risk of falling overall. However, a preventive approach would use an intervention to address their mild balance impairment at this time.

Table 4.1 lists validated tests and tools that are available for falls risk screening.

Table 4.1 Screening tools

Timed Up and Go Test (TUG)[45-47]	
Description	TUG measures the time taken for a person to rise from a chair, walk three metres at normal pace with their usual assistive device, turn, return to the chair and sit down.
Time needed	1–2 minutes
Criterion	A time of ≥12 seconds indicates increased risk of falling

Sit-to-Stand Test (STS)[42]	
Description	STS provides a measure of lower limb strength, speed and coordination. It involves the time taken to complete five STSs as fast as possible from a standard height (43 cm) chair.
Time needed	1–2 minutes
Criterion	A time of ≥12 seconds indicates increased risk of falling

Alternate Step Test (AST)[42]	
Description	AST provides a measure of lateral stability and involves the time taken to complete eight steps, alternating between left and right foot, as fast as possible onto a step that is 19 cm high and 40 cm deep.
Time needed	1–2 minutes
Criterion	A time of ≥10 seconds indicates increased risk of falling

FROP-Com Screen[44]	
Description	FROP-Com Screen is a three-item falls risk screening tool, developed from the FROP-Com assessment tool. The three items are a history of falls in the past 12 months; observations of steadiness while standing up, walking three metres, turning returning to the chair and sitting down; and self reporting of the need for assistance in performing domestic activities of daily living.
Time needed	1–2 minutes
Criterion	A score of >3 indicates increased risk of falling

4.1.2 Falls risk assessment

Assessing falls risk typically involves either the use of multifactorial assessment tools that cover a wide range of falls risk factors; or functional mobility assessments that focus on the physiological and functional domains of postural stability, including vision, strength, coordination, balance and gait. When identifying the cause of a fall, it is also important to remember that most falls occur as a result of an interaction between intrinsic and extrinsic factors, and that multiple factors increase the risk of falls.[48] Many disease processes that are more common in older people increase the risk of falls, mainly through impairing postural stability. Assessment tools provide detailed information on the underlying deficits contributing to overall risk and should be linked to intervention and management. Most falls risk assessments also classify people into low and high falls risk groups.

Several falls risk assessment tools are now available for use in community settings. However, when selecting a tool, it is important to check whether it has been validated prospectively and preferably in more than one site.[49,50] Table 4.2 lists some recommended falls risk assessment tools that have demonstrated applicability to Australian community care.

Table 4.2 Falls risk assessment tools

QuickScreen[42]	
Description	QuickScreen is a risk assessment tool designed for use by practice and rural nurses, allied health workers and general practitioners. It is based on the sensorimotor functional model for falls prediction. It allows the clinician not only to estimate the level of increased falls risk, but also to determine which sensorimotor systems are impaired. This provides an opportunity to link assessment with evidence based, tailored interventions. The QuickScreen consists of the following measures: previous falls, medication use, vision, peripheral sensation, lower limb strength, balance and coordination. The falls assessment requires minimal equipment: a low-contrast eye chart, a filament for measuring touch sensation, and a small step. There is a cost associated with the purchase of QuickScreen. Details about QuickScreen can be found at http://www.powmri.edu.au/research/facilities/falls-and-balance-research-group/quickscreen
Time needed	10 minutes
Criterion	A score of 4 or more indicates an increased risk of falling

FallScreen – Physiological Profile Assessment[51]	
Description	FallScreen is a validated risk assessment tool that can be linked to evidence based approaches to interventions. It provides detailed quantitative information on the physiological domains contributing to postural stability. FallScreen contains five items: an assessment of vision, peripheral sensation, lower limb strength, reaction time and body sway (short version), and more detailed assessment on these items (long version). There is a cost associated with the purchase of FallScreen. Details about FallScreen can be found at http://www.powmri.edu.au/health/falls-balance
Time needed	15–20 minutes (abbreviated version)
Criterion	A score of 1 or more indicates an increased risk of falling

FROP-Com (Falls Risk for Older People – community version)[44]	
Description	FROP-Com is a detailed falls risk assessment tool. It includes 13 risk factors in 26 questions with either dichotomous (0–1) or ordinal (0–3) scoring. A total of these individual scores provides an overall score of falls risk (range 0–60), with higher scores indicative of greater risk. The tool includes guidelines on scoring each risk factor, and evidence based referral or interventions. No special equipment is required. The full FROP-Com and its guidelines are available at http://www.mednwh.unimelb.edu.au/research/research_falls_service.htm
Time needed	10–15 minutes
Criterion	A score >18 indicates a high risk of falls

Falls risk assessments can be performed by a GP or other health professional. Based on the assessment outcome, these assessors might refer to other health professionals for more detailed assessment and management of identified risk factors; for example, a referral to an ophthalmologist for a detailed vision assessment for people with impaired vision, or a referral to a physiotherapist or exercise physiologist for a more detailed assessment of balance and mobility if the older person scores poorly in these areas. Most risk assessment tools focus on intrinsic falls risk factors only, so a separate environmental assessment may be indicated to identify extrinsic falls risk factors.

The outcomes of the falls risk assessment, together with the recommended strategies to address identified risk factors, need to be documented and reported to other health care staff, and discussed with the older person and where applicable with their carer(s).

Case study

Mrs D went to her general practitioner (GP) after a fall. She had bruised her hip and was concerned it was broken. The GP asked whether she had fallen on other occasions in the past year, which Mrs D confirmed. The GP discussed the circumstances of her falls, which she reported included several trips both inside and outside the home, and a sense that her balance had progressively worsened. The GP assessed Mrs D using the Timed Up and Go Test, which she completed in 16 seconds. The practice nurse administered the QuickScreen assessment, which identified Mrs D was taking a benzodiazepine, and performed poorly in the Sit-to-Stand and Alternate Step tests. The GP reviewed and modified Mrs D's medications (including weaning her off the use of the benzodiazepine medication), and referred Mrs D for a physiotherapy assessment to prescribe an exercise program. An occupational therapy assessment was also organised to review home safety and consider functional needs at home. Six months later, Mrs D was taking part in a community strength and balance exercise program and had resumed her previous activities. She had regained confidence in her outdoor mobility, and had experienced no further falls.

4.2 Balance and mobility limitations

Recommendations

Assessment

- Use assessment tools to:
  - quantify the extent of balance and mobility limitations, and muscle weaknesses
  - guide exercise prescription
  - measure improvements in balance, mobility and strength
  - assess whether the older person has a high risk of falling.

Intervention

- Deliver exercise programs to prevent falls in older people who live in the community (eg group exercise classes, home-delivered strength and balance retraining, tai chi classes). (Level I)[5]
- Improve the effectiveness of exercise programs for preventing falls by including challenging balance training and frequent, ongoing exercise. (Level I)[5,6]
- Encourage exercise for falls prevention in all older people in the community, not only those who have an increased risk. (Level I)[5,6]

4.2.1 Assessing balance, mobility and strength

Many different approaches can be used to assess balance, mobility and muscle strength in older people. Some of the clinical assessments that may be of use are outlined in Table 4.3. The choice of tool depends on the time and equipment available and the level of ability of the people being assessed.

Table 4.3 Tools for assessing balance, mobility, strength and gait

Test	Description	Time to complete (minutes)	Level that is predictive of falls
Tools for assessing balance			
Postural sway and leaning balance tests[51]	As part of the Physiological Profile Assessment (PPA), sway is measured using a swaymeter that measures displacements of the body at waist level. During standing balance tests, the person has to stand as still as possible for 30 seconds, with eyes open and closed, once on the floor and once on a piece of medium-density foam rubber (15 cm thick). During leaning balance tests, the person has to lean forward and backwards as far as possible, or follow a track.	5–10	Part of the PPA[51]

Test	Description	Time to complete (minutes)	Level that is predictive of falls
Tools for assessing balance			
Functional reach[52]	Functional reach is a measure of balance and is the difference between a person's arm length and maximal forward reach, using a fixed base of support. Functional reach is a simple and easy-to-use clinical measure that has predictive validity in identifying recurrent falls.	1–2	≤10 inches
Alternate Step Test (AST)[42]	AST is a measure of lateral stability. It involves the time taken to complete eight steps, alternating between left and right foot, on to a step of 19 cm high and 40 cm deep, as fast as possible.	1–2	10 seconds
Tools for assessing mobility			
Six-Metre Walk Test (SMW)[42]	SMW measures a person's gait speed in seconds along a corridor (over a distance of 6 metres) at their normal walking speed.	1–2	6 seconds
Timed Up and Go Test (TUG)[53]	TUG measures the time taken for a person to rise from a chair, walk 3 metres at normal pace and with their usual assistive device, turn, return to the chair and sit down.	12	15 seconds

Test	Description	Time to complete (minutes)	Level that is predictive of falls
Tools for assessing strength			
Sit-to-Stand Test (STS)[54]	STS is a measure of lower limb strength and is the time needed to perform five consecutive chair stands from a seated position.[54]	1–2	12 seconds
Spring balance[51]	As part of the PPA, the strength of three leg muscle groups (knee flexors and extensors and ankle dorsiflexors) is measured while participants are seated. In each test, there are three trials and the greatest force is recorded.	5	Part of the PPA[51]
Scales for assessing balance and gait			
Berg Balance Scale[55]	The Berg Balance Scale is a 14-item scale designed to measure balance of the older adult in a clinical setting with a maximum total score of 56 points (http://www.chcr.brown.edu/geriatric_assessment_tool_kit.pdf).	15–20	≤40
Tinetti Performance-Oriented Mobility Assessment tool[56]	The Tinetti Performance-Oriented Mobility Assessment tool measures a person's gait and balance. It is scored on the person's ability to perform specific tasks with a maximum total score of 28 points.	10–15	≤24

Test	Description	Time to complete (minutes)	Level that is predictive of falls
Scale for assessing confidence and falls efficacy[57]			
Falls Efficacy Scale International	The Falls Efficacy Scale International provides information on level of concern on a four-point scale (1 = not at all concerned, to 4 = very concerned) across 16 activities of daily living (eg cleaning the house, simple shopping, walking on uneven surfaces).	5	Score ≥23 indicates high level of concern

4.2.2 Providing exercise interventions

Effective exercise programs for preventing falls mainly comprise challenging and progressive balance exercises. The exercise program should be tailored to the existing levels of fitness and targeted to the older person's particular deficits and lifestyle. If possible, exercises should be conducted in weight-bearing positions to obtain optimal benefits.

Challenging balance safely

To improve balance, an exercise program needs to be challenging yet safe. To ensure a sufficient challenge to balance, the program should aim to include:

- exercise in a standing position
- minimal upper limb support (minimise the use of rails or chairs for support while exercising; however, it is useful for older people to exercise near supportive objects so they can steady themselves when necessary)
- a minimal base of support (ie exercise that involves standing or walking with the feet closer together or standing on one leg)
- controlled movements of the body's centre of mass, such as stepping, reaching or dancing.

Exercises that challenge balance could lead to falls themselves; therefore, they need to be carefully prescribed, set up in a safe way

(eg next to a wall or counter for hand support as required) and supervised if necessary. This is particularly important for frailer older people.

Dose of exercise

The optimum duration and frequency of exercise programs to prevent falls is not yet known. A systematic review found that exercise programs prevented more falls if they included at least two hours of exercise each week over a 25-week period.[5] However, it is likely that effects of exercise are lost once exercise stops;[58] therefore, ongoing exercise is probably required for ongoing effects on fall rates. Research into other benefits of exercise has often found that there is a dose–response relationship — that is, greater effects are seen with more exercise.[58,59] This may also be the case for falls prevention.

Walking programs and falls prevention

Walking is a popular form of exercise and can provide the many health benefits associated with increased physical activity levels.[58] However, the role of walking programs in falls prevention is unclear, because there is some evidence that including walking is associated with reduced effects on falls prevention[5] and possibly an increase in falls rates.[60,61]

Table 4.4 lists the features that an exercise program should include to be effective for reducing falls.

Table 4.4 Features that should be included in exercise programs

Feature	Description
Program	The core of the exercise program should be balance training (preferably in weight-bearing positions) that aims to reduce the amount of support. Additionally, the exercise program can include components of: • moderate-intensity resistance training • endurance exercise to increase general fitness (not a walking program on its own).
Modalities	Exercise programs should be designed or delivered by a trained professional (ie physiotherapist) to ensure the exercises are challenging yet safe.
Intensity	Individually prescribed and progressive (the instructor must be sensitive to fatigue levels of individual participants and tailor the intensity of the program accordingly).
Setting	Individual or group
Duration of program	Ongoing exercise

4.2.3 Including all older people

Exercise is generally safe and beneficial for older people, even those with chronic health problems. However, exercise may be unsafe for a minority of people with particular medical conditions. Therefore, before starting an exercise program, older people should be screened to assess whether they need medical clearance before exercising.[62] Older people with health problems that affect their ability to exercise safely might be more likely to require guidance from a health professional or other qualified exercise leader when starting a new exercise program.

Case study

Mrs T is 83 years old and presented to her general practitioner (GP) with bruises after she tripped while walking down some steps. On further questioning, her GP discovered this was her third fall in the past year. The two earlier falls also happened when she tripped while outside. As a result, Mrs T goes outside far less frequently. The GP observed some unsteadiness in her walking and turning, and referred Mrs T to a physiotherapist for a balance assessment. The physiotherapist assessed Mrs T's performance using the Timed Up and Go Test and the functional reach test and saw she had a high risk of future falls. The physiotherapist explained how she would benefit from a well-designed exercise program to improve her balance and general wellbeing, but also to prevent future falls. The physiotherapist initially referred Mrs T to a supervised group balance and strength program. At a later stage, Mrs T could progress to self-directed exercise, although she may prefer to continue to exercise with other people to maintain motivation.

4.3 Cognitive impairment

Recommendations

Assessment

- Older people with cognitive impairment have an increased risk of falls and should have their falls risk factors assessed.

Intervention

- Identified falls risk factors should be addressed as part of a multifactorial falls prevention program, and injury-minimisation strategies (such as using hip protectors or vitamin D and calcium supplementation) should be considered. (Level I-*)[15]

Note: there is no evidence that falls can be reduced in older people with cognitive impairment living in the community.[5] See the residential aged care facilities guidelines for further information on providing treatment to older people with cognitive impairment.

Good practice points

- Older people presenting with an acute change in cognitive function should be assessed for delirium and the underlying cause of this change.
- Older people with gradual onset, progressive cognitive impairment should undergo detailed assessment to determine diagnosis, and where possible, reversible causes of the cognitive decline. Reversible causes of acute or progressive cognitive decline should be addressed and treated.
- If an older person with cognitive impairment does fall, reassess their cognitive status, including presence of delirium (eg using the Confusion Assessment Method tool).
- Interventions shown to work in cognitively intact populations should not be withheld from cognitively impaired populations; however, interventions for older people with cognitive impairment may need to be modified and supervised, as appropriate.

4.3.1 Assessing cognitive impairment

Older people with cognitive impairment have an increased risk of falls, and risk factors for falls are more prevalent in older people with cognitive impairment than in people without cognitive impairment. Therefore, one of the most important initial steps in preventing falls in older people is to assess for cognitive impairment. In the absence of specific trial data to show that it is possible to prevent falls in people with cognitive impairment, the following suggestions for care reflect good clinical practice.

GPs can use the following steps to assess for the presence of cognitive impairment:

- Assess for the presence of dementia or delirium and treat possible medical conditions that may contribute to an alteration in cognitive status. Rapid diagnosis and treatment of a delirium and its underlying precipitant (eg infection, dehydration, constipation, pain) is crucial.[63]
- Older people with a progressive decline in cognition should undergo detailed assessment to diagnose and, where possible, treat reversible causes of the cognitive decline.[63] Referring the older person to a specialist memory service can be helpful for diagnosing their cognitive impairment accurately, and linking with appropriate community services.
- General practitioners should assess the falls risk factors for older people with cognitive impairment (as discussed in other chapters), and offer interventions to modify risk.[64] Some interventions need the person to be able to follow instructions or comply with a program (eg exercise). Where there is doubt about an older person's ability to follow instructions safely, the general practitioner (or other member of the health care team) should conduct an individualised assessment and develop a falls prevention plan using the information from the assessment on their behalf.

Table 4.5 summarises some of the many tools that can be used to assess cognitive status.

Table 4.5 Tools for assessing cognitive status

Dementia screening	
Folstein Mini-Mental State Examination[65]	
Description	The Folstein Mini-Mental State Examination is a widely used method for assessing cognitive mental status. It is an 11-question measure that tests five areas of cognitive function: orientation, registration, attention and calculation, recall and language. The maximum score is 30.
Time needed	5–10 minutes
Criterion	A score ≤23 indicates mild cognitive impairment A score ≤18 indicates severe cognitive impairment

Dementia screening	
Rowland Universal Dementia Scale[66,67]	
Description	The Rowland Universal Dementia Scale is a simple method for detecting cognitive impairment. The scale is valid across cultures, portable and administered easily by primary health care professionals. It uses six items to assess multiple cognitive domains, including memory, praxis, language, judgment, drawing and body orientation.
Time needed	10 minutes
Criterion	A score of >23 (out of a maximum score of 30)
Rating	89% sensitivity 98% specificity

Delirium screening	
Confusion Assessment Method[68]	
Description	The Confusion Assessment Method is a comprehensive assessment instrument that screens for clinical features of delirium. The method comprises four features, which are determined by the older person, nurse and family interview. These are: • an onset of mental status changes or a fluctuating course • inattention • disorganised thinking • an altered level of consciousness (ie other than alert).
Time needed	5 minutes
Criterion	The older person is diagnosed as delirious if they have both the first two features, and either the third or fourth feature
Rating	94% sensitivity 90% specificity[69]

Point of interest: strategies for maintaining hydration in older people

Older people with cognitive impairment may become dehydrated easily, which can lead to delirium. An Australian study used strategies developed by the Joanna Briggs Institute Practical Application of Clinical Evidence System[70] to maintain oral hydration in residents of residential aged care facilities.[71] Although adherence was problematic, the following strategies recommended by the Joanna Briggs Institute may be beneficial:

- Drinks (cordial, juice and water, but not caffeinated drinks) were offered by staff every 1.5 hours (as well as morning tea, afternoon tea and supper rounds).
- Residents with cognitive impairment were either helped or prompted to drink.
- An accessible water fountain was set up with a supply of cups.
- Filled jugs of water were placed on all tables, with cups.
- Drinks were always given with medication.
- Icy poles, jellies and ice-cream were offered throughout the day as snacks and enjoyable treats.
- Fruit with a high water content (eg grapes, peeled mandarins) was placed on kitchen tables for easy access and picking.
- Light soups were given with meals.
- Happy hour was introduced twice a week with nonalcoholic wines, mocktails, soft drinks and nibbles.
- Warm milk drinks were given to help people settle at night.

These strategies may also be applicable to older people with cognitive impairment living at home.

Case study

Mr F is a 72-year-old man living with his wife in the community. He was recently diagnosed with Alzheimer's disease. In the afternoon, Mr F often wanders off to walk around in the garden. To go from the house into the garden, he has to walk up and down two steps. On more than one occasion, he has fallen down the steps. Since his wife cannot help him up again, she has to ask their neighbour for help. The community nurse suggested that an occupational therapist run a home environment assessment. As a result, the occupational therapist recommended that they install an antislip ramp with a rail. Now Mr F can get in and out of the house without having to negotiate the steps.

4.4 Continence

Recommendations

Assessment

- Older people should be offered a continence assessment to check for problems that can be modified or prevented.

Intervention

- Manage problems associated with urinary tract function as part of a multifactorial approach to care. (Level I-*)[15]

Note: there is no evidence that assessing or treating incontinence will prevent falls in older people living in the community.[5]

Good practice point

- Check the height of the toilet and the need for rails to assist the older person sitting and standing from the toilet.

4.4.1 Screening continence

People will make extraordinary efforts to avoid an incontinent episode, including placing themselves at increased risk of falling. Incontinence, assisted toileting[72,73] and symptoms of overactive bladder[74,75] have been identified as risk factors for falls in older people who live in the community.[76,77]

The cause of incontinence should be established through a thorough assessment; for example, using ward urinalysis. Older people may have more than one type of urinary incontinence, which can make assessment findings difficult to interpret.[78] The following strategies should be used to assess the older person's continence status:

- Obtain a continence history from the person. This might include such things as a bladder chart (a frequency/volume chart or a continence diary). Continence history should be recorded for a minimum of two days[79] to help provide a valid assessment. Simple, validated questions to the older person can help differentiate the type of urinary incontinence they have.[80] Sometimes, a bowel assessment is required. The older person's normal bowel habits and any significant change must be determined, because constipation can considerably affect bladder function.
- The suitability of diagnostic physical investigations should be addressed on an individual basis. Consent from the older person must be obtained

before the physical examination, which should be done by a suitably qualified health professional.

- Post-void residuals should always be checked in incontinent older people.[81]
- Functional considerations, such as reduced dexterity or mobility, can affect toileting, and should be assessed and addressed.
- The toilet should be assessed for accessibility (especially if the older person uses a walking aid), proximity, height and the number of household members using the same toilet.
- Risk factors for falling related to incontinence need to be considered along with the symptoms and signs of bladder dysfunction.

4.4.2 Strategies for promoting continence

Appropriate management of incontinence may improve overall care, but it is difficult to make strong recommendations because specific incontinence strategies have not been part of successful falls prevention programs in a community setting.[82] However, studies from the hospital setting have shown that toileting protocols and practices for older people at risk of falling should be included in multifactorial falls prevention interventions.[83,84] Also, multifactorial falls prevention interventions in hospitals should include management of urinary tract function.[85]

The suggested strategies below are adapted from those recommended by the Third International Consultation on Incontinence 2005[81] and should be used to promote continence in the community setting:

- Make sure the older person has access to a comprehensive and individualised continence assessment that identifies and treats reversible causes, including constipation and medication side effects.
- Use an adequate trial of conservative therapy as the first line of management.
- Establish treatment strategies as soon as incontinence has been diagnosed. The aim of managing urinary incontinence is to alter those factors causing incontinence and to improve the continence status of the person. Management of incontinence is a multidisciplinary task that ideally involves doctors, nurse continence advisors, physiotherapists, occupational therapists and other suitably qualified health professionals.
- Address all comorbidities that can be modified.
- Encourage programs to help improve the older person's control over their toileting regime, and reduce the likelihood of incontinence episodes.

These programs include
  - *habit retraining* — based on identifying a pattern of voiding and tailoring the toileting schedule to the older person
  - *prompted voiding* — to increase continence by increasing the older person's ability to discriminate their continence status and to respond appropriately
  - *timed voiding* — characterised by a fixed schedule of toileting.
- Trial reducing an older person's caffeine and carbonated drinks intake to help decrease symptoms of urgency and frequency.
- Minimise environmental risk factors by
  - keeping the pathway to the toilet obstacle free and leaving a light on in the toilet at night
  - ensuring the older person is wearing suitable clothes that can be easily removed or undone
  - recommending appropriate footwear to reduce slipping in urine
  - placing a nonslip mat on the floor beside the bed, which may be useful for older people who experience incontinence on rising from the bed, particularly if on a noncarpeted floor in the bedroom (care must be taken when using mats to ensure the older person does not trip on the mat)
  - checking the height of the toilet and the need for rails to assist the older person sitting and standing from the toilet (reduced range of motion in hip joints is common after total hip replacement or surgery for fractured neck of femur, and might mean the height of toilet seat should be raised).
- Where possible, consult with a continence adviser if usual continence management methods as described above are not working or the older person is keen to learn simple exercises to improve their bladder or bowel control. Some men are resistant to the idea of doing pelvic floor exercises. This should be recognised and the benefits explained.
- Consider the use of continence aids as a trial management strategy.

Case study

Mrs U is an 85-year-old woman who presented to her general practitioner (GP) with a bruised face after falling. When the general practitioner asked why she fell, she said she was rushing to the toilet. The continence assessment revealed that she had reduced bladder capacity and detrusor instability from chronic constipation. The constipation was treated and Mrs U no longer needed to rush to the toilet. The GP was also careful to consider many of the other risk factors for falling that were identified from the falls risk assessment and ensure that targeted interventions were implemented accordingly.

4.5 Feet and footwear

Recommendations

Assessment

- Assessment should include screening for ill-fitting or inappropriate footwear and for foot pain and other foot problems, because these are risk factors for falls.

Interventions

- Include an assessment of footwear and foot problems as part of an individualised, multifactorial intervention for preventing falls in the community. (Level IV)[86,87]
- Health care providers should provide education and information about footwear features that may reduce falls risk. (Level III-2)[88]

Note: there is no evidence that assessing or addressing footwear and foot problems as a single intervention will prevent falls in older people living in the community.

Good practice points

- Health care providers should educate older people and provide information on foot problems and foot care, and refer them to a podiatrist, when necessary.
- Safe footwear characteristics include:
  - *soles:* shoes with thinner, firmer soles appear to improve foot position sense; a tread sole may prevent slips on slippery surfaces
  - *heels:* a low, square heel improves stability
  - *collar:* shoes with a supporting collar improve stability.

4.5.1 Screening feet and footwear

Inappropriate footwear is a contributing factor to falls[89] and fractures in older people.[90]

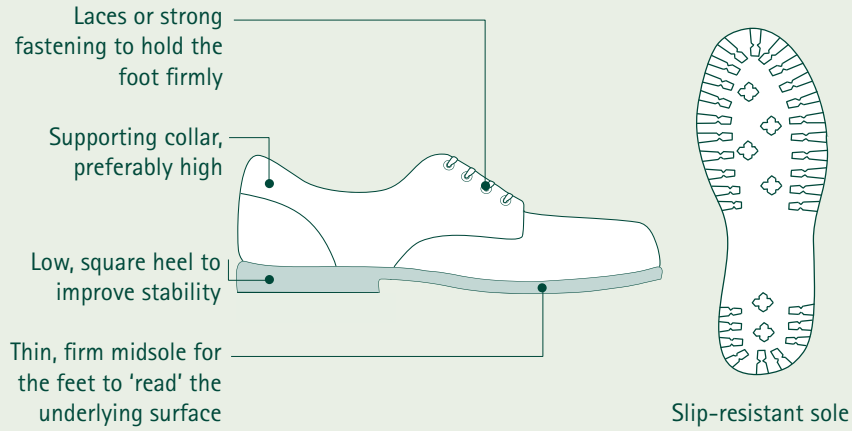
An assessment of footwear and foot problems should be included as part of an individualised, multifactorial and multiple intervention for preventing falls in the community.[86,87] The following components of feet and footwear assessment are most relevant to this group of older people:

- *Footwear* — use the safe shoe checklist, which is a reliable tool for evaluating specific shoe features that could improve postural stability in older people.[91]
- *Foot problems* — assess foot pain and other foot problems regularly. An older person with an undiagnosed peripheral neuropathy should be referred to a medical practitioner to look for potentially reversible or modifiable causes of the neuropathy. Some of the more common causes of a peripheral neuropathy include diabetes, vitamin B12 deficiency, peripheral vascular disease, alcohol misuse and adverse effects of some drugs.[92]
- Refer the older person to a health professional who is skilled in assessing feet and footwear (eg a podiatrist) for additional investigations and management as required.[93]

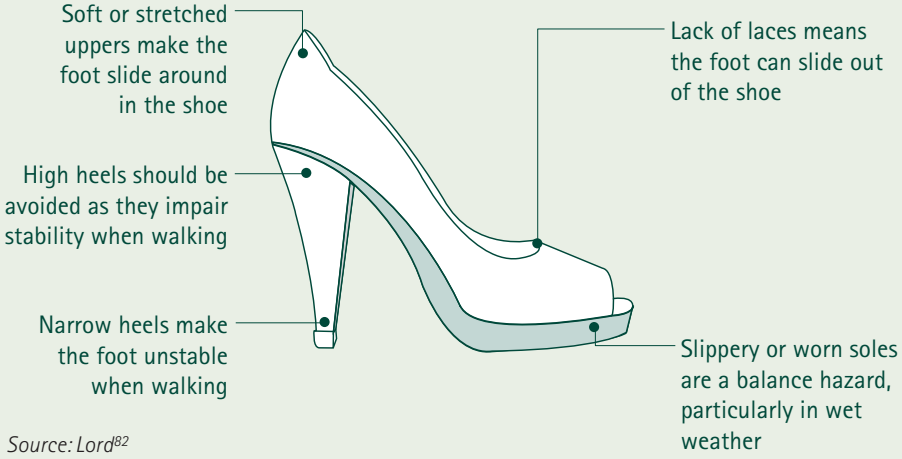
A detailed assessment by a podiatrist for fall risk factors may also be needed. This examination should include:[94]

- *falls history* — including foot pain and footwear
- *dermatological assessment* — skin and nail problems, infection
- *vascular assessment* — peripheral vascular status
- *neurological assessment* — proprioception, balance and stability, sensory, motor and autonomic function
- *biomechanical assessment* — posture, foot and lower limb joint range of motion testing, evaluation of foot deformity (eg hallux valgus) and gait analysis
- *footwear assessment* — stability and balance features, prescription of footwear or footwear modifications, or foot orthoses based on assessment of gait in shoes
- *education* — foot care and footwear, to endorse the link between footwear or foot problems and falls risk.

What makes a shoe safe?



What makes a shoe unsafe?



Source: Lord[82]

Figure 4.1 The theoretical optimal 'safe' shoe, and 'unsafe' shoe

4.5.2 Strategies for improving foot condition and footwear

As foot pain and footwear are amenable to treatment, podiatric intervention has the potential to improve mobility and postural stability. To date, no randomised controlled trials have assessed foot or footwear intervention to prevent falls. However, the following strategies, which are based on other, lower quality studies, may help to prevent falls in older people living in the community:

- Foot problems
  - debride calluses to improve functional ability[95]
  - use toe-strengthening exercises to reduce sway[96]
  - investigate and treat the cause of a peripheral neuropathy where possible.[97]
- Footwear
  - use textured insoles to improve stepping responses to platform perturbation in older people[98]
  - use foot orthoses to improve posture and balance.[97,99]

Older people might be reluctant to change their footwear. A report published in 1993 mentioned several factors that discouraged people from using safe shoes, such as foot problems, difficulty putting them on, expense, style and lack of knowledge about their importance.[100] All health care professionals can play an important role in advising older people about safe footwear by:

- identifying ill-fitting or inappropriate footwear
- screening older people for foot pain or foot problems
- educating older people and carers about basic foot care and providing information about footwear
- encouraging older people to ensure shoes are repaired when indicated and cleaned regularly
- recognising that older people who have a shuffling gait may be at higher risk of falling if they wear nonslip shoes on certain carpeted floors
- ensuring that people with urinary incontinence have dry, clean footwear
- ensuring older people have more than one pair of shoes in case of shoe soiling or damage
- discouraging walking while wearing slippery socks and stockings
- discouraging the use of talcum powders, which may contribute to slippery floors

- referring an older person to a podiatrist for further assessment and management if any of the following conditions or clinical signs are evident
  - foot pain
  - foot problems such as swelling, arthritis, bunions, toe deformities, skin and nail problems (especially corns and calluses) or other foot abnormalities (eg collapsed arches or a high-arched foot)
  - conditions affecting balance, posture or proprioception in the lower limbs, such as diabetes, peripheral neuropathy or peripheral vascular disease
  - unsteady or abnormal gait
  - inappropriate or ill-fitting footwear or a requirement for foot orthoses
- referring the older person to a podiatrist for orthotics in cases of significantly deformed feet.

However, it is important to recognise that lack of adherence to any of these interventions will limit the effectiveness of good footwear for preventing falls.

Case study

Mr R visited his general practitioner (GP) for management of his diabetes. He also has a recent history of falls. After a basic foot screening, the GP found that Mr R had poor sensation and some calluses and lesions on his feet, so the GP referred him to a community podiatry service. The podiatrist diagnosed mild peripheral neuropathy, and also found that Mr R was unsteady because he wore over-sized sports shoes with a thick, cushioned sole to 'help' his calluses. The podiatrist treated Mr R's lesions and taught him how to buy better fitting footwear that improved his stability, but was still safe for his neuropathic feet. Mr R's balance improved after he purchased more appropriate footwear.

4.6 Syncope

Recommendations

Assessment

- Older people who report unexplained falls or episodes of collapse should be assessed for the underlying cause.

Intervention

- Assessment and management of potential causes of presyncope and syncope should form part of a multifactorial intervention to reduce the rate of falls in older people. (Level I)[5]
- Use cardiac pacing in older people who live in the community, and who have carotid sinus hypersensitivity and a history of syncope or falls, to reduce the rate of falls. (Level II)[13]

4.6.1 Assessing syncope

Syncope is a transient and self-limiting loss of consciousness. It is commonly described as *blacking out* or *fainting*. Presyncope describes the sensation of feeling faint or dizzy and can precede an episode of loss of consciousness. While a number of conditions can present with syncope, all share the final common pathway of cerebral hypoperfusion leading to an alteration in consciousness. Older people are more predisposed to syncopal events due to age-related physiological changes that affect their ability to adapt to changes in cerebral perfusion.

It is important to ensure that older people reporting presyncope or syncope undergo appropriate assessment and intervention, particularly if the cause is not obvious. The symptoms should be reported to their GP and, depending on the history and results of the clinical examination, a number of tests and further investigations may be warranted. This may include an electrocardiogram, echocardiography, Holter monitoring, tilt-table testing and carotid sinus massage or insertion of an implantable loop recorder.

4.6.2 Treating syncope

Permanent cardiac pacing is successful for treating certain types of syncope. Pacemakers reduce falls by 70% in people with accurately diagnosed cardioinhibitory carotid sinus hypersensitivity.[13] A number of successful multifactorial falls prevention strategies have included assessments of blood pressure and orthostatic hypotension, and medication review and modification.[73,101-103]

The symptoms of orthostatic hypotension can be reduced using the following strategies:

- Ensure good hydration is maintained, particularly in hot weather.[104-106]
- Encourage the older person to sit up slowly from lying, stand up slowly from sitting, and wait a short time before walking.[104,105]
- Minimise exposure to high temperatures or other conditions that cause peripheral vasodilation, including hot baths.[105]
- Minimise periods of prolonged bed rest and immobilisation.
- Encourage older people to rest with the head of the bed raised.
- Increase salt intake in the diet, if not contraindicated.
- Where possible, avoid prescribing medications that may cause hypotension.
- Identify any need to use appropriate peripheral compression devices, such as antiembolic stockings.[105]
- Monitor and record postural blood pressure.[106]

Case study — postprandial hypotension

Mr L is an 82-year-old man who was taken to an emergency department by ambulance after falling at a shopping centre. At the emergency department, staff learnt that Mr L had suffered three other recent falls, all of which he described as occurring as a result of blackouts. Mr L was referred to a cardiology unit where, after initial assessment, he underwent carotid sinus massage with head-up tilt. During massage of the right carotid sinus with 70° head-up tilt, Mr L had a documented period of three seconds of asystole from which he was symptomatic. He was subsequently fitted with a dual chamber pacemaker. In the six months after this procedure Mr L suffered no further falls.

4.7 Dizziness and vertigo

Recommendations

Assessment

- Vestibular disorders as a cause of dizziness, vertigo and imbalance need to be identified in the community setting. A history of vertigo or a sensation of spinning is highly characteristic of vestibular pathology.
- Use the Dix–Hallpike test to diagnose benign paroxysmal positional vertigo, which is the most common cause of vertigo among older people, and can be identified in the community setting. This is the only cause of vertigo that can be treated easily.

Note: there is no evidence from randomised controlled trials that treating vestibular disorders will prevent falls.

Good practice points

- Use vestibular rehabilitation to treat dizziness and balance problems where indicated.
- Use the Epley manoeuvre to manage benign paroxysmal positional vertigo.
- All manoeuvres should only be done by an experienced person.

4.7.1 Assessing vestibular function

Dizziness in older people often represents a difficult diagnostic problem, because it is a subjective sensation that may result from impairment or disease in multiple systems. When residents describe being 'dizzy', 'giddy' or 'faint', this may mean anything from an anxiety or fear of falling, to postural dysequilibrium, vertigo or presyncope. Therefore, a detailed history is crucial.

An important step in minimising the risk of falls associated with *dizziness* is to assess vestibular function. This can be done using the following steps and tests (these tests should only be done by an experienced person):

- Ask the older person about their symptoms. Dizziness is a general term that is used to describe a range of symptoms that imply a sense of disorientation.[107] Dizziness may be used as a term by an older person to describe poor balance. *Vertigo*, a subtype of dizziness, is highly characteristic of vestibular dysfunction and is generally described as a sensation of spinning.[108]

- Assess peripheral vestibular function using the Halmagyi head-thrust test.[109] It has good sensitivity only if the vestibular dysfunction is severe or complete.[110]
- Use audiology testing to quantify hearing loss. The auditory and vestibular systems are closely connected; therefore, auditory symptoms (hearing loss, tinnitus) commonly occur in conjunction with symptoms of dizziness and vertigo.[111]
- If needed, request computed tomography or magnetic resonance imaging to identify an acoustic neuroma or central pathology.[108]
- Use the Dix–Hallpike test to diagnose benign paroxysmal positional vertigo (BPPV). This test is included in a diagnostic protocol for evaluating dizziness in older people in general practice[111] and is considered mandatory in all older people with dizziness and vertigo following head trauma.[112] BPPV should be strongly considered as part of the differential diagnosis in older people who report symptoms of dizziness or vertigo after a fall that involved some degree of head trauma.
- Use vestibular function tests to evaluate the integrity of the peripheral (inner ear) and central vestibular structures. These tests are available at some specialised audiology clinics and may be recommended if symptoms persist.[113]
- Refer the older person to a specialist, such as an ear, nose and throat specialist or a neurologist, if required.[108]

4.7.2 Choosing interventions to reduce symptoms of dizziness

The following strategies can be used in the community setting to treat dizziness and balance problems caused by vestibular dysfunction. They can be used as part of a multifactorial falls prevention program to reduce the risk of falls related to dizziness.

Medical management

A randomised controlled trial showed that treatment with methylprednisolone within three days of acute onset of vestibular neuritis (viral infection of inner ear structures) improves vestibular function at 12-month follow-up, with complete or almost complete recovery of vestibular function in 76% of the study population.[114]

Based on clinical experience, treatment with antiemetics and vestibular suppression medication may be required to treat the unpleasant associated symptoms of nausea and vomiting.[115] These medications should only be used for a short duration (one to two weeks) because they adversely affect the process of central compensation after acute vestibular disease.[108,115]

Treating benign paroxysmal positional vertigo

A range of treatments for BPPV have been described in the literature. These include:

- Brandt and Daroff exercises — these can be done regularly at home[116]
- the Epley manouevre — this is used commonly by clinicians and involves taking the older person slowly through a range of positions that aim to move the freely mobile otoconia (in the inner ear) back into the vestibule;[117] a meta-analysis showed that this manouevre is highly successful for treating BPPV.[118]

Older people with diagnosed BPPV respond as well to treatment as the general population; therefore, no special approaches are needed in this older group.[119] However, it is important to diagnose and treat BPPV as soon as possible, because treatment improves dizziness and general wellbeing.[119]

Vestibular rehabilitation

Vestibular rehabilitation (VR) is a multidisciplinary approach to treating stable vestibular dysfunction. The physiotherapy intervention component focuses on minimising the older person's complaints of dizziness and balance problems through a series of exercises, which are modified to suit each person.[120] The occupational therapy intervention component involves incorporating the movements required for these exercises into daily activities,[121] and psychology input addresses the emotional impact of vestibular dysfunction.[122]

The literature emphasises the following characteristics of VR:

- VR is highly successful in treating stable vestibular problems in people of all ages.[123]
- Starting VR early is recommended in the community setting, because delayed initiation of VR is a significant factor in predicting unsuccessful outcomes over time.[124]
- The success of VR in older people in the community is not influenced by age.[125]

- VR can improve measures of balance performance in people in the community who are older than 65 years;[126,127] however, a study of people with multisensory dizziness found that the prevalence of falls over a 12-month period did not differ between those receiving VR and a control group.[128]

Regular training courses in vestibular rehabilitation are held across Australia, and an increasing number of physiotherapists working in the community setting are now trained to assess and manage dizziness. These physiotherapists can be found by contacting the Australian Physiotherapy Association† or the Australian Vestibular Association.‡

Case study

Mr S is an 81-year-old man who presented to his general practitioner (GP) with vague symptoms of giddiness. He reported feeling giddy when getting out of bed in the morning so that he had to sit for five minutes on the edge of the bed before standing up. He walks with a stick, but has had several falls at home without serious injury. He reported that he no longer lies flat in bed (he uses three pillows at night) and was unable to roll to the left without feeling giddy.

Mr S's GP tested him for benign paroxysmal positional vertigo (BPPV) using the Dix–Hallpike test, which identified BPPV in Mr S's left inner ear. He was subsequently treated with an Epley manoeuvre and taught Brandt-Daroff exercises to do daily at home.

Mr S was no longer giddy, could lie flat in bed and was able to roll easily onto his left side. He reported that his balance was also better and he had no recent falls. Some milder symptoms returned about four months later, but these were helped with a repeat of the Epley manoeuvre.

† http://members.physiotherapy.asn.au

‡ http://www.dizzyday.com/avesta.html

4.8 Medications

Recommendations

Assessment

- Older people living in the community should have their medications (prescribed and nonprescribed) reviewed at least yearly, and for those on four or more medications, at least six monthly.

Intervention

- Medication review and modification should be undertaken as part of a multifactorial approach to falls prevention. (Level I)[5]
- For individual older people, gradual and supervised withdrawal of psychoactive medications should be considered to prevent falls. (Level II)[10]
- Pharmacist-led education on medication and a program of facilitated medication review by general practitioners should be encouraged in the community setting. (Level II)[14]

Good practice point

- Consider likely pharmacological changes when prescribing any new medication to an older person and avoid prescribing psychoactive drugs if clinically possible.

4.8.1 Reviewing medications

Medication use is associated with falls in older people. Therefore, GPs should review medications yearly for all older people and every six months for older people who take four or more medications.[129]

Older people who live in the community are eligible for a domiciliary medication management review (DMMR), which is a service that encourages collaboration between the older person, their GP, pharmacist and other health professional to review medication use. DMMR results in a report from an accredited pharmacist to the referring GP, and a medication management plan agreed between the GP and the older person or their carer. A DMMR is available following a referral from a GP. For more information, see the Australian Government Department of Health and Ageing website.†

† http://www.health.gov.au/internet/main/publishing.nsf/Content/health-epc-dmmr-answers.htm

Older people who may benefit from a DMMR include those:

- on multiple medications
- who have recently been discharged from hospital
- with recent and significant changes to their medications
- who are seeing a number of different GPs and specialists.

Also, any member of the older person's health care team may use the checklist in the following box to help decide whether a person requires a DMMR from a pharmacist or doctor.[14]

Checklist for medication review[130]

A medication review is needed if the older person:

- is taking four or more different types of medications
- is taking more than 12 doses of medication a day
- had significant changes made to the medication regime in the past three months
- is attending a number of different doctors
- is taking one or more psychoactive medications
- was recently discharged from a hospital (in the past four weeks)
- has multiple medical conditions
- is suspected of not adhering with their medication regime
- shows symptoms that suggest an adverse medication reaction (eg confusion, dizziness, reduced balance)
- is using medications with a narrow therapeutic index or medication requiring therapeutic monitoring (such as warfarin)
- is responding subtherapeutically to treatment.

Figure 4.1 is an example of a medication risk-assessment form.

1. How old are you? ☐	Are you (please ✓):		Male ☐	Female ☐
		Yes	No	Don't know
2. Do you have 3 or more health conditions? (please ✓):		☐	☐	☐
3. In general, would you say your health is poor?		☐	☐	☐
4. Have you changed your general practitioner in the past 3 months?		☐	☐	☐
5. Do you have more than one doctor involved in your care, including other general practitioners or specialist?		☐	☐	☐
6. Have you been in hospital, hostel or nursing home in the past month?		☐	☐	☐
7. Do you live alone?		☐	☐	☐
8. Have you had a fall in the past 12 months?		☐	☐	☐
9. In the last month have you:	Had trouble sleeping	☐	☐	☐
	Felt drowsy or dizzy	☐	☐	☐
	Felt nauseous	☐	☐	☐
	Had stomach problems	☐	☐	☐
	Had a skin rash or itch	☐	☐	☐
	Leaked urine	☐	☐	☐
	Been constipated	☐	☐	☐
10. How many medicines do you use? *(Write in box)* ☐ *Medicines includes all medicines prescribed by your doctor or any other doctor, including specialists medicines bought from chemist, supermarket or health food store, medicines you take only occasionally, herbal medicines, vitamins, minerals, puffers, creams, patches, eye drops and laxatives.*				
If you do NOT take any medicines, then there is no need to fill in the rest of this page		Yes	No	Don't know
11. Have you started a new medicine in the last 4 weeks?		☐	☐	☐
12. Do you use:	Any medicine that helps you sleep	☐	☐	☐
	Any medicines for your nerves, stress, anxiety or depression	☐	☐	☐
	Any medicines your doctor does not know about	☐	☐	☐
13. Have you been taking any medicines for more than 6 months?		☐	☐	☐
14. For any medicine, you currently use, do you have any:		☐	☐	☐
	Trouble with side effects	☐	☐	☐
	Trouble remembering to take the medicine	☐	☐	☐
	Trouble knowing what medicine is for	☐	☐	☐
	Trouble using many medicines at once	☐	☐	☐
	Trouble reading the label	☐	☐	☐
	Trouble affording the medicine	☐	☐	☐
	Trouble understanding the label	☐	☐	☐
	Trouble opening bottles or packets/applying the medicines	☐	☐	☐
15. Have you had more than 4 changes to your medicines in the past 12 months?		☐	☐	☐
16. Do you share medicines among family and friends?		☐	☐	☐
17. Has your doctor asked you to bring ALL your medicines to an appointment so he can have a look at them, in the past 12 months?		☐	☐	☐

Please give all forms to your doctor

DOCTOR'S USE ONLY:	Medication Review beneficial: Yes / No	Patient agrees: Yes / No

Figure 4.1 Medication risk-assessment form[14]

4.8.2 Quality use of medicines

The following strategies help to ensure quality use of medicines, and are good practice for minimising falls in older people in the community:

- Multiple drug use should be limited to reduce side effects and interactions and a tendency towards proliferation of medication use.
- Drugs that act on the central nervous system, especially psychoactive drugs, are associated with an increased risk of falls; therefore, they should be used with caution and only after weighing up their risks and benefits.
- Prescribe the lowest effective dosage of a medication specific to the symptoms.
- Provide support and reassurance to people who are gradually stopping the use of psychoactive medication(s).
- If the older person needs to take medications known to be implicated in increasing the risk of falls, try to minimise the troublesome effects (ie drowsiness, dizziness, confusion and gait disturbance).
- Provide the older person (and their carer) with an explanation of newly prescribed medications or changes to prescriptions.
- Educate the whole multidisciplinary team, older people and their carers to improve their awareness of the medications associated with an increased risk of falls.
- Document information when implementing, evaluating, intervening, reviewing, educating and making recommendations about the older person's medication use.

Case study

Mr P is an 80-year-old man who is taking nine different medications. He felt unsteady and had several falls, mainly during the night. During a routine check-up, his general practitioner (GP) assessed Mr P's need for a domiciliary medication management review (DMMR). The GP referred Mr P to his community pharmacist. The community pharmacist coordinated the review and began by making an appointment for Mr P to meet with an accredited pharmacist. The interview took place in Mr P's home, and the accredited pharmacist asked him about all the medications he has, those he is taking currently, and other information. Much of the information required for Mr P's review was in the referral and obtained at the meeting, but the pharmacist may also have referred to family members, carers, community nurses, Mr P's preferred community pharmacist or other members of the health care team, with Mr P's consent. The accredited pharmacist clinically assessed the information gathered about Mr P and his medications, and prepared a report for the GP.

Mr P's DMMR report recommended that he could slowly reduce and then stop taking a sleeping tablet and an antidepressant, which he had started taking two years earlier, after the death of his wife. This was agreed after a discussion between Mr P and his GP about the DMMR, and formed part of an agreed medication management plan. Mr P slowly reduced using both medications without ill effect. He felt much more alert and confident while up and about, and steadier when getting up at night.

4.9 Vision

Recommendations

Assessment

- Include a test of vision as part of a falls risk assessment.
- Encourage older people to have regular eye examinations (every two years) to reduce the incidence of visual impairment, which is associated with an increased risk of falls.

Interventions

- Older people with visual impairment primarily related to cataracts should undergo cataract surgery as soon as practicable. (Level II)[7,8]
- When correcting other visual impairment (eg prescription of new spectacles), explain to the older person and to their family and carers (where appropriate) that extra care is needed while the older person gets used to the new visual information. (Level II)[35]
- Advise older people who take part in regular outdoor activities to avoid bifocals or multifocals and to use single-vision distance spectacles when walking — especially when negotiating steps or walking in unfamiliar surroundings. (Level III-2)[131]
- People with severe visual impairment should receive a home safety assessment and modification program specifically designed to prevent falls. (Level II)[11,12]

Good practice point

- Detailed assessment by an optometrist or orthoptist for a fall-specific eye examination should:
  - identify the presence of eye diseases
  - calculate subjective refraction and determine optimum spectacle correction
  - check for high-contrast visual acuity using the Snellen eye chart and contrast sensitivity using the Pelli–Robson test charts, the Melbourne Edge Test or similar
  - assess visual fields using the Humphrey Field Analyser or similar
  - assess depth perception.

4.9.1 Screening vision

Vision screening should be included in multifactorial falls prevention interventions.[34]

The following strategies can be used to measure vision problems in older people in the community:

- Ask the older person about their vision and record any visual complaints and history of eye problems and eye disease.
- Check for signs of visual deterioration. These can include an inability to see detail in objects, or an inability to read (including avoiding reading) or watch television; and a propensity to spill drinks or bump into objects.
- Measure visual acuity or contrast sensitivity using a standard eye chart (eg Snellen eye chart) or the Melbourne Edge Test, respectively (see Table 4.6).
- Check for signs of visual field loss using a confrontation test (see Table 4.6) and refer for a full automated perimetry test by an optometrist or ophthalmologist if any defects are found. Large, prospective studies have found that falls are mostly associated with loss of field sensitivity, rather than loss of visual acuity and contrast sensitivity.[132,133]
- Arrange regular eye examinations to reduce the incidence of visual impairment,[134] which is associated with an increased risk of falls.[132]

Table 4.6 outlines the characteristics of eye-screening tests.

Table 4.6 Characteristics of eye-screening tests

Snellen eye chart (for testing visual acuity)	
Description	Standardised eye test of visual acuity. Comprises a series of symbols (usually letters) in lines of gradually decreasing size. Participant is asked to read the chart from a distance of 6 metres for standard charts (charts designed for shorter test distances are available; the examiner should check that they are using the correct working distance for the chart). Charts should also be well lit and not obscured by glare or shadows. Visual acuity is stated as a fraction, with 6 being the numerator and the last line read the denominator (the larger the denominator, the worse the visual acuity). Pocket versions of Snellen charts are available for a clinical screen of visual acuity (these smaller charts can be used at a shorter distance than the standard 6 metres to test visual acuity).
Time needed	5 minutes
Criterion	A score of 6/12 indicates visual impairment; however this depends on the age of the person (the cut-off score will decrease with increasing age).

Melbourne Edge Test (for testing contrast sensitivity)[135]	
Description	The test presents 20 circular patches containing edges with reducing contrast. Correct identification of the orientation of the edges on the patches provides a measure of contrast sensitivity in decibel units, where dB = $-10\log_{10}$ contrast, where contrast defines the ratio of luminance levels of the two halves of the circular patch.
Time needed	5 minutes
Criterion	Score of less than 18/24 indicates visual impairment; however this depends on the age of the person.[135]

Confrontation Visual Field Test[136]	
Description	Crude test of visual fields. Participant and examiner sit between 66 cm and 1 m apart at the same height, with the examiner's back towards a blank wall. To test the right eye, the participant covers the left eye with the palm of their hand and stares at the examiner's nose. The examiner holds up both hands in the upper half of the field, one either side of the vertical, and each with either 1 or 2 fingers extended, and asks the participant, 'What is the total number of fingers I am holding up?' The procedure is repeated for the lower half of the field but changing the number of fingers extended in each hand. The procedure is repeated for the left eye. If the participant incorrectly counts the number of fingers in the upper or lower field, the test should be repeated again and then recorded. If the participant moves fixation to view the peripheral targets, repeat the presentation. Results are recorded as finger counting fields R√ and L√ if the participant correctly reports the number of fingers presented. For those who fail this screening, a diagram should be drawn to indicate in which part of the field the participant made an error.
Time needed	4 minutes
Criterion	If the participant incorrectly reports the number of fingers held up in either eye, they should be referred for a full visual field test.

If more detailed visual assessment is needed once the older person has been assessed using the crude visual screening methods described above, or if the older person scores poorly on these tests, the general practitioner should refer them to an optometrist, orthoptist or ophthalmologist for a full vision assessment.

4.9.2 Choosing vision interventions

When a visual deficit is identified, the older person's GP should seek a diagnosis to provide interventions — including referral to an ophthalmologist or optometrist, as necessary.

Cataract surgery

Expedited cataract surgery is the only evidence based vision intervention that has shown to be effective in reducing both falls and fractures in older people.[7,8]

Compared with expedited cataract surgery, prolonged waits on lists for cataract surgery are associated with an increased risk of falls and fractures.[7,8] Therefore, an occupational therapist should assess environmental safety to identify potential hazards, lack of equipment and risky behaviours that might cause falls in people with severe visual impairment, including those waiting for cataract surgery (see *Home safety assessment and modification*, below).

Referral to an ophthalmologist

As part of inpatient hospital care, one randomised controlled trial showed that falls could be reduced by a multifactorial approach that included referring the older person to an ophthalmologist when a new visual problem is detected, or if there is no known reason for poor vision.[85] This could be applied in the community setting as well.

Also, recommend that the older person sees an optometrist if they have impaired visual acuity, wear spectacles that are scratched or do not fit comfortably, or have not had an eye examination in the past year.

Optimal prescription

If the older person wears spectacles, their GP or other member of the health care team may check their visual acuity with their current spectacles and refer them for optometric assessment if it is less than 6/7.5. However, caution is required in frail older people, because comprehensive vision assessment with appropriate treatment may increase the risk of falls (see Section 3.1.1).[35] Large changes in refractive correction should be prescribed only with great care and warnings about adaptation problems, or a partial change in refractive correction should be made in such cases.

Choice of spectacles

Older people may benefit from an assessment by an optometrist or ophthalmologist, who can provide advice on the most appropriate type of spectacle correction. Older people who live in the community and who wear bifocal or multifocal spectacle lenses when walking outside the home and on stairs have a decreased ability to negotiate steps safely[137] and a doubled risk of falls from tripping.[131] Older people with a history of falls or an increased risk of falls should be advised to avoid bifocals or multifocals and to use single-vision distance spectacles when walking – especially when negotiating steps or walking in unfamiliar surroundings. A study also suggested telling older people who wear multifocals and distance single-vision spectacles to bend their heads rather than just lowering their eyes to look downwards to avoid postural instability.[138]

Home safety assessment and modification

Interventions that improve visual cues and minimise environmental hazards should be used, including provision of adequate lighting and contrast (eg by applying adhesive strips for steps, or painting the edges of pathways white).[11,12] Occupational therapists can also provide home visits to help older people modify their behaviours, allowing them to live more safely in both the home and the external environments.[139]

Point of interest: mobility training

Vision Australia specialises in safe mobility training for visually impaired people:
http://www.visionaustralia.org.au/

Case study

Mrs J is 75 years old and badly bruised her left arm after falling over a step. Her general practitioner (GP) tested her vision using a standard Snellen eye chart and found that her visual acuity was reduced. The GP arranged for her to see an ophthalmologist, who diagnosed a cataract in Mrs J's right eye. Within the next month, she was scheduled for cataract extraction. After the operation, Mrs J was pleased to notice an almost immediate improvement in her vision. She now feels much safer while walking in unfamiliar places and has not fallen since the operation.

4.10 Environmental considerations

Recommendations

Assessment

- Older people considered to be at higher risk of falling should be assessed by an occupational therapist for specific environmental or equipment needs and training to maximise safety.

Intervention

- Environmental review and home hazard modification should be considered as part of a multifactorial approach in a falls prevention program for older people in the community. (Level I)[5]
- When conducted as a single intervention, home environment interventions are effective for reducing falls in high-risk older people. (Level I)[9]

Good practice point

- It is important to help the older person understand the relevance of any environmental modifications, to improve uptake of such interventions.

4.10.1 Assessing the older person in their environment

Environmental review and modification refers to checking the older person's environment for hazards that might cause them to fall, and then modifying or rearranging the environment to remove or minimise these hazards.

An environmental assessment should be done by a health professional (eg an occupational therapist) with experience and training in evaluating people and their environment.[5] An occupational therapist can evaluate older people to determine their capacity to plan and perform activities of daily living and to meet the functional demands of the environment.[140]

Within the community setting, an occupational therapy-based falls prevention intervention should:[141,142]

- focus on older people who have a history of falls
- help to make the necessary environmental modifications (eg using follow-up telephone calls or extra home visits, as needed)
- make sure the older person understands their risk factors for falling, and the consequences of falling (to improve compliance)
- recognise the preferences of the older person's family or carer and incorporate these into the intervention.

Where an occupational therapist receives a referral from another member of the health care team and is asked to review an older person because of a fall or risk of falls, the occupational therapist should do the following:[141,143]

- Conduct an initial evaluation and identify the range of environments in which the older person lives or works, chart their daily schedule or routine, and identify relevant activities of daily living for assessment.
- Understand the older person's fall experiences and their beliefs about what causes falls.
- Evaluate the older person's functional status within the context of their home environment by checking their
  - physical resources (strength, range of motion, coordination, sensation, balance) in functional situations, such as reaching and bending
  - perceptual or cognitive function
  - functional vision
  - general mobility.
- Taking into account the person–environment fit, conduct a review of the home and outdoors environment using a validated and comprehensive tool, such as the Westmead Home Safety Assessment (see the point of interest box, below). Use the tool with the older person and together identify hazards, possible solutions, and develop an action plan. The process should enable the older person to increase their awareness and observation skills for identifying fall hazards in other environments. Consider risk-taking behaviours and encourage protective adaptations. For example, this may be strategies to reduce rushing to answer the phone or cues to remember to turn the light on at entrance ways at night.

At the end of the evaluation, the occupational therapist should provide a summary that identifies requirements for:

- additional safety equipment
- assistive devices and recommendations for their use
- any rearrangement of furniture
- other environmental modifications
- mobility training and safety when walking around in public places.

Point of interest: assessment tools

The Westmead Home Safety Assessment determines how falls history, risky situations, habits, behaviours and personal characteristics affect an individual's safety level. It identifies 72 possible physical and environmental home hazards of older people at risk of falling.[144] Each item on the assessment form is rated as a 'hazard' or 'not a hazard', and information on all categorised hazards are identified and summarised so an action plan can be developed. It should be used in conjunction with the manual, *Home Fall Hazards*,[143] which outlines the evaluation approach to an environmental intervention in the home.

The Falls Behavioural Scale for Older People[145] is a 29-item self-reporting assessment tool that can be used to assess the kinds of everyday behaviours that can offer an older person protection from falling. It can also be given to the older person before a home visit to raise their awareness of a broader range of potential risks, and therefore contribute to discussion and problem solving.

The Home Falls and Accidents Screening Tool (Home Fast), which was developed by Newcastle University, can be used by health care professionals to identify older people who have an increased risk of falling, refer them for a more detailed falls risk assessment, and recommend falls prevention interventions. See the Department of Health (State Government of Victoria) website for more information (http://www.health.vic.gov.au/agedcare/maintaining/falls/providers/home/env_check.htm).

4.10.2 Designing multifactorial interventions that include environmental modifications

Effective environmental interventions should incorporate modifications, such as:[9,84,146]

- ensuring adequate lighting and reducing glare
- enhancing contrast at change of flooring levels
- modifying slippery floors or steps
- reducing clutter
- using walking aids
- removing loose carpets
- fixing uneven and broken pathways.

Falls can be further minimised by using luminous toilet signs and night sensor lights, as part of a multifactorial falls prevention intervention.[84] Other 'common-sense' interventions include installing grab rails in the bathroom, removing leaf litter on outdoor paths, replacing or fixing

worn mats, and ensuring that furniture and electrical cords are not placed in walkways.

Health care professionals or carers should discuss with older people if their personal belongings and furniture are to be moved. They should also determine the older person's preferred sleeping arrangements.

Case study

Mrs H, who lives alone, was recently discharged from hospital following a fall. Before she returned home, an occupational therapist visited Mrs H's home with her and made a list of things that needed to be changed, to reduce Mrs H's risk of falling again. Mrs H's daughter worked with the occupational therapist to make these changes, which included replacing floor mats in the hallway with nonslip coverings, installing a railing to help Mrs H get in and out of the shower, and asking the local newsagent (who delivered the paper in the mornings) to throw the paper on to the driveway, instead of on the lawn (where the grass was slippery and springy).

After Mrs H returned home, the occupational therapist discussed with her the importance of making these changes. She also watched Mrs H going about her normal activities of daily living for half a day at home, and together they wrote a list of 'risky behaviours' that might increase Mrs H's risk of falling (eg using an unstable chair instead of a ladder to reach the top cupboard). One week later, the occupational therapist rang Mrs H to make sure that she was avoiding these risky behaviours. Mrs H now has a greatly reduced risk of falling, because she understands her own particular risk factors for falling, and the benefits of being involved in making changes.

4.11 Individual surveillance and observation

Good practice points

- Sitter programs (eg using staff or volunteers to sit with at-risk older people) may be useful for individual people.
- Bed, chair or foot alarms can alert a carer that the person is attempting to mobilise.
- A personal alarm, when worn, can trigger an alert that a person has fallen, and minimise a lie on the floor.
- Electronic sensor monitoring systems are being developed and tested, but they are not likely to be available widely for some time.

4.11.1 Education and assessment

Little research on surveillance or observation has been done in the community setting. The following general principles of observation and surveillance are based on good practice in the hospital setting, and may be useful in the community setting.

Older people who have a high risk of falling should be informed of their risk. Adapting an information brochure for the community may be helpful for families and informal carers to discuss falls with the older person. This type of information should be targeted to those older people who have the highest risk of falling.

A home visit by an occupational therapist — with the older person — should be considered, as part of discharge planning. Referral to a falls clinic may be useful. If the older person wants to remain in their own home, the health care team (eg GP, allied health staff, carers and family) should make the home environment as safe as possible, including setting up a monitoring system to minimise the time spent on the floor in the event of a fall (see below).

4.11.2 Sitter programs

Some hospitals and residential aged care facilities have introduced sitter programs.[147-149] These programs use volunteers, families or paid staff to sit with older people who have a high risk of falling. The role of the sitter is to provide company for the person and to notify the appropriate personnel when the person wishes to undertake an activity where they may be at risk of falling. Sitter programs may be a viable strategy in some community settings, to reduce falls for selected people. However, sitter programs

require planning, resources, education, investment (particularly for paid individuals) and ongoing coordination. Sitter programs have not been specifically researched in the community setting, so it is not clear whether they would be helpful for older people living at home. Also, they may be too expensive for many older people and their carers or family. However, the older person's GP or other member of the health care team could encourage the older person's carers, family or friends to spend time sitting with the older person, particularly in waking hours.

4.11.3 Response systems

Response systems are usually a form of monitor, incorporating an alarm that sounds when a person moves or presses a button. A number of response systems are commercially available. A prospective cohort study investigated the use of alarms by people older than 90 years living either in their own home or within a care home. Many participants who lived alone owned a call alarm (70%; 57 out of 81 participants).[150] Despite this, use of the alarm was low among older people in the community who fell while alone (78%; 28 out of 36 participants). Reasons for not using the alarm included not wearing it, wearing it but not wanting to use it (wanting to stay independent, fearful of being taken to hospital) and difficulty in activating it.

In some systems, an alarm is activated by a pressure sensor when a person starts to move from a bed or chair. In other systems, an alarm sounds when any part of a person's body moves within a space monitored by the alarm. Another style of system activates when a person falls, but does not get up. For example, a bedside foot alarm to wake a sleeping carer may help to reduce the time the older person spends on the floor after a fall, although this has not been investigated in the community setting. Alternatively, a light sensor under the bed can be triggered when the older person steps out of bed during the night and alerts the sleeping carer.

Response systems require capital investment and rely on a third party[151] (eg the person's carer, family, neighbour or general community) to respond when the alarm sounds. Alarm systems that are triggered when a person has fallen are not preventive. Instead, they simply report the fall after the event, and minimise the time spent on the floor.

Surveillance and observation approaches are particularly useful for older people who forget or do not realise their limitations. Good practice involves:

- identifying those people who are at risk in the community
- assessing them in their own homes, and modifying the home environment and behaviour so the older person is as safe as possible
- involving their carer, family and neighbours, where possible, to provide additional surveillance
- encouraging them to enrol in an exercise program specifically for falls prevention, and undertake regular exercises either at home or in a class
- providing them with a personal alarm to use if they do fall, and ensuring they wear the alarm at all times (including in the shower or in bed — both of which are high-risk times).

Case study

Mrs Z is 79 years old and lives by herself. Her family worry about her, but also know that it is important to Mrs Z that she maintains her independence as long as possible. Mrs Z has had three falls previously, all related to meal preparation. Her family have discussed with her strategies to reduce her risk of falling, including using a four-wheel walker with a seat that would allow her to carry her food and drinks. Her family also help by bringing her meals five times a week. Mrs Z's neighbour visits her twice a week to help her in the kitchen.

Mrs Z's family has also bought Mrs Z a pendant alarm that she wears around her neck to activate if she has a fall and cannot get up. She was admitted to the emergency department of the local hospital after a fall. The hospital has put a green sticker in her case notes to indicate that she has an increased risk of falls.

5 Minimising injuries from falls

5.1 Hip protectors

Recommendations

Assessment

- When assessing an older person's need for hip protectors, the general practitioner or other health professional should consider the older person's recent falls history, age, mobility, disability status, and whether they have osteoporosis or a low body mass index.
- Assess the older person's cognition and independence in daily living skills (eg dexterity in dressing) to help determine whether they will be able to use hip protectors.

Intervention

- Physiotherapists or other members of the health care team should teach older people and their carers how to put hip protectors on properly, because their effectiveness is reduced when they are not worn correctly. (Level II)[152]
- When using hip protectors as part of a falls prevention strategy, the health care team or carer should check regularly that the older person is wearing their protectors, that the hip protectors are in the correct position, and that they have not stopped wearing them because of discomfort, inconvenience or other reasons. (Level I)[153]

Note: hip protectors have not been shown to prevent hip fractures in the community setting.

Good practice points

- Hip protectors should not be relied on to reduce falls-related injuries in the community setting, due to problems with adherence to the correct use of hip protectors. However, because they offer some protection to older people in residential aged care, hip protectors can be considered in community settings as part of a strategy to minimise harm from falls, as long as they are worn properly and their use is monitored.

5.1.1 Assessing the use of hip protectors

Hip protectors are one approach to reducing the risk of hip fracture. They come in various styles, and are designed to absorb or disperse forces on the hip if a person falls on to their hip area. Hip protectors consist of undergarments with protective material inserted over the hip regions. There are three types of hip protectors:

- Soft hip protectors are made from a soft material.
- Hard hip protectors consist of a firm, curved shell, sewn or slipped into a pocket in a lycra undergarment, similar to underpants or bike pants.
- Adhesive hip protectors are stuck directly to the skin of the wearer.

When assessing an older person's need for hip protectors, their general practitioner (GP) (or other member of the health care team) should consider the older person's recent history of falls, age, level of disability, mobility, whether they are unsteady on their feet, and whether they have osteoporosis. Assessing the person's cognition and independence in daily living skills (eg dexterity in dressing) may also help determine whether they will be able to use hip protectors. The general practitioner can use a falls risk-assessment tool to help decide whether someone has a high risk of hip fractures and therefore be considered for the use of hip protectors.

5.1.2 Wearing hip protectors

Soft hip protectors must be held in place over the greater trochanter of the femur if the hip protectors are to be of any benefit. Continence pads can be comfortably worn with soft hip protectors, but should be fitted first, next to the person's skin, before the hip protectors are put on.[154]

Hard hip protectors are held in place over the hip by lycra undergarments similar to underpants or bike pants. Different sizes (small to extra large) and designs for men and women are available. Continence pads can be worn in separate pants, underneath the garments holding the hip protectors.[155]

5.1.3 Using hip protectors at night

There is a risk of falling and breaking the hip during the evening and night. If the risk is high enough to justify the use of hip protectors, and the person gets out of bed to go to the toilet at night, the use of hip protectors at night should be considered. The soft hip protectors are relatively comfortable when positioned correctly and can be worn more easily in bed, because they are less obtrusive than the hard shell protectors.[155]

5.1.4 Training in hip protector use

Fitting and managing hip protectors is often the responsibility of a particular member of the health team — usually the community nurse or allied health professional. Nurses and home care workers are in a key position to encourage adherence with hip protectors, because they often help frail, older people with dressing, bathing and toileting. Nurses and home care workers should be given education and support for developing strategies to encourage adherence to the correct use of hip protectors.

Training the individual wearer may encourage older people to wear hip protectors correctly, by addressing any barriers that the person sees to wearing hip protectors, and providing precise instructions and demonstrations on how to wear them.[156] Before the older person starts wearing hip protectors, the health care team and carers should discuss arrangements for cleaning hip protectors. Washing in domestic washing machines and dryers is feasible, but some hip protectors will not withstand commercial laundering. While self-adhesive hip protectors may be appealing in some instances (ie they can be worn under the older person's own undergarments), it is unclear whether they can be used safely in the long term.

5.1.5 Cost of hip protectors

Cost of hip protectors appears to be a factor influencing uptake. Reimbursement by private health funds or by appliance supply schemes may improve this problem. It is unclear to what degree cost affects adherence with the longer term use of hip protectors.

Case study

Mr T is an 84-year-old man who lives with his 79-year-old wife in their own home. Recently, Mr T fell and broke his hip. Hospital tests at the time of the fracture also revealed that Mr T had reduced bone mineral density, and so was at increased risk of further fractures. Although physiotherapy and rehabilitation were successful and he has no physical side effects from his broken hip, he is scared about falling again. This means he is reluctant to take part in his normal activities of daily living, and has become more dependent on Mrs T.

The occupational therapist, who makes regular home visits to Mr T, talked to him about using hip protectors, to give him more confidence when moving about at home. She showed him how to put it on correctly, and also explained that, although some studies of older people in residential care have shown effect in reducing hip fractures, no one really knows whether hip protectors are effective in the home. However, Mr T feels safer when wearing it, and moves around with greater confidence and steadiness. In turn, this reduces his risk of falling again and helps him to be more active.

5.2 Vitamin D and calcium supplementation

Recommendations

Assessment

- Consider adequacy of calcium and vitamin D as part of routine assessment of falls risk in older people living in the community.

Intervention

- Vitamin D and calcium supplementation should be recommended as an intervention strategy to prevent falls in older people who live in the community, particularly if they are not exposed to the minimum recommended levels of sunlight. Benefits from supplementation are most likely to be seen in people who have vitamin D insufficiency (25(OH)D <50 nmol/L) or deficiency (25(OH)D <25 nmol/L). (Level I-*)[15]

Good practice points

- Encourage older people to include high calcium foods in their diet, and exclude foods that limit calcium absorption.
- For older people with cognitive impairment who have problems with medication compliance, consider using an intermittent but high-dose preparation of vitamin D (that is, less frequent administration, but the same total dose as recommended for older people without cognitive impairment).

5.2.1 Reviewing adequacy of vitamin D and calcium

Low vitamin D levels have been associated with reduced bone mineral density, high bone turnover and increased risk of hip fracture.[157] Furthermore, vitamin D may prevent falls by improving muscle strength and psychomotor performance, independent of any other role in maintaining bone mineral density.[30,158]

One intervention that has been studied in some detail is the use of vitamin D for preventing falls. Several meta-analyses with different inclusion criteria examining the effect of vitamin D on falls in older people have reported conflicting results.[5,30,31]

The basic principles of vitamin D interventions for preventing falls are to:

- assess adequacy of vitamin D and calcium (eg using food preference records; food and fluid intake records; 25(OH)D blood levels; a history of the older person's daily routine)
- ensure minimum sun exposure to prevent vitamin D deficiency (ie 5–15 minutes exposure, four to six times per week, being careful not to have overexposure to the sun; a vitamin D supplement of at least 800 IU per day is recommended if sun exposure is not possible)
- consider vitamin D and calcium supplementation (for confirmed cases of vitamin D deficiency, supplement with 3000–5000 IU per day for at least one month)
- encourage older people to include foods high in calcium in their diets[159]
- discourage older people from consuming foods that prevent calcium absorption (analysis of food intake records or diet history should show a daily intake of calcium of 800 mg for men and 1000 mg for women).[159]

Case study

Mrs S presented to her general practitioner (GP) after falling recently at home. She lives alone and rarely goes out. As part of her falls risk assessment, the GP established that Mrs S has limited exposure to sunlight and that her diet is neither rich in vitamin D nor calcium. The GP discussed the importance of both calcium and vitamin D with Mrs S. They realised that Mrs S is unlikely to be able to maintain adequate vitamin D levels with sun exposure or diet. However, she is happy to increase the calcium content of her diet by drinking two glasses of milk, in addition to her other dietary sources of calcium. Mrs S and the GP agreed that she needs oral vitamin D supplementation and that her calcium needs will be met by altering her diet.

5.3 Osteoporosis management

Recommendations

Assessment

- Older people with a history of recurrent falls should be considered for a bone health check. Also, older people who sustain a minimal-trauma fracture should be assessed for their risk of falls.

Intervention

- Older people with diagnosed osteoporosis or a history of low-trauma fractures should be offered treatment for which there is evidence of benefit. (Level I)[160]

Good practice point

- When using osteoporosis treatments, older people should be co-prescribed vitamin D with calcium.

5.3.1 Checking bone health

Screening for osteoporosis is important for minimising falls-related injuries. It is important to recognise that people sustaining low-trauma fractures after the age of 60 years probably have osteoporosis and an increased risk of subsequent fracture.[161] Bone densitometry and specific anti-osteoporosis therapy should be considered in these people. Older people with a history of recurrent falls should be considered for a bone health check. Also, people who sustain a minimal-trauma fracture should be assessed for their risk of falls.[162]

5.3.2 Providing interventions

As discussed above, several drug treatments are available for treating osteoporosis in postmenopausal women, which may, in turn, reduce falls and associated injury. These drugs, which are considered to be the first-line treatment, include:

- oral or intravenous bisphosphonates in postmenopausal women who have low bone density[160,163]
- selective oestrogen receptor modulators in postmenopausal women with osteoporosis[164]
- strontium ranelate for preventing osteoporosis in postmenopausal women.[165]

However, there is a lack of data on drug treatment of osteoporosis in older men. Bisphosphonates can be used to reduce the risk of vertebral fractures and increase bone density in older men at risk of osteoporosis.[166] Bisphosphonates work best when co-prescribed with vitamin D and calcium.

For people with a history of recurrent falls, or those who have sustained a minimal-trauma fracture, the GP and health care team can consider strategies for optimising function, minimising the time spent on the floor after a fall, protecting bones, improving environmental safety and prescribing vitamin D.

Case study

Mrs E is a 75-year-old woman who fell, fracturing her humerus (upper arm) while walking in her home. Specific questioning revealed she had an early menopause and that she rarely goes outside because she worries about developing skin cancer. An orthopaedic surgeon treated her fracture in the local hospital. The surgeon suggested that Mrs E start taking calcium and vitamin D, and referred her to the osteoporosis clinic.


TEAM

6 Responding to falls

Good practice points

- After the immediate follow-up of a fall, determine how and why a fall may have occurred and implement actions to reduce the risk of another fall.
- It is better to ask an older person whether they remember the sensation of falling or whether they think that they blacked out, because many older people who have syncope are amnestic of the fact.
- An in-depth analysis of the fall may be required if there has been a serious injury following a fall, or if a death from a fall has occurred in the presence of a member of the health care team.

6.1 Immediate response to falls

The circumstances surrounding a fall are a critical part of care, because a fall may be the first and main indication of another underlying and treatable problem.[167] Older people who fall are more likely to fall again,[168] and a previous fall is a strong risk factor for future falls and falls injuries.[169] All members of the health care team and older people and their families should be aware of what constitutes a fall (see Section 1.1 for a definition).

It is also vital that community service staff know what to do when an older person falls, or if a client reports a recent fall to them. Local community service guidelines should also include actions to follow for moving someone who has fallen, including when to seek assistance, and reporting requirements (see the checklist, below).

However, many older people who fall may not report the fall to their general practitioner (GP) or other health professional,[170] or even to their own family. If a community services staff member notices signs that a fall may have occurred (eg unexplained bruising), they should discuss this with the older person, and emphasise the importance of being assessed by a health care professional to see whether they need treatment.

Reporting and recording the fall is an important part of care. The following checklist is a guide to what should be included in a falls incident policy or protocol for a community service (based on good practice from the hospital and residential aged care settings). Depending on the background, training and experience of the staff member from a community service, the policy may primarily involve seeking assistance (eg an ambulance) or medical review in the first instance.

Checklist 1: managing the older person immediately after a fall

Offer basic life support and provide reassurance

- Check for ongoing danger.
- Check whether the older person is responsive (eg responds to verbal or physical stimulus).
- Check the older person's airways, breathing and circulation.
- Reassure and comfort the older person.[155,167]

Check for injuries

- Conduct a preliminary assessment, including checking for level of consciousness and vital signs.[167]
- Check for signs of injury, including abrasion, contusion, laceration, fracture and head injury.[155,167,171]
- Within the capacity of background, training and experience of the staff member from a community service, assess and treat any injury, and initiate diagnostic and treatment interventions for contributing causes, or ensure medical assistance is sought.[167]

Move the older person

- Assess whether it is safe to move the older person from their position, and note any special considerations in moving them. Use a lifting device or seek help instead of trying to lift the older person alone. It may be appropriate to call the ambulance service. Follow appropriate service occupational health and safety guidelines on lifting.[167]

Monitor the older person

- Ensure ongoing monitoring of the older person, because some injuries may not be apparent at the time of the fall.[106,155]
- Observe older people who have fallen and who are taking anticoagulants or antiplatelets (blood-thinning agents), because they have an increased risk of bleeding and intracranial haemorrhage. Older people who have a history of alcohol abuse may be more prone to bleeding. The older person's general practitioner (GP) should be contacted and relevant details provided on any transfer information if an ambulance has been called.

Report the fall

- Report all falls to the older person's GP, even if injuries are not apparent.[106,171]
- At the earliest opportunity, notify the person nominated to be contacted in case of an emergency.[167,171]
- Note any details of the fall for reference in reporting the incident, including the older person's description, if possible.[167,171] At a minimum, this should include the location and time of the fall, what the older person was doing immediately before they fell, the mechanisms of the fall (eg slip, trip, overbalance, dizziness), and whether they lost consciousness or had a conscious collapse.
- Complete an incident-reporting form for all falls,[106,167,171,172] regardless of where the fall occurred, or whether the older person is injured, as per service guidelines.
- Document all details in the older person's case file (or report this information to the older person's case manager at the community agency), including their appearance or response, evidence of injury, location of the fall, notification of GP and actions taken.[155,171]

Discuss the fall and future risk management

- Communicate to all relevant staff, family and carers that the older person has fallen and has an increased risk of falling again.[171]
- Discuss the circumstances of their fall, its consequences, and actions planned to reduce future falling risk with the older person who fell, and their family.
- Assume that once an older person has fallen, they automatically become at high risk of falling again until they have been assessed.[155]

6.2 Post-fall follow-up

After the fall, determine how and why a fall may have occurred and implement actions to reduce the risk of another fall. The checklist in the following box is a guide to what steps should be included in a post-fall follow-up (or refer to the GP or other health professional for this).

Checklist 2: post-fall follow-up

- Investigate the cause of the fall, including assessing for delirium.
- Review the implementation of existing falls prevention strategies, including standard falls prevention strategies.[106,155,171]
- Undertake a falls risk assessment, because new risk factors may be present.[106,155,171]
- Implement a targeted, individualised plan for daily care, based on the findings of the falls risk assessment tool. Multifactorial interventions should be carried out as appropriate and may include, but are not limited to: gait, balance and exercise programs, footwear review, medication review, hypotension management, environmental modification and cardiovascular disorder treatment.[173] This will often involve referral to other members of the health care team.
- Encourage the older person to resume their normal level of activity, because many older people are apprehensive after a fall and the fear of falling is a strong predictor of future falls.[174]
- Consider the use of injury-prevention interventions.[106,155,171] For example, discuss with the GP the use of hip protectors, and vitamin D and calcium supplementation.
- Consider investigations for osteoporosis in the presence of low-trauma fractures.
- Ensure effective communication of assessment and management recommendations to everyone involved.[106,155,171]

6.3 Analysing the fall

An in-depth analysis of a fall is sometimes known as a root-cause analysis. In a hospital or residential aged care setting, where a duty of care exists, a root-cause analysis is always required if a fall causes death. Also, reporting falls is mandatory in these settings. However, if an older person living in the community dies because of a fall, service providers are not necessarily expected to conduct a root-cause analysis. The death certification process by the attending medical practitioner will address the necessary reporting requirements (eg the report to the coroner).

Each community service should have a review process in place.

6.4 Reporting and recording falls

After a fall, it is important that all members of the older person's health care team, the older person themselves, and their carer, know about the fall and the factors that might have caused it.

It is useful for service providers to have guidelines for reporting falls. These guidelines should identify the person to whom falls should be first reported (eg service coordinator, GP, person responsible in case of an emergency). The guidelines should also state clearly what level of information should be collected and reported, and this should be relevant to the type of service being provided. For example, a personal care attendant may simply report a fall to their service coordinator, while a community nurse may collect and report detailed information about a fall to the older person's GP.

The following checklist is a guide to what items could be included.[175]

Checklist 3: data that may form part of falls recording

- Demographic details of the older person (including date of birth).
- Current and relevant diagnoses or problems.
- Date, time and place of the fall.
- Type of incident (eg slip, trip, bumping into or falling on an object).
- Activity at time of the incident (eg attempting to stand, walking).
- Whether the older person is independent or dependent on a carer or aids.
- Steps taken previously to reduce falls risk and injury risk.
- Any recent change in medications that might be associated with falls risk.
- Relevant information about clothing, footwear, eyewear and mobility aids, used at the time of the fall.
- Factors contributing to the incident, such as environmental conditions (eg floor, lighting, clutter).
- Status after the fall (eg baseline observations, injuries).
- Interventions to be used after the fall, and medical treatment required.
- The older person's perception of the fall, including description of any preceding sensations or symptoms and what they think could have prevented the fall.
- Any witnesses to the fall.
- Any other comments.

To achieve the most accurate information about the fall, the description of the fall should also allow for free text. There should be room on the reporting or incident form for additional comments to be made.

6.5 Comprehensive assessment after a fall

Older people who fall repeatedly and people prone to injurious falls require a comprehensive and detailed assessment.[173] For a more detailed assessment, the older person should be referred to a specialist (eg geriatrician) where possible.

Older people who present for medical attention because of a fall, report recurrent falls in the past year, or demonstrate abnormalities of gait or balance should be assessed for their risk of falls.[173] This assessment should be done by a clinician with appropriate skills and experience, which may require a referral to a specialist (eg geriatrician).

The falls assessment should include:[173]

- taking a history of fall circumstances, medications, acute or chronic medical problems, and mobility levels
- examining vision, gait and balance, and lower extremity joint function
- examining basic neurological function, including mental status, muscle strength, lower extremity peripheral nerves, proprioception, reflexes, and testing cortical, extrapyramidal and cerebellar function
- assessing basic cardiovascular status including heart rate and rhythm, postural pulse and blood pressure and, if appropriate, heart rate and blood pressure responses to carotid sinus stimulation.

6.6 Loss of confidence after a fall

A common but often overlooked consequence of a fall is a loss of confidence in walking, or fear of falling,[176] which can occur even in the absence of any injury. In the period after a fall, the health care team should observe the older person who has fallen to note any change in usual activity that might indicate the presence of, or increase in, fear of falling. Discussion with the older person about any concerns about falling might also be an opportunity to identify the presence of fear.

In community settings, common approaches to improving loss of confidence or fear of falling include participation in a balance and mobility training exercise program, and other falls prevention activities, including use of hip protectors.[176,177]

6.7 Falls clinics

Falls clinics are conducted by a multidisciplinary team with skills in falls assessment and management for people who have fallen.[178] There are limited numbers of falls clinics available and a referral is usually required. Usually the falls clinic is conducted as a part of an outpatient service. The team usually develops an intervention strategy for the older person, as well as advice, education and training for the older person, their carer and other members of the health care team. Falls clinics can also refer the older person to mainstream services for ongoing management.

Falls clinics should not be the first intervention for an older person who has fallen, or is at risk of falling.

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Notes