# Best practice approaches to minimise functional decline in the older person across the acute, sub-acute and residential aged care settings

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Disclaimer

Clinical practice guidelines are just one element of good health care decision making, which also takes into account patient/resident preferences and values, clinician values and experience, and the availability of resources.

These guidelines are not a definitive statement, but rather constitute a general guide to be considered in preventing functional decline in older people. Some flexibility will be required to adapt these guidelines to specific settings, local circumstances and individual patient/ resident needs.

Every attempt was made to ensure the accuracy of the contents of these guidelines at the time of publication. In addition, the authors have made every effort to identify all the current, relevant guidelines, systematic reviews and randomised controlled trials. However, the authors acknowledge they might not have identified some relevant literature.

The Clinical Epidemiology and Health Service Evaluation Unit or any person who has contributed to the guidelines development do not accept liability or responsibility for any loss damage, injury or expense arising from any errors of omission in the contents of these guidelines.

# Contents

# Definition of terms

# Definition of terms

**acute, sub-acute and residential aged care**

These terms are not used consistently across Australia. For the purposes of this document:

- term 'acute' refers to acute care hospitals
- term 'sub-acute' refers to rehabilitation hospitals, geriatric and evaluation management units, step-down, transition, and interim care units
- term 'residential aged care facilities' refers to low level facilities (hostels) and high level facilities (nursing homes).

**patient, resident and client**

For the purpose of this document, the term 'patient' refers to both patients and clients in acute and sub-acute settings. 'Resident' is used to refer to people receiving care in residential care settings.

**deconditioning**

Physiologic changes following a period of inactivity or low activity that can result in functional decline, for example, muscle weakness or reduced endurance. The age related decline of physiologic systems in older people means they experience a decrease in reserve capacity which renders them more susceptible to deconditioning (1).

**functional decline**

Reduced ability to perform tasks of everyday living, for example, walking or dressing, due to a decrement in physical and/or cognitive functioning (2)

**stakeholder**

All individuals or groups who will be directly or indirectly affected by the change or solution to the problem. Within this context, stakeholders include older people (their family and friends), health care providers (staff and managers across all sectors), and the funders of health care and residential care.

**interdisciplinary approach to care**

Where team members from different disciplines individually collect assessment information, **but** collectively define the main issues, set management goals and develop and implement care plans. An effective team will operate within a climate that encourages the sharing of information among disciplines and a spirit of cooperation.

**consensus**

A process for making policy decisions, not a scientific method for creating new knowledge. At its best, consensus development merely makes the best use of available information, be it scientific data or the collective wisdom of the participants.

# Prevention of functional decline process model

These guidelines do not describe the management of pre-existing conditions. As outlined in the process model (below), these guidelines are aimed at strategies that prevent or minimise the risk of functional decline. The process model outlines the broad principles of risk assessment and risk management, which include identifying individuals 'at risk' and associated risk factors, implementing strategies aimed at reducing or eliminating risk factors and protecting the individual from potential further risk, and continually evaluating the effectiveness of the care delivered.

## Figure 1: Process Model for Preventing Functional Decline in Older People

## Figure 2: Prevention of functional decline framework



**Maintain Wellbeing of Older Person at Risk**

Consider: Cultural Beliefs, Polypharmacy, Environmental Factors

Aim to maintain these indicators:
- Cognition & Emotional Health
- Mobility, Vigour & Self-care
- Continence
- Nutrition
- Skin Integrity

By preventing these proximal outcomes:
- Cognition & Emotional Health
  - Delirium
  - Confusion
  - Depression
  - Demoralisation
- Mobility, Vigour & Self-care
  - Loss of muscle strength
  - Loss of endurance
  - Loss of balance
- Continence
  - Faecal & urinary incontinence
- Nutrition
  - Inadequate micronutrition
  - Inadequate macronutrition
  - Dehydration
- Skin Integrity
  - Immobility
  - Malnutrition
  - Excessive pressure

**Functional Decline**

Which result in these distal outcomes:
- Dependency
- Isolation
- Anxiety
- Apathy
- Falls
- Fractures
- Pain
- Fear
- Loss of confidence
- Fatigue
- Disorientation
- Skin Breakdown
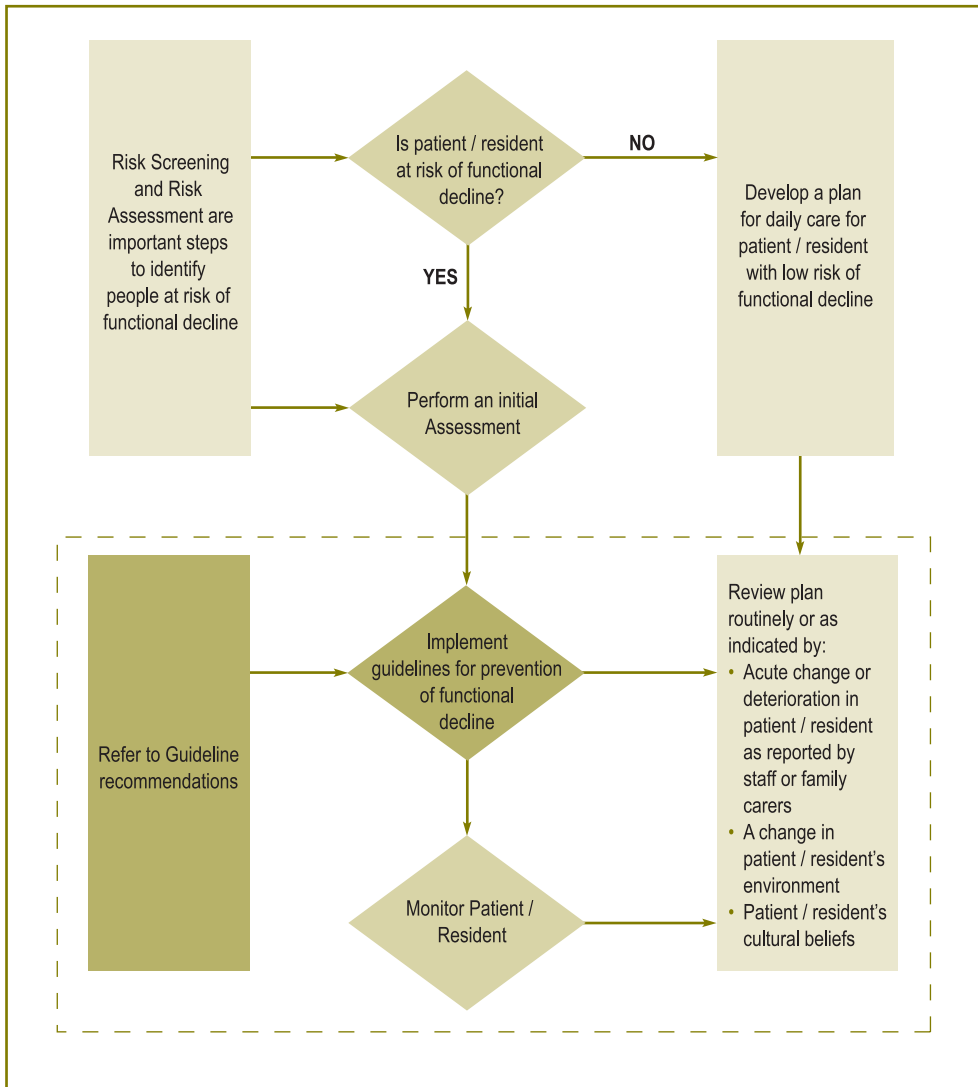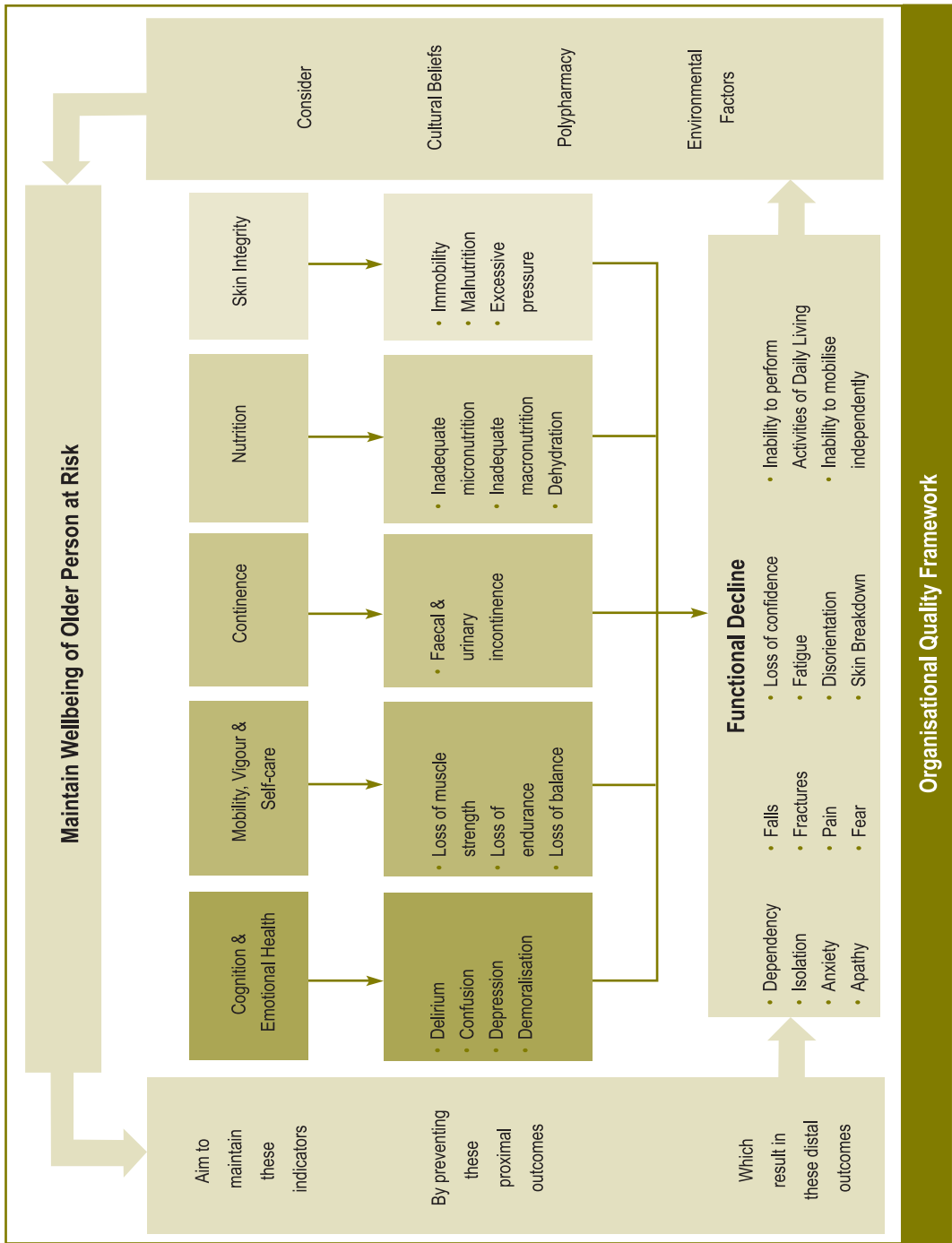- Inability to perform Activities of Daily Living
- Inability to mobilise independently

**Organisational Quality Framework**

# Quick guide

This **Quick Guide** provides an overview of recommendations for prevention of functional decline and the evidence that underlies recommendations for specific intervention and management strategies in each domain. Page references to corresponding sections in the comprehensive guideline have been provided.

## What is functional decline? (Section 1.1)

Functional decline is defined as a decrement in physical and/or cognitive functioning (1). The age related functional decline of physiologic systems means that older people experience a decrease in reserve capacity, which renders them more susceptible to deconditioning. The cumulative nature of the functional decline that occurs with ageing and the deconditioning imposed on an older person with bed rest or immobility can thrust those who are vulnerable into a state of irreversible functional decline.

## Who will use the guidelines? (Section 1.4)

These guidelines were developed for those who deliver and are responsible for patient/resident care. This includes clinical, management, corporate and environmental services staff.

## What is the purpose of the guidelines? (Section 1.2)

The purpose of these guidelines is to provide recommendations about interventions and management strategies for preventing functional decline in older people in the acute, sub-acute and residential aged care settings. The overall objectives of the guidelines are to:

- provide older people with healthcare that is person-centred and evidence-based
- ensure the best possible health outcomes for older people
- improve the function and quality of life of older people in acute, sub-acute and residential aged care.

These guidelines were developed using the best available research findings and, where research gaps exist, consensus processes.

## What components of care are included in the guidelines? (Section 1.3)

The focus of these guidelines is on intervention and management strategies to prevent functional decline in older people in the acute, sub-acute and residential aged care settings in the domains of;

- Cognition and Emotional Health
- Mobility, Vigour and Self-Care
- Continence

- Nutrition
- Skin Integrity

Levels of evidence of effectiveness (NHMRC classification) (3) describe the strength of the research evidence supporting each recommended strategy to prevent functional decline (see Table 1, Section 1.7))

## What other care components should be considered when trying to prevent functional decline? (Sections 1.10, 1.11, 1.12)

Other factors that influence an older person's ability to maintain function should be considered in conjunction with the recommendations outlined in these guidelines. These include cultural beliefs and individual diversity, polypharmacy and environmental factors. All of these influence the health and wellbeing of older people across all sectors of the health system and therefore need to be considered in management strategies.

## How can these guidelines recommendations be implemented and evaluated?

If guidelines are to have maximum impact, they need to form one element of an integrated quality planning and improvement strategy rather than be developed and implemented in isolation. To ensure the guidelines' effectiveness and to enable better health outcomes for patients/residents, implementation of these guideline recommendations should be integrated with appropriate risk screening and comprehensive risk assessment processes. Links to available guidelines are provided in the Quick Guide and Comprehensive Guide to facilitate this process.

Guideline recommendations should be integrated into workflow practice (for instance using clinical pathways). They are more likely to be associated with sustained effectiveness if they are integrated with broader organisational activities, such as continuing professional education, quality assurance, performance monitoring and accreditation, to promote and improve the quality of care at the local level. The guidelines also need to be embedded into an organisational quality framework which ensures adequate access to guideline recommendations, regular review of adherence to guideline recommendations, and appropriate updating of guidelines at least every three to five years.

The National Health and Medical Research Council has published information about implementing clinical practice guidelines (3) that can be accessed via the internet at http://www.nhmrc.gov.au/publications/synopses/cp30syn.htm.

These guidelines do not specifically address the financial implications of their recommendations' full implementation; however, many of the recommendations require small changes in staff practice, which can be implemented without substantial resource allocation.

Planning a guideline evaluation should commence in association with the implementation planning phase. For sustained effectiveness, an evaluation plan should include assessment of structure (relationship of guidelines to organisational quality framework and management processes), process (dissemination and implementation strategy review, review of integrative tools) and outcomes (including patient health, patient and staff satisfaction, and health care use and cost outcomes).

# Cognition and Emotional Health    *2*

## Summary and recommendations

| COGNITION AND EMOTIONAL HEALTH |
|---|
| Subjective wellbeing is defined as positive evaluation of one's life associated with positive feelings. |
| Cognitive impairment can result from a number of conditions, including dementia, delirium and depression. |
| Delirium is an acute organic disturbance of higher cerebral function associated with impaired ability to attend to the environment.<br><br>• The prevalence of delirium in older people on admission to hospital ranges between 10 per cent and 24 per cent and new cases arise in 6–56 per cent  of older patients during hospitalisation.<br><br>• Overall, it appears prevention of delirium is more efficacious than early detection and treatment. |
| Dementia is a general term used to describe a form of cognitive impairment that is chronic, generally progressive and occurring over a period of months to years.<br><br>• Forty-five per cent of people with moderate to severe dementia are living in residential aged care facilities.<br><br>• The disability burden from dementia in Australia was found to be the second highest of any disease. |
| Depression is a multifaceted syndrome, comprising a constellation of affective, cognitive, somatic and physiological manifestations in varying degrees from mild to severe.<br><br>• The incidence in long-term care settings is three to four times higher than in the general population. |

| RECOMMENDATIONS |
| --- |
| Assess cognitive status (delirium, dementia and depression) including premorbid status |
| Consider the need for specialist geriatric or psychiatry assessment. |
| Perform proactive assessment for delirium risk. |
| Provide optimal pain management. |
| Implement measures to prevent cognitive functional decline:<br>• Undertake early medical evaluation.<br>• Encourage physical activity.<br>• Undertake medication review.<br>• Optimise environmental stimulation and familiarity with surroundings.<br>• Consider behavioural and psychosocial interventions. |
| Consider disease-specific pharmacological interventions for dementia and depression. |
| Consider transitional care needs and community-based strategies for people discharged from hospital and residential care. |
| Include and consider patient/resident's carer or family. |

## Links to delirium, dementia and depression specific guidelines

Current guidelines addressing aspects of delirium and depression include:

• Registered Nurses Association of Ontario 2003, Screening for delirium, dementia and depression in older adults, RNAO, Ontario. *<www.rnao.org/bestpractices >*

• Registered Nurses Association of Ontario 2004, Caregiving strategies for older adults with delirium, dementia and depression. RNAO, Ontario. *<www.rnao.org/bestpractices>*

## Summary of the evidence

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain optimal cognitive function** | **Prevent demoralisation** | **Maintain emotional health** |
| **Delirium** | | | |
| *Multicomponent strategy* | + | | |
| **Level II evidence:** Standardised protocols for the management of six established risk factors for delirium (cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment and dehydration) significantly reduced the number and duration of episodes of delirium in hospitalised older patients (4, 5). Methodological constraints apply, with poor methodology and heterogeneity. | | | |
| *Proactive geriatric consultation* | + | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial which indicated that a proactive geriatrics consultation, including reference to adequate oxygen delivery, fluid/electrolyte balance, treatment of severe pain, elimination of unnecessary medications, regulation of bowel and bladder function, adequate nutritional intake, early mobilisation and rehabilitation, prevention, detection and treatment of major post-operative complications, appropriate environmental stimuli and treatment of agitated delirium, reduced the risk of delirium development (particularly severe delirium) after hip fracture (5, 6). | | | |
| **Physiological interventions** | | | |
| *Nurse-led interdisciplinary intervention program* | + | | |
| **Level II evidence:** Education of nursing staff, systematic cognitive screening, consultative services by a delirium resource nurse, a geriatric nurse specialist or psycho-geriatrician and use of a scheduled pain protocol resulted in a shorter duration and lower severity of delirium in the intervention cohort (5, 7). | | | |
| *Sleep–wake cycle* | ± | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial which indicated that delirium could be prevented by improving the post-operative sleep–wake cycle by using a combination of benzodiazepines and an opioid. The intervention was not associated with severe complications or side effects, but morning lethargy was observed in 40 per cent of patients (5, 8). However, expert opinion suggests other options should first be considered and the use of medication to manage the sleep–wake cycle should be a last resort due to the effect of opioids and benzodiazepines on older patients/residents. | | | |

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain optimal cognitive function** | **Prevent demoralisation** | **Maintain emotional health** |
| *Pain management* | + | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial where patient controlled analgesia virtually eliminated the occurrence of delirium in the frail elderly surgical patient (9). | | | |
| **Pharmacological interventions** | | | |
| *Reduce or eliminate non-essential medication* | ± | | ± |
| **Expert opinion:** The reduction or elimination of non-essential medication can reduce episodes of delirium. Special attention should be given to those medications known to contribute to delirium. Evaluation and monitoring of pharmacological measures should occur, including rationalisation (10). | | | |
| **Environmental interventions** | | | |
| *Optimise environmental stimulation* | ± | ± | ± |
| **Expert opinion:** Optimisation of environmental factors, including stimulation, sensory impairments, familiarisation and orientation, allow delirium to be managed (10). | | | |
| **Educational interventions** | | | |
| *Tailor disease-specific information* | ± | ± | ± |
| **Expert opinion:** Assessing individual educational needs of the client and the care giver enhances the understanding of the condition (10). | | | |
| **Communication and emotional support** | | | |
| *Maintain a supportive therapeutic relationship* | ± | ± | ± |
| **Expert opinion:** Consideration of the client's and carer's needs enhances the management of delirium (10). | | | |
| DEMENTIA (Section 2.3) | | | |
| **Psycho-social interventions** | | | |
| *Consider the patient* | ± | ± | ± |
| **Expert opinion**: Relations between the carer and client are facilitated when their abilities are recognised and the environment in which they are surrounded is understood (10). Counselling the patient/resident and family can assist with symptom management and acceptance (11). | | | |

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain optimal cognitive function | Prevent demoralisation | Maintain emotional health |
| **Pharmacological management** | | | |
| *Oestrogen replacement therapy* | – | | |
| **Level II evidence**: A randomised controlled trial of 4,532 post-menopausal and dementia-free women identified that those taking a combined oestrogen and progesterone tablet had an increased risk of probable dementia (12). | | | |
| *Non-steroidal anti-inflammatory drugs (NSAIDs)* | ± | | |
| **Level III-2 evidence**: A meta analysis of six cohort and three case-control studies found that non-steroidal anti-inflammatory drugs gave some protection against the development of Alzheimer's disease (13). | | | |
| *Aspirin* | ± | | |
| **Expert opinion:** A Cochrane Review was unable to identify that aspirin has an effect on vascular dementia, despite its wide use in practice (14). | | | |
| *Statins* | ± | | |
| **Expert opinion:** Lipid lowering statins may prevent the development of dementia via indirect effects of stroke prevention (15). | | | |
| *Antihypertensives* | + | | |
| **Level II evidence:** Two randomised controlled trials have found that long term use of antihypertensives reduces the risk of dementia and cognitive decline (16, 17). | | | |
| *Anticholinesterase* | + | | |
| **Level I evidence:** Two meta analyses identified that cholinesterase inhibitors have a positive effect on delaying and minimising the decline in dementia (18, 19). These drugs work most effectively in mild to moderate Alzheimer's disease. | | | |
| *Neuroleptics* | ± | | ± |
| **Expert opinion:** The method of treatment is often chosen with the side effects in mind (20). | | | |
| **Natural alternative treatment** | | | |
| *Antioxidant vitamins* | + | | + |
| **Level II evidence:** A randomised controlled trial suggests cognitive function in older people taking oral supplementation of vitamin E is improved compared with placebo (21). It has been proposed that high dietary intake of vitamin E is associated with lowering the risk of Alzheimer's disease (15, 20). | | | |

## COGNITION AND EMOTIONAL HEALTH

| INTERVENTIONS | Goals of management | | |
|---|---|---|---|
| | Maintain optimal cognitive function | Prevent demoralisation | Maintain emotional health |
| *Ginkgo biloba* | ± | | ± |

**Expert opinion:** A Cochrane Review identified there is promising evidence of improvement in cognition and function, however, results are inconsistent. There is need for a large trial using modern and more robust methodology (22).

### Non-pharmacological interventions

| | | | |
|---|---|---|---|
| *Non-pharmacological interventions* | ± | | ± |

**Expert opinion:** Interventions that focus on the stimulus of the behavioural symptoms are beneficial.

| | | | |
|---|---|---|---|
| *Reality orientation classes* | + | | |

**Level I evidence:** Reality orientation classes (ten sessions in three weeks) have a positive effect on community-dwelling elderly with dementia. This might be able to be extrapolated into sub-acute and residential care settings (23).

## DEPRESSION

| | | | |
|---|---|---|---|
| *Target known risk factors* | + | | + |

**Level I evidence:** A systematic review identified risk factors among community-dwelling adults such as bereavement, sleep disturbance, disability, prior depression and the female gender. Screening individuals to identify those at risk might provide the opportunity to reduce the risk of depression (24).

| | | | |
|---|---|---|---|
| *General management principles* | ± | | ± |

**Expert opinion:** The general management principles include monitoring for self-harm, educating the patient and carer, treating the whole person, treating the depressive symptoms and prompt referral (25).

| | | | |
|---|---|---|---|
| *Relapse prevention program* | + | | |

**Level I evidence:** A relapse prevention program targeted at primary care patients with a high risk of relapse/recurrence who had largely recovered after antidepressant treatment significantly improved antidepressant adherence and depressive symptom outcomes (26).

| | | | |
|---|---|---|---|
| *Depression care managers* | + | | |

**Level I evidence:** A combination of a clinical algorithm for treating geriatric depression and treatment management by depression care managers was effective in reducing suicidal ideation and depressive symptoms in patients with major depression and, when suicidal ideation was present, minor depression (27).

| | | | |
|---|---|---|---|
| *Exercise* | + | | + |

**Level I evidence:** Two randomised controlled trials demonstrated that exercise can affect depressive symptoms of older adults in a positive way in the community setting (28, 29). A systematic review identified that mood in elderly people who participate in exercise or physical activity is significantly improved compared with those who do not (30). Another systematic review identified that physical activity might enhance total sleep duration, sleep onset latency and global sleep quality, therefore enhancing quality of life in the aged (31).

# Mobility, Vigour and Self-Care

*3*

## Summary and recommendations

| MOBILITY, VIGOUR AND SELF-CARE |
|---|
| The ability to walk, climb stairs, transfer in and out of bed, shower, dress and toilet is related to an older person's level of strength, balance and endurance. <br><br> • The rate of loss in strength might be as high as 5 per cent a day with bed rest and is greater in the lower limbs than in the upper limbs. <br><br> • Effective balance is important to reduce the likelihood of falling in situations when balance is threatened. <br><br> • Reduced aerobic capacity can occur with prolonged periods of bed rest. |
| Age related functional decline of physiologic systems means that older people are more susceptible to deconditioning; however, deconditioning is manageable with regular exercise. |
| Reduced mobility and falls can result from poor balance, reduced muscle strength and lack of endurance. <br><br> • In the acute hospital setting, fall rates of between two and seven falls per 1,000 bed days have been reported. <br><br> • In sub-acute care, up to 46 per cent of patients from high risk clinical groups (such as those who have suffered stroke) fall, while fall rates in residential care settings are often considerably higher, in the range of 30–50 per cent. |
| **Falls can also have psychological and social consequences. Recurrent falls are a common reason for admission to residential aged care.** |

| RECOMMENDATIONS |
|---|
| Perform a comprehensive assessment for falls and fracture risk, mobility and functional status |
| Develop an individualised care plan, encourage appropriate incidental activity throughout the day and minimise bed rest. |
| Assess and modify the environment to encourage independence and mobility. |
| Consider referral to a physiotherapist or occupational therapist for:<br>• individual or group exercise training for muscle strength, endurance and balance<br>• retraining of activities of daily living. |
| Maintain nutritional supplementation in combination with strengthening exercises to improve strength. |
| Provide supervision of walking and transfers in those identified to be at risk of falling. |
| Consider transitional care needs and community-based strategies for minimising post-discharge falls and maintaining ongoing strength, mobility and vigour. |

## Links to falls specific guidelines

• American Geriatrics Society, British Geriatrics Society & American Academy of Orthopaedic Surgeons 2001, 'Guideline for the prevention of falls in older persons', *Journal of the American Geriatrics Society,* vol. 49, no. 5, pp. 664–72.

• Queensland Health 2003, *Falls prevention: best practice guidelines for public hospitals and state government residential aged care facilities incorporating a community integration supplement*, Queensland Health, Brisbane.
<http://www.health.qld.gov.au/fallsprevention/best_practice/falls_best_practice.pdf> [Currently being updated.]

• Victorian Quality Council 2004, *Minimising the risk of falls and fall-related injuries: guidelines for the acute, sub-acute and residential care settings*, Department of Human Services, Melbourne.
<http://www.health.vic.gov.au/qualitycouncil>

## Summary of the evidence

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| MOBILITY, VIGOUR AND SELF-CARE | | | |
| --- | --- | --- | --- |
| | Goals of management | | |
| INTERVENTIONS | Maintain muscle strength | Maintain endurance | Maintain balance |
| **Exercise interventions** | | | |
| *Incidental activity* | ± | | |
| **Expert opinion:** Increasing the number and amount of incidental activities during the day can help maintain muscle mass, strength and mobility and reduce agitation in older people in residential care (32). | | | |
| *Progressive resistance training (strength)* | + | | |
| **Level 1 evidence:** A systematic review identified that progressive resistance training appears to be an effective intervention to increase strength in older people and has a positive effect on some functional outcomes (33). | | | |
| *Endurance training* | | + | |
| **Level I evidence:** A meta analysis identified that endurance training significantly increases functional capacity in the older community-dwelling person and that the increase is related to subject age, duration of exercise bouts, length of training regimen and pre-training maximum oxygen consumption (34). Further investigation is warranted regarding frequency, duration and intensity of training (34). | | | |
| *Balance training* | | | + |
| **Level II evidence:** To improve balance performance, exercise needs to have a balance component, not just strength training (35). Exercises need to be specific to the level of function, which is to be achieved. Balance exercises lead to improvements in static balance function, while gait exercises result in improved dynamic balance and gait functions (36). Sitting balance exercises are insufficient to effect dynamic balance (37). | | | |
| *Tai chi* | | | + |
| **Level I evidence:** Two systematic reviews identified evidence supporting the use of tai chi to improve balance and postural control (38, 39). Practicing tai chi for a period of 15 weeks has a positive effect on fear of falling and reduces risk of falling (38). A recent randomised controlled trial used tai chi in 311 frail, older residents of residential aged care settings and while it found that falls were not reduced, it identified a positive trend indicating further research is required in this area (40). | | | |
| Physiotherapy and occupational therapy | + | + | + |
| **Level II evidence:** Two randomised controlled trials identified that individualised programs, which often include strength, balance and functional retraining, have been shown to increase mobility and reduce the use of assistive devices in residential care settings (41, 42). | | | |

## MOBILITY, VIGOUR AND SELF-CARE

| INTERVENTIONS | Goals of management | | |
|---|---|---|---|
| | Maintain muscle strength | Maintain endurance | Maintain balance |
| *Walking aid* | | | + |
| Level II evidence: Walking aids have been shown to reduce falls in those with intermediate levels of activity (43). | | | |
| *Group exercises* | + | + | + |
| Level II evidence: Two randomised controlled trials have demonstrated that group exercises that incorporate balance, strengthening, aerobic and functional activities have achieved improved mobility and function in older people in sub-acute hospital and residential care settings (44, 45). | | | |
| *Exercise program via allied health assistant* | + | | |
| Level II evidence: A randomised controlled trial of 180 older general medical patients (aged 65 years or older) demonstrated improved functional outcomes and reduced length of stay for patients who participated in an exercise program while an inpatient (46). | | | |
| **Nutrition** | | | |
| *Nutritional supplementation* | + | | |
| Level II evidence: Progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in long term care (47). | | | |
| **Falls-specific interventions** | | | |
| *Multidisciplinary, multifactorial, health/ environmental risk factor screening and intervention* | + | + | + |
| **Level I evidence:** A systematic review of 21 studies identifying effects designed to reduce falls in older people across the community, hospital and residential settings identified complex interventions as likely to be beneficial (48). These complex interventions varied in their details of the assessment, referral and treatment protocols; however, in most studies a nurse or other trained health professional made an initial assessment and the patients/ residents were provided with advice and referral to appropriate health providers (48). A systematic review of ten studies (three randomised controlled trials and seven prospective studies) involving risk assessment, an education or awareness program, equipment checks, labels or bracelets for high risk patients, and use of alarms, restraints or a tailored nursing care plan, demonstrated that particular interventions within a prevention program were equally effective at reducing falls in hospital (49). Poor sample size and study quality limited the power calculations (49). **Level II evidence** suggests that multifactorial interventions in residential settings should include staff education programs, gait training and advice on the appropriate use of assistive devices, and review and modification of medications, especially psychotropic medications (50). The evidence is insufficient to extrapolate findings to the acute sector (50). A randomised controlled trial demonstrated a reduction in falls in an intervention group, which included a multitargeted intervention, including a falls risk alert card, exercise, education and hip protectors (45). | | | |
| *Supervision* | | | ± |
| **Expert opinion:** Always supervise the person when they are walking or making transfers if they require assistance, are acutely unwell (51) or have increased falls. | | | |

# Continence

*4*

## Summary and recommendations

| CONTINENCE |
|---|
| Continence is the capacity to pass urine or faeces in socially and hygienically acceptable circumstances. |
| Urinary incontinence can be transient or established. Faecal incontinence frequently co-exists with urinary incontinence and might have a shared aetiology. |
| Thirty per cent of women and 20 per cent of men aged 60 years or more and 42 per cent of women and 44 per cent of men aged 75 years or more suffer urinary incontinence. |
| In the community-dwelling population aged over 65 years, faecal incontinence occurs at least once a week in 3.7 people of people, and the rate is substantially greater for residents of aged care homes (10.3 per cent). |
| Urinary and faecal incontinence can already be present on admission to acute and sub-acute care and, in association with other problems, such as cognitive impairment and mobility impairment, is a significant contributing factor to decisions for admission to residential aged care. |

| RECOMMENDATIONS |
|---|
| Assess older people on admission for the presence of established urinary and faecal incontinence |
| Assess risk for transient urinary and faecal incontinence. |
| Assess need for indwelling urinary catheter. |
| Maintain hydration. |
| Modify environmental factors. |
| Encourage mobilisation and activity. |
| Consider specialist assessment for guidance on interventions appropriate to person and setting, including:<br>• behavioural interventions, such as toileting assistance or bladder training<br>• physical interventions, such as pelvic floor muscle training<br>• pharmacological interventions<br>• surgical interventions or other devices. |
| Consider transitional care needs and community-based strategies. |

## Links to continence specific guidelines

These current guidelines exist:

- National Ageing Research Institute 2004, *Continence clinic service guidelines: service guidelines for Victorian continence clinic services*, NARI, Melbourne, Australia.

- Registered Nurses Association of Ontario 2003, *Promoting continence using prompted voiding,* RNAO, Toronto, Canada. <www.rnao.org/bestpractices/PDF/BPG_Continence.pdf>

- Royal Australian College of General Practice Western Australian Research Unit 2002, *Managing incontinence in general practice: clinic research guidelines,* (edited version), Commonwealth Department of Health and Ageing, Canberra, Australia.

- Rao, SC 2001, *Practice guidelines: diagnosis and management of faecal incontinence,* American College of Gastroenterology, Iowa, USA

## Summary of the evidence

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain urinary continence** | **Maintain faecal continence** | **Maintain appropriate use of an indwelling catheter** |
| **URINARY INCONTINENCE** | | | |
| **Indwelling catheters** | | | |
| *Avoid indwelling catheters where possible* | | | + |
| **Level III-2 evidence:** A causal relationship exists between indwelling catheters and urinary tract infection. Review indication for indwelling catheters daily (52). | | | |
| *Use silver alloy indwelling catheters* | | | + |
| **Level I evidence:** A systematic review suggests silver alloy coated indwelling catheters reduce the risk of urinary tract infection in the short term for hospitalised older people (53). Further economic evaluation is required to confirm that the reduction in infection compensates the cost of silver alloy catheters (53). | | | |
| **Behavioural interventions** | | | |
| *Habit retraining* | ± | | |
| **Level I evidence:** There is insufficient quality of evidence to provide a firm basis of evidence in residential aged care and home settings. There is often overlap between habit retraining and other toileting regimens (54, 55). There should be attempts to determine the micturition pattern for the individual, however, the individual does not have to be an active participant (56). | | | |
| *Prompted voiding* | + | | |
| **Level I evidence:** Limited evidence from five randomised controlled trials suggests prompted voiding increases self-initiated voiding and reduces episodes of incontinence in the short term (56). It is used to teach people with or without cognitive impairment to initiate their own toileting and requires the participation of the individual (56). A prompted voiding schedule requires a three-day voiding record initially to determine the client's toileting needs (57). | | | |
| *Timed toileting* | ± | | |
| **Level I evidence:** A systematic review identified that data were limited and of insufficient quality to provide empirical support for or against the intervention of timed voiding, although timed voiding in combination with other interventions has been shown to reduce incontinence (56, 58). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Address constipation and faecal impaction* | ± | ± | |
| **Expert opinion:** There is consensus that constipation directly affects continence (57). Refer to the Registered Nurses Association of Ontario nursing best practice guideline, Prevention of constipation in the older adult population <http://www.rnao.org.au>. | | | |
| *Pelvic floor muscle training* | + | | |
| **Level II evidence:** One randomised controlled trial demonstrated a reduction in stress urinary incontinence by 48 per cent following six months of pelvic floor exercises without biofeedback (59). A systematic review identified that pelvic floor muscle training appeared to be an effective treatment for adult women with incontinence; however, methodological limitations existed (60). Pelvic floor muscle training in the older adult might not be as effective, depending on cognitive factors. | | | |
| *Bladder training with biofeedback* | + | | |
| **Level I evidence:** Bladder training using biofeedback techniques reduced the urinary accidents for stress, urge and mixed incontinence significantly in three randomised controlled trials (59). | | | |
| **Pharmacological interventions** | | | |
| *Anticholinergic drugs* | + | | |
| **Level I evidence:** Use of anticholinergic drugs in overactive bladder syndrome results in statistically significant improvement in symptoms. Dry mouth is a common side effect (61). | | | |
| *Adrenergic drugs* | ± | | |
| **Level I evidence:** Adrenergic drugs have a weak evidence base to support their use over placebo (62). | | | |
| *Tricyclic antidepressant therapy* | ± | | |
| **Level II evidence:** Few randomised controlled trials have been performed on tricyclic antidepressant therapy with small sample sizes. Effects have been found in nocturia in children and adult incontinence (63, 64). | | | |
| **Surgical interventions for women** | | | |
| *Open retropubic colposuspension* | + | | |
| **Level I evidence:** A systematic review identified that open retropubic colposuspension is the most effective treatment modality for stress urinary incontinence, especially in the long term. Laparoscopic colposuspension should allow speedier recovery, but its relative safety and effectiveness is unknown (65). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain urinary continence** | **Maintain faecal continence** | **Maintain appropriate use of an indwelling catheter** |
| *Periurethral injection therapy for urinary incontinence in women* | + | | |
| **Level I evidence:** A systematic review suggests that periurethral injection of established manufactured bulking agents results in subjective and objective short term improvements of symptomatic female stress urinary incontinence. Further evidence of the patient benefits and cost effectiveness, as well as long term outcomes, is required (66). | | | |
| *Tension-free vaginal taping* | + | | |
| **Level II evidence:** A randomised controlled trial demonstrated that at six months post-operatively, this procedure is as effective as colposuspension, although operative complications are more common with vaginal tape (67). Post-operative complications were more common with colposuspension (67). | | | |
| **Other interventions** | | | |
| *Absorbent products* | + | + | |
| **Level I evidence:** A systematic review identified that disposable products might be more effective than non-disposable products in decreasing the incidence of skin problems, and super-absorbent products might perform better than fluff pulp products; however, tentative conclusions can only be drawn due to poor quality studies (68). | | | |
| *Weighted vaginal cones* | ± | | |
| **Level I evidence:** A systematic review identified 15 studies that assessed weighted vaginal cones. It demonstrated there was some evidence that weighted vaginal cones are better than no active treatment in women with stress incontinence and might be of similar effectiveness to pelvic floor muscle training and electro-stimulation (69). | | | |
| *Post-prostatectomy urinary incontinence interventions* | + | | |
| **Level I evidence:** A systematic review of ten trials identified that there might be some support for pelvic floor muscle training with biofeedback post radical prostatectomy in the early post-operative period (70). | | | |
| *Oestrogens for urinary incontinence in women* | + | | |
| **Level I evidence:** A systematic review identified that oestrogen can improve or cure incontinence and the evidence suggests this is more likely with urge incontinence. Further research into oestrogen type, dose and route of administration needs to occur. Risk of endometrial and breast cancer after long term use suggests oestrogen treatment should be for limited periods, especially for women with an intact uterus (71). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| **FAECAL INCONTINENCE** | | | |
| **Behavioural interventions** | | | |
| *Dietary modification* | | ± | |
| **Expert opinion:** Reducing caffeine or fibre in the diet might be a supportive measure for improving faecal incontinence symptoms where this is associated with loose or watery stools (72). | | | |
| *Habit retraining* | ± | ± | |
| **Level III-1 evidence:** There is insufficient quality of evidence to provide a firm basis of evidence in residential aged care settings (73). | | | |
| *Prompted voiding* | + | ± | |
| **Level III-2 evidence:** Limited evidence from a study suggests that prompted voiding when combined with other protocols, such as fluid prompting and mobility can decrease the frequency of faecal incontinence and increase appropriate faecal voiding in a toilet (74). | | | |
| *Timed toileting* | ± | ± | |
| **Expert opinion:** Developing an individualised toileting regime and toileting the patients/residents according to the regime are of paramount importance for the treatment of faecal incontinence. Refer to the American College of Gastroenterology's *Practice guidelines: diagnosis and management of faecal incontinence* (72). | | | |
| *Address constipation and faecal impaction* | ± | ± | |
| **Expert opinion:** There is consensus that constipation directly affects continence (57). Refer to Registered Nurses Association of Ontario nursing best practice guideline, *Prevention of constipation in the older adult population* <http://www.rnao.org.au>.<br>**Level III-1 evidence:** A randomised controlled trial demonstrated that treatment of constipated patients with faecal incontinence with laxative alone is unsatisfactory. Other contributing major risk factors such as mobility and cognitive impairment need to be considered (75). | | | |
| *Environmental and lifestyle modification* | | ± | |
| **Expert opinion:** Brisk physical activity after meals or on waking and vigorous exercise can enhance colonic motility (76-78). | | | |
| *Biofeedback* | + | + | |
| **Level I evidence:** A recent systematic review of 46 studies (with a total of 1,364 patients) demonstrated a reduction in symptoms of faecal incontinence by 49 per cent. Seventy-two per cent were cured or improved following biofeedback therapy (79). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Pelvic floor muscle training* | ± | ± | |

**Level III-2 evidence:** A comparative study with concurrent controls identified levator ani failure as the key factor in aetiology of the faecal incontinence. Pelvic floor muscle training appeared to be an effective treatment for adults with anal incontinence; however, methodological limitations existed (80).

| **Pharmacological interventions** | | | |
|---|---|---|---|
| *Antidiarrheal drugs* | | ± | |

**Level II evidence:** Use of antidiarrheal drugs in treating chronic diarrhoea results in statistically significant improvement in symptoms of faecal incontinence; however, adverse effects should be considered (81, 82).

**Expert opinion:** Non-specific antidiarrheal agents decrease intestinal motility and decrease stool frequency, hence reducing the faecal incontinence frequency. Modified stool consistency should also be considered because the formed stool is easier to control. Excessive use of the antidiarrheal, however, might precipitate constipation (83, 84).

| *Laxatives* | | ± | |
|---|---|---|---|

**Level III-2 evidence:** A multicentred study of 22 facilities found that bulk laxatives (Fybogel, Regulan) and suppositories are superior to lactulose and are associated with the lowest rates of faecal incontinence (85).

**Expert opinion:** Suppositories or enemas, though they might cause mild rectal discomfort, minimal bleeding and a burning sensation, tend to be commonly used and effective in treating selected people with incomplete rectal evacuation or those with post-defecation seepage (72, 83).

| *Topical phenylephrine* | | ± | |
|---|---|---|---|

**Expert opinion:** This is not currently approved for the treatment of faecal incontinence (83).

| *Tricyclic antidepressant therapy* | | + | |
|---|---|---|---|

**Level II evidence:** An open-labelled study showed that amitriptyline (20 mg) for four weeks for idiopathic faecal incontinence was statistically significant in decreasing the incontinence score (86).

| **Surgical interventions** | | | |
|---|---|---|---|
| *Sphincteroplasty* | | ± | |

**Expert opinion:** Sphincteroplasty is the appropriate first-line therapy for incontinence related to post-obstetric trauma; however, recent studies have shown this process is beneficial only in the short term (87).

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Dynamic graciloplasty* | | + | |

**Level I evidence:** A systematic review suggested that dynamic graciloplasty was clearly effective at restoring continence in between 42 per cent and 85 per cent of patients. It was associated with a higher rate of complication and had a significant risk of re-operation. There is a requirement for further evidence of patient benefits and cost effectiveness, as well as long term outcome, particularly for elderly institutionalised people (88).

| *Implant of an artificial bowel sphincter* | | ± | |
|---|---|---|---|

**Level III-1 evidence:** A prospective multicentred study demonstrated successful outcome results in 85 per cent of patients with a functioning device. Device related complication rates were very high and so was the rate of revisional replacement and retransplant (89).

| *Sacral nerve stimulation* | | + | |
|---|---|---|---|

**Level II evidence:** In one study that assessed the short-term effect, median incontinence frequency decreased (46). Larger, well designed controlled trials that include clinically important measures are required for conclusive recommendation (90).

| **Other interventions** | | | |
|---|---|---|---|
| *Absorbent products* | + | + | |

**Level I evidence:** A systematic review identified that disposable products might be more effective than non-disposable products in decreasing the incidence of skin problems and super-absorbent products might perform better than fluff pulp products; however, tentative conclusions can only be drawn due to poor quality studies (68).

| *Plugs, procon incontinence device, sphincter bulkers* | ± | | |
|---|---|---|---|

**Expert opinion:** Due to the lack of a proper controlled study or long term outcome study, there is no conclusive evidence to recommend use of devices such as anal plugs, procon incontinence devices or sphincter bulkers in treating faecal incontinence (84).

| *Electrical stimulation* | | ± | |
|---|---|---|---|

**Level I evidence:** A systematic review reported there were insufficient data to draw a reliable conclusion about the effect of electrical stimulation in treating faecal incontinence (91).

# Nutrition *5*

## Summary and recommendations

| NUTRITION |
|---|
| Malnutrition is a major cause of functional decline and increased morbidity and mortality in older people. |
| Malnutrition is common in the older person and can be broadly divided into inadequate macro nutrition (protein, energy malnutrition) and inadequate micro nutrition (vitamin deficiency). |
| Two important functions of adequate nutrition in the older person are the maintenance of muscle strength and of bone strength. |
| The prevalence of protein energy malnutrition ranges from 25–65 per cent of institutionalised older people without acute diseases. |
| Prevalence of malnutrition in hospitalised patients has been shown to be 36 per cent and has been associated with increased length of stay, increased infection rates and increased mortality. |

## RECOMMENDATIONS

Assess the nutritional status of older patients or residents, including vitamin D status

There is insufficient evidence for providing dietary advice alone in the management of illness related malnutrition.

Consider nutritional interventions for those who are malnourished or at risk of malnourishment. These include:

- increasing the nutrient density of food via supplementation of food, vitamins and drinks
- making snacks available between meal times
- offering fluids to people at regular intervals.

Ensure adequate intake of vitamin D.

- All people over the age of 65 years should have a daily vitamin D intake of at least 400 IU a day.
- Older people at higher risk of vitamin D insufficiency or deficiency (for example, those who are housebound or in residential care) should have a daily vitamin D intake of at least 800 IU a day. Patients/residents with documented vitamin D deficiency might require higher doses of vitamin D replacement. Consider specialist referral for guidance.
- Oral vitamin D supplementation for older people should be given in association with calcium supplementation of at least 800 mg a day for men and 1000 mg a day for women.

Promote non-dietary interventions, which encourage independent eating.

- Ensure appropriate set up of plate at meal time, with appropriate assistive devices.
- Optimise the patient's or resident's position at meal times (for example, sitting out of bed).

Assess and treat co-morbidities that contribute to malnutrition risk:

- depression
- nausea and vomiting
- dentition and oral hygiene problems.

## Links to nutrition specific guidelines

No current guidelines addressing aspects of nutrition were identified and assessed. The recommendations are made based on current availability of literature (systematic reviews and randomised controlled trials).

## Summary of the evidence

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| NUTRITION | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain micro nutrition** | **Maintain macro nutrition** | **Maintain hydration** |
| **Dietary interventions** | | | |
| *Increase the nutrient density of food.* | ± | | |
| **Expert opinion:** Increase the protein content by adding milk powder, egg whites or tofu. Increase the fat content by adding butter, margarine or oil and sauces and gravy. | | | |
| *Make snacks available between meal times.* | ± | ± | |
| **Expert opinion:** Make snacks available between meal times and offer snacks as part of a defined between meal snack program which might increase the likelihood of individuals eating between meals. | | | |
| *Consider giving daily multivitamin and mineral supplements.* | | ± | |
| **Expert opinion:** Consider giving daily multivitamin and mineral supplement to people whose food consumption is marginal. | | | |
| *Oral nutritional supplements* | + | + | |
| **Level I evidence:** A systematic review of 31 trials identified that supplementation with oral nutritional supplements appeared to produce a small but consistent weight gain. There was a statistically significant effect on mortality and reduced length of stay (92). | | | |
| *Dietary advice* | ± | ± | |
| **Level I evidence:** There is insufficient evidence for providing dietary advice alone in the management of illness related malnutrition. Oral nutritional supplements or supplements in combination with dietary advice, rather than advice alone, might be more effective in enhancing weight gain (93). | | | |
| **Vitamin D and Vitamin D analogues** | | | |
| *Supplementation of vitamin D3 and calcium* | + | | |
| **Level I evidence:** A systematic review demonstrated that vitamin D alone without calcium supplementation does not reduce incidence of hip fracture. Administering vitamin D3 with calcium co-supplementation to frail older people in sheltered accommodation does reduce hip fracture incidence (94). A meta analysis demonstrated that vitamin D reduced the risk of falls by 22 per cent (95). | | | |

| NUTRITION | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain micro nutrition | Maintain macro nutrition | Maintain hydration |
| *Supplementation of vitamin D3 and calcium* | ± | ± | |
| **Expert opinion:** All people over the age of 65 years should have a daily vitamin D intake of at least 400 IU a day. Those older people at higher risk of vitamin D insufficiency or deficiency (for example, those who are housebound or in residential care) should have a daily vitamin D intake of 800 IU a day. Oral vitamin D supplementation for older people should be given in association with calcium supplementation of at least 800 mg a day for men and 1000 mg a day for women (96, 97). | | | |
| **Non-dietary interventions** | | | |
| *Treat depression* | ± | ± | ± |
| **Expert opinion:** Appetite loss is a symptom of depression. By treating depression, appetite is stimulated. | | | |
| *Manage nausea* | ± | ± | ± |
| **Expert opinion:** The presence of nausea or vomiting might indicate medication side effects or a gastrointestinal, hepatobiliary or renal disorder. All medications should be reassessed for continued indications, potential side effects and interactions that might affect nutritional status. | | | |
| *Correct any dentition problems.* | ± | ± | ± |
| **Expert opinion:** The status of dentition should be considered in the assessment of older people in acute, sub-acute and residential aged care and corrected where possible. | | | |
| *Exercise* | + | + | |
| **Level II evidence**: Progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in long term care (47). | | | |
| *Promote independent eating* | ± | ± | ± |
| **Expert opinion:** Provision of assistive devices, such as plate guard, built-up cutlery and beaker with fitted lid, will enhance the patient's or resident's ability to remain independent in eating and drinking. | | | |
| *Positioning* | ± | ± | ± |
| **Expert opinion:** Sitting out of bed for meals will place the individual in a better position to reach meal items and to feed oneself successfully. | | | |
| **Maintaining oral hydration** | | | |
| *Regular presentation of fluids to older person* | | | + |
| **Level II evidence:** Regular presentation of fluids every one-and-a-half hours to bedridden residents of residential aged care facilities helps to maintain fluids (98). | | | |

# Skin Integrity *6*

## Summary and recommendations

| SKIN INTEGRITY |
| --- |
| Many terms are used to describe skin breakdown, including pressure ulcers, pressure areas, pressure sores, bedsores, ischaemic ulcers and decubitus ulcers. |
| Pressure areas occur when the soft tissue is compressed between bony prominences and an external surface for a long time. |
| The intensity and duration of pressure is related to factors that impede mobility, activity and sensory perception. |
| Australian pressure ulcer prevalence rates range from 13–37 per cent. Incidence rates range between 5.4 per cent and 11 per cent. |
| International pressure ulcer prevention strategies have been shown to reduce pressure ulcer incidence by up to 30 per cent. |
| Maintaining skin integrity is important because pressure areas are associated with pain, reduced mobility, increased risk of in-hospital complications, and increased health care costs associated with prolonged length of stay. |

## RECOMMENDATIONS

Perform a pressure ulcer risk assessment on patients/residents on admission

Perform a daily skin integrity assessment on older patients/residents at risk of pressure ulcers.

Optimise skin hygiene.
- Keep skin clean and free from all potentially irritating substances or those that affect skin pH.
- Use topical moisturiser.
- Avoid high skin temperature by avoiding skin contact with plastic surfaces.
- Prevent or minimise effects of incontinence.

Maintain adequate hydration and nutrition.

Maintain mobility.

Review mechanical loading and support surface measures. Ensure patients/residents do not remain in one position for longer than two hours. Avoid prolonged sitting in a chair or wheelchair.
- Consider use of high specification foam mattresses.
- Reduce heel pressure by using pillows or foam under the whole length of the lower leg. **Do not use air filled vinyl boots to reduce heel pressure.**
- Consider using pressure relieving overlays on operating tables and in the post-operative period.
- Consider using high technology and other devices in very high risk people or those who have failed with other conservative measures.

## Links to skin integrity specific guidelines

- Australian Wound Management Association 2003, *Clinical practice guidelines for the prediction and prevention of pressure ulcers,* AWMA, Perth. <http://www.awma.com.au>

- National Institute for Clinical Excellence 2003, *Pressure ulcer prevention: pressure ulcer risk assessment and prevention, including the use of pressure-relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care*, NICE, London. <http://www.nice.org.uk/pdf/PRD_Fullguideline.pdf>

- Rycroft-Malone, J & McInness, E 2000, *Pressure ulcer risk assessment and prevention. Technical report,* Royal College of Nursing, London.

## Summary of the evidence

**+** = demonstrated positive effect

**−** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| SKIN INTEGRITY | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Reduce excessive pressure | Maintain mobility | Maintain nutrition |
| General skin care measures | | | |
| *Daily skin inspection* | ± | | |
| **Expert opinion:** Individuals at risk of developing pressure ulcers should have a comprehensive skin inspection at least daily for signs of impaired skin integrity (99). | | | |
| *Skin hygiene* | ± | | |
| **Expert opinion:** The skin should be kept clean and free from all potentially irritating substances and those that substantially alters skin pH. Dry flaky skin should be treated with a topical moisturiser. Avoid high skin temperatures by avoiding skin contact with plastic surfaces covering mattresses and pillows and ensure turning schedules do not exceed two hours for people on basic mattresses (99). | | | |
| *Nutrition* | | | + |
| **Level II evidence:** Maintain adequate nutrition. Nutritional supplementation should be considered where nutritional deficits compromise skin integrity. A systematic review by Langer et al. (2004) identified one study (Bourdel 2000) which was sufficiently large and methodologically rigorous to demonstrate that nutritional supplements reduced the number of new pressure ulcers (100). Where appropriate, refer to a dietitian. | | | |
| *Mobilisation and activity* | | + | |
| **Level III-2 evidence:** A prospective cohort study of hospitalised patients older than 55 years of age demonstrated that immobilised patients had a greater risk of developing a pressure ulcer (101, 102). | | | |
| *Management of continence* | ± | | |
| **Expert opinion:** Avoid skin contact with urine or faeces and employ interventions to promote continence, such as continence training or continence aids (99). | | | |
| Mechanical loading and support surface measures | | | |
| *Positioning* | ± | | |
| **Expert opinion:** The most frequently recommended turning schedule is two hourly. Skin inspection with each turn is recommended to determine whether more frequent turning is required (99). | | | |

| SKIN INTEGRITY | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Reduce excessive pressure | Maintain mobility | Maintain nutrition |
| *Sitting* | ± | | |
| **Expert opinion:** Avoid prolonged uninterrupted sitting in a chair or wheelchair. Repositioning or shifting of pressure points should occur as frequently as every 15 minutes to hourly depending on the tissue tolerance to pressure (99). Even with appropriate pressure relief, it might be necessary to restrict sitting time to less than two hours in people at elevated risk of skin breakdown (103). | | | |

# Comprehensive guide

# Comprehensive Guidelines for Prevention of Functional Decline

## 1.1 Definition of functional decline

Functional decline is defined as a decrement in physical and/or cognitive functioning (1). The age related functional decline of physiologic systems means that older people experience a decrease in reserve capacity, which renders them more susceptible to deconditioning. The cumulative nature of the functional decline that occurs with ageing and the deconditioning imposed on an older person with bed rest or immobility can thrust those who are vulnerable into a state of irreversible functional decline.

There is evidence that the older person is at risk of functional decline during hospitalisation, and it is the leading complication of hospitalisation for older patients (1). This functional decline can manifest as the development of pressure areas, decreased mobility and associated weakness, the development of delirium, incontinence and malnutrition. There is also evidence that functional decline in older patients is associated with adverse outcomes, ranging from increased length of stay to higher levels of institutionalisation and increased mortality. Functional decline can occur as early as day two of hospitalisation (104). Patients highly value functional status and wellbeing and therefore they should be essential outcomes of medical care (105).

## 1.2 Scope and purpose

Clinical practice guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate healthcare for specific clinical circumstances (3). These guidelines were developed using the best available research findings and, where research gaps exist, consensus processes. The purpose of these guidelines is to provide recommendations about interventions and management strategies for preventing functional decline in older people in the acute, sub-acute and residential aged care settings.

The overall objectives of the guidelines are to:

- provide older people with healthcare that is person-centred and evidence-based
- ensure the best possible health outcomes for older people
- improve the function and quality of life of older people in acute, sub-acute and residential aged care.

It is acknowledged that risk screening and risk assessment are important and necessary steps in identifying people at risk of functional decline; however, the focus of these guidelines is on interventions and management strategies to prevent functional decline in older people in the acute, sub-acute and residential aged care settings (illustrated in Figure 1).

These guidelines provide general information about preventing functional decline. They should be used in conjunction with evidence based domain-specific evidence-based guidelines. Where available, links to domain specific guidelines are provided.

Many of the recommendations require small changes in staff practice, which in many cases can be implemented without substantial resource allocation.

## 1.3 Development process and guidelines components of care

The Clinical Reference Group of the Australian Health Ministers' Advisory Council's (AHMAC) Care of Older Australians Working Group (COAWG) oversaw the guideline development process. COAWG funded the project.

The Clinical Epidemiology and Health Service Evaluation Unit established a multidisciplinary advisory group comprising a consumer representative and health professionals from medical, nursing and allied health backgrounds with expertise in providing care to older people across the acute, sub-acute and residential care sectors. The multidisciplinary advisory group identified five domains associated with functional decline:

- cognition and emotional health
- mobility, vigour and self-care
- continence
- nutrition
- skin integrity.

The guidelines were developed around these five domains with a focus on interventions to prevent decline in each. Figure 2 provides the framework illustrating the relationship of the five domains to each other and to the outcomes associated with functional decline. Other key areas that influence the experience an older person has within the acute, sub-acute and residential aged care sectors are the consideration of their cultural beliefs and acknowledgement of their individual diversity. The areas of polypharmacy and surrounding environmental issues also influence the potential an individual has for developing functional decline and are addressed in the 'Important considerations' section.

The advisory group undertook a literature search for clinical practice guidelines and systematic reviews. It also conducted a search for randomised controlled trials subsequent to publication of identified clinical practice guidelines and systematic reviews. The group members identified further relevant studies.

The guideline recommendations for specific interventions were developed through a process of critically appraising the literature and adopting consensus statements from the multidisciplinary advisory group. The draft guidelines were reviewed and refined following a consultation process which included consumers, nursing, medical and allied health staff, and health care administrators (see list of key expert external consultants).

## 1.4 Who will use these guidelines?

These guidelines were developed for those who deliver and are responsible for patient/resident care. This includes clinical, management, corporate and environmental services staff.

## 1.5 Using these guidelines in the different settings

These guidelines are relevant to all areas of clinical practice, including acute care, sub-acute care and residential aged care. There are some differences across sectors in their organisational, environmental and staffing arrangements and the level of dependency and clinical need of patients/resident; however, the sectors can take a broadly similar approach to preventing functional decline and as such, these guidelines are structured for use as a global resource. There might be some circumstances where a preventive strategy is relevant to only one setting and in these instances, recommendations are described separately.

It is envisaged users will apply these clinical practice guidelines in conjunction with screening and guides to best practice assessment of older people and functional decline domain-specific clinical practice guidelines.

## 1.6 Interpretation of the evidence

These guidelines are based on research evidence and where no formal research evidence exists, on consensus statements. Where recent and well developed evidence-based guidelines exist, as evaluated using the Appraisal of Guidelines for Research and Evaluation (AGREE) tool (106), these guidelines' recommendations were adopted for use. In addition, systematic reviews and randomised controlled trials provided the evidence for guideline development. The research methodology is described in the research supplement.

All the potential benefits and harms identified in the review process are included in the summary of the evidence.

## 1.7 Levels of evidence

The Clinical Epidemiology and Health Service Evaluation Unit assessed and classified the evidence for the guideline recommendation for specific interventions according to the National Health and Medical Research Council's *Guide to the development, implementation and evaluation of clinical practice guidelines* (3). Levels of evidence of effectiveness describe the strength of the research evidence supporting each recommended specific intervention to prevent functional decline. Table 1 outlines the levels of evidence.

**Table 1: Levels of evidence used for guideline recommendations (107)**

| LEVEL OF EVIDENCE | 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 pre-test and post-test |

## 1.8 Procedure for updating guidelines

It is recommended these guidelines be updated within three to five years of completion, as proposed in the National Health and Medical Research Council's *Guide to the development, implementation and evaluation of clinical practice guidelines* (3).

## 1.9 Prevention of functional decline process model

These guidelines do not describe the management of pre-existing conditions. As outlined in the process model (below), these guidelines are aimed at strategies that prevent or minimise the risk of functional decline. The process model outlines the broad principles of risk assessment and risk management, which include identifying individuals 'at risk' and associated risk factors, implementing strategies aimed at reducing or eliminating risk factors and protecting the individual from potential further risk, and continually evaluating the effectiveness of the care delivered.

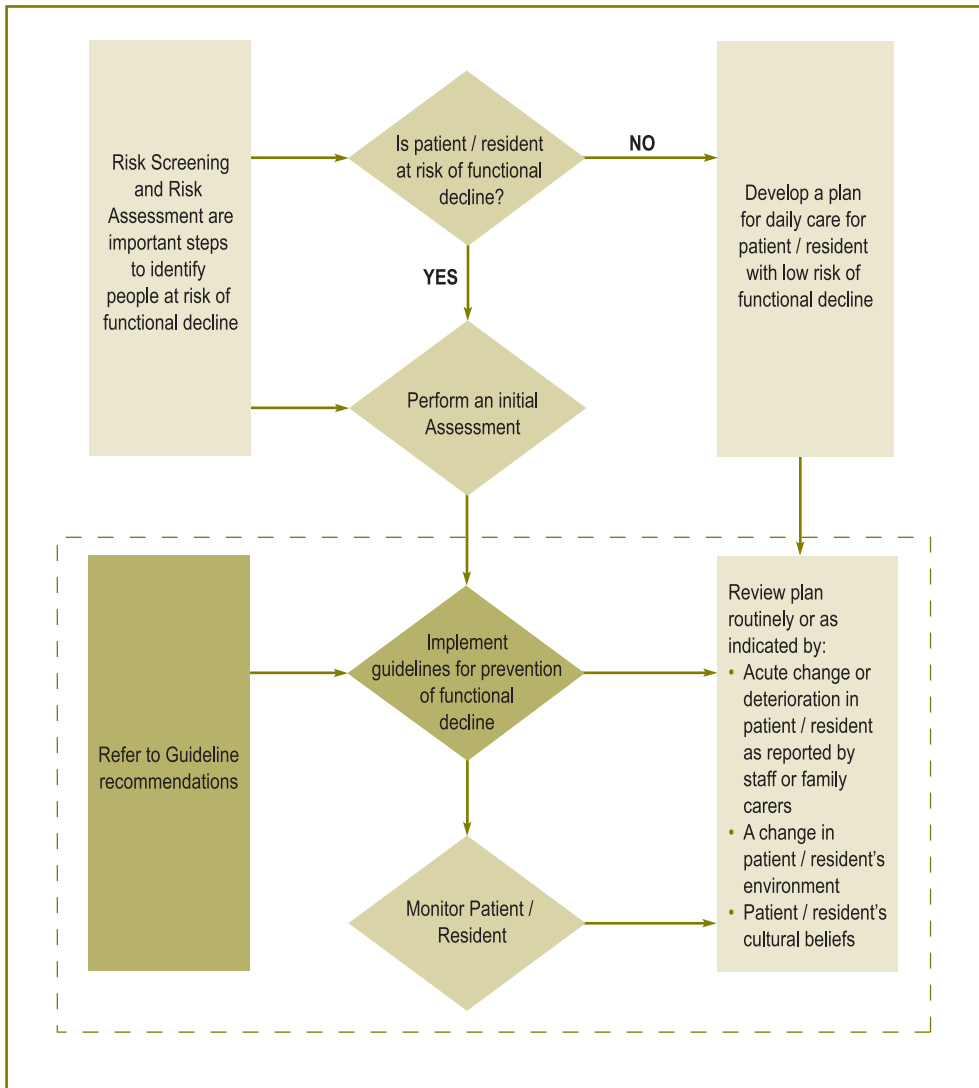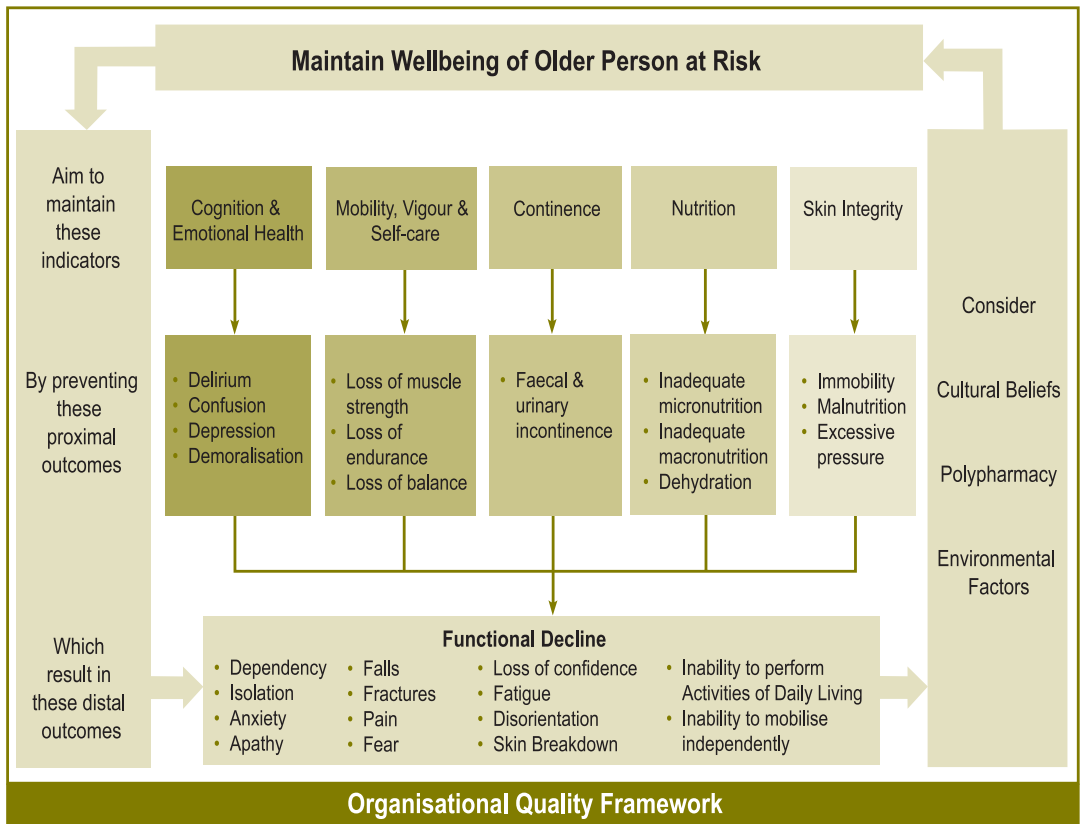**Figure 1: Process Model for Preventing Functional Decline in Older People**

## Figure 2: Prevention of functional decline framework



**Maintain Wellbeing of Older Person at Risk**

Aim to maintain these indicators

| Cognition & Emotional Health | Mobility, Vigour & Self-care | Continence | Nutrition | Skin Integrity |

Consider

By preventing these proximal outcomes

- Delirium
- Confusion
- Depression
- Demoralisation

- Loss of muscle strength
- Loss of endurance
- Loss of balance

- Faecal & urinary incontinence

- Inadequate micronutrition
- Inadequate macronutrition
- Dehydration

- Immobility
- Malnutrition
- Excessive pressure

Cultural Beliefs

Polypharmacy

Environmental Factors

Which result in these distal outcomes

**Functional Decline**

- Dependency
- Isolation
- Anxiety
- Apathy

- Falls
- Fractures
- Pain
- Fear

- Loss of confidence
- Fatigue
- Disorientation
- Skin Breakdown

- Inability to perform Activities of Daily Living
- Inability to mobilise independently

**Organisational Quality Framework**

## Important considerations

Other factors that influence an older person's ability to maintain function should be considered in conjunction with the recommendations outlined in these guidelines. These include cultural beliefs and individual diversity, polypharmacy and environmental factors—all of which influence the health and wellbeing of older people across all sectors of the health system and therefore need to be considered in management strategies.

## 1.10 Cultural beliefs and individual diversity

The significance of cultural beliefs to the older person's experience of illness and subsequent provision of health care services should be considered. Significant issues might include cultural expectations about the meaning of having an illness, gender roles within the family for the patient/resident and their carers, appropriate exercise and dietary regimes and the respective roles of the patient/resident and the physician in managing illness.

Programs for specific culturally and linguistically diverse groups might help address culturally specific differences in the ways clients and carers experience illness and adapt to and cope with it. Currently, there is insufficient literature available to describe and support such strategies; however, expert opinion recommends investigating these issues as they relate to an individual patient/resident and ensuring the care plan accommodates these issues.

Cultural issues are also important when considering using screening and assessment tools. Difficulty in translating the language and cultural appropriateness of tools leads to methodological problems in cross-cultural validation of these screening instruments. In addition, cultural issues can impact on a person's performance in an interview: cross-cultural comparative research has demonstrated the impact the circumstances of the interview have on results. The context can influence both the respondent's capacity and their willingness to respond (108) and valid measurement might be compromised across cultures by the presence of unfamiliar words or culturally inappropriate translations or questions (109).

Cultural differences also complicate decisions about management. Auger (1993) points out that multicultural older people might be invisible, with family and friends meeting consumer needs. Auger also asserts that services are usually not available in the language of the minority group nor based on cultural expectations and values. As a consequence, their needs might not be met. Auger states '…we ask 'them' what they need from 'our' system of health care delivery rather than facilitating their own expression of their needs' (110).

Henry et al. (2004) write that 'any health care system is a social institution built on the cultural stance of the population it serves'. It would follow that cultural values should provide the value base for health services (111). Within Australia, the diversity of cultural groups, including Aboriginal and Torres Strait Islander groups, can and does create issues around which health services are organised and healthcare is provided. Recognition and respect of individual diversity and cultural and religious beliefs can facilitate the experience of the older person from a culturally and linguistically diverse background.

## 1.11 Polypharmacy

Polypharmacy is most often defined as the concomitant ingestion of four or more medications. Polypharmacy can be 'appropriate' (when treatment is suitable), 'inappropriate' (when a patient takes more drugs than medically necessary) or 'redundant pseudo-polypharmacy' (when clients are recorded as taking more drugs than they actually do) (112). Pharmacologic management is highlighted as one of the most important areas for improvement in quality of care for older adults (113). Almost half of all iatrogenic complications during hospitalisation are the result of adverse drug reactions (113). Delirium and falls are two well established complications of medications in hospitalised older patients and both are associated with increased morbidity and mortality (114). Studies suggest that advancing age alone does not explain the risk for adverse drug reactions among older inpatients and that polypharmacy is the most consistent and powerful predictor of adverse drug reactions (115).

Potential indicators of polypharmacy include the identification of new problems, such as unsteadiness or dizziness, soon after commencing new medications, symptoms that might be side effects of medications (for example, dizziness, low blood pressure on standing upright) and falls at night. As well as the number of medications, there are specific types of medications that are associated with complications, particularly falls.

### Psychotropic medications

Psychotropic medications are commonly used for anxiety problems and behavioural problems, such as aggression and sleep disturbances (116). Medications under the broad classifications of benzodiazepines, major tranquilisers and antidepressants are psychotropic. An Australian study identified that 17 per cent of people aged over 65 years based in the community were taking one or more benzodiazepine (117). This figure increases to 49 per cent in older people in residential care facilities (118).

As psychotropic medications are addictive, gradual systematic weaning is indicated, even in short-acting benzodiazepines (119). There are guidelines outlining recommended strategies for weaning psychotropic medications (120). The introduction of non-pharmacological alternatives, such as relaxation, support and reassurance, avoidance of daytime naps and heavy meals before sleep, and increasing amounts of exercise, might assist with the weaning process (121).

### Other medications

Diuretics, type 1a anti-arrhythmics and digoxin have also been shown to have a significant association with increasing falls (122).

### Management of polypharmacy

The National Prescribing Service provides guidelines on drug use in older people, including:

1. Keep an up-to-date list of all medicines your patient is using: prescription, over-the-counter and complementary.

2. Formal medication review can help to avoid medicine related problems in older people.

3. Non-drug measures should always be first-line for managing sleep problems.

4. Using anti-psychotics to control difficult behaviour is of questionable efficacy, and is definitely associated with adverse effects (123).

These guidelines can be found at www.nps.org.au.

## Medication review

Admission to the acute or residential aged care sector is an opportune time to review a patient's or resident's list of medications and the indications for them. Reference to the medication history (including consultation with the general practitioner about drug choice) might be indicated. The medical staff should be informed if there are any side effects of medications, such as drowsiness or unsteadiness. Non-pharmacological alternatives to psychotropic medications can be trailed to reduce the risk of falls (51).

Residential aged care settings can facilitate medication reviews via the Medication Review Program. One study reported that a pharmacist-initiated medication review in a long stay rehabilitation/residential care facility resulted in up to an 18 per cent reduction in use of medications associated with high falls risk, such as sedatives and hypnotics, and a 47 per cent reduction in the number of falls following the introduction of the program (124).

### Referral

Where polypharmacy occurs, refer the client for review by a doctor or pharmacist to assess and recommend ongoing medication needs. If necessary, refer client to occupational therapy or psychology to provide alternatives to high risk medication, such as sedatives (51).

### Modification of the environment

When using medications, such as sedatives that affect alertness and increase drowsiness, implement strategies that minimise risk of falls at night, such as increased surveillance or positioning a commode by the bed (51).

## 1.12 Environmental factors

Environmental factors can contribute to the functional decline of the older person across all sectors of the health system. Environmental risk factors can be individual, relating to the immediate environment of the patient/resident, or generalised. General environmental risk factors are found in those areas a person frequents throughout the day. For example, in the acute setting, lack of access to assistive devices, clutter in the hospital room, an unfamiliar environment, inadequate lighting or changes in lighting, high beds, bed rails, intravenous lines, indwelling catheters, physical and chemical restraints, all contribute to immobilisation of the hospitalised patient (14). This immobilisation can contribute to loss of muscle strength and balance, and therefore facilitate functional decline (refer to the mobility, vigour and self-care section). The Victorian Quality Council (2004 (24)) describes the actions required to minimise individual environmental risk factors concerning falls prevention.

# Cognition

# Cognition and Emotional Health          *2*

## Links to cognition specific guidelines

Current guidelines addressing aspects of delirium and depression include:

- Registered Nurses Association of Ontario 2003, *Screening for delirium, dementia and depression in older adults,* RNAO, Ontario. <www.rnao.org/bestpractices >

- Registered Nurses Association of Ontario 2004, *Caregiving strategies for older adults with delirium, dementia and depression.* RNAO, Ontario. <www.rnao.org/bestpractices>

## Summary and recommendations

| COGNITION AND EMOTIONAL HEALTH |
|---|
| Subjective wellbeing is defined as positive evaluation of one's life associated with positive feelings. |
| Cognitive impairment can result from a number of conditions, including dementia, delirium and depression. |
| Delirium is an acute organic disturbance of higher cerebral function associated with impaired ability to attend to the environment. <br> • The prevalence of delirium in older people on admission to hospital ranges between 10 per cent and 24 per cent and new cases arise in 6–56 per cent of older patients during hospitalisation. <br> • Overall, it appears prevention of delirium is more efficacious than early detection and treatment. |
| Dementia is a general term used to describe a form of cognitive impairment that is chronic, generally progressive and occurring over a period of months to years. <br> • Forty-five per cent of people with moderate to severe dementia are living in residential aged care facilities. <br> • The disability burden from dementia in Australia was found to be the second highest of any disease. |
| Depression is a multifaceted syndrome, comprising a constellation of affective, cognitive, somatic and physiological manifestations in varying degrees from mild to severe. <br> • The incidence in long-term care settings is three to four times higher than in the general population. |

| RECOMMENDATIONS |
| --- |
| Assess cognitive status (delirium, dementia and depression) including premorbid status |
| Consider the need for specialist geriatric or psychiatry assessment. |
| Perform proactive assessment for delirium risk. |
| Provide optimal pain management. |
| Implement measures to prevent cognitive functional decline:<br>• Undertake early medical evaluation.<br>• Encourage physical activity.<br>• Undertake medication review.<br>• Optimise environmental stimulation and familiarity with surroundings.<br>• Consider behavioural and psychosocial interventions. |
| Consider disease-specific pharmacological interventions for dementia and depression. |
| Consider transitional care needs and community-based strategies for people discharged from hospital and residential care. |
| Include and consider patient/resident's carer or family. |

## Cognition and Emotional Health: Evidence summary

**+** = demonstrated positive effect

**−** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain optimal cognitive function** | **Prevent demoralisation** | **Maintain emotional health** |
| **Delirium** | | | |
| *Multicomponent strategy* | + | | |
| **Level II evidence:** Standardised protocols for the management of six established risk factors for delirium (cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment and dehydration) significantly reduced the number and duration of episodes of delirium in hospitalised older patients (4, 5). Methodological constraints apply, with poor methodology and heterogeneity. | | | |
| *Proactive geriatric consultation* | + | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial which indicated that a proactive geriatrics consultation, including reference to adequate oxygen delivery, fluid/electrolyte balance, treatment of severe pain, elimination of unnecessary medications, regulation of bowel and bladder function, adequate nutritional intake, early mobilisation and rehabilitation, prevention, detection and treatment of major post-operative complications, appropriate environmental stimuli and treatment of agitated delirium, reduced the risk of delirium development (particularly severe delirium) after hip fracture (5, 6). | | | |
| **Physiological interventions** | | | |
| *Nurse-led interdisciplinary intervention program* | + | | |
| **Level II evidence:** Education of nursing staff, systematic cognitive screening, consultative services by a delirium resource nurse, a geriatric nurse specialist or psycho-geriatrician and use of a scheduled pain protocol resulted in a shorter duration and lower severity of delirium in the intervention cohort (5, 7). | | | |
| *Sleep–wake cycle* | ± | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial which indicated that delirium could be prevented by improving the post-operative sleep–wake cycle by using a combination of benzodiazepines and an opioid. The intervention was not associated with severe complications or side effects, but morning lethargy was observed in 40 per cent of patients (5, 8). However, expert opinion suggests other options should first be considered and the use of medication to manage the sleep–wake cycle should be a last resort due to the effect of opioids and benzodiazepines on older patients/residents. | | | |

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| INTERVENTIONS | Maintain optimal cognitive function | Prevent demoralisation | Maintain emotional health |
| *Pain management* | + | | |
| **Level I evidence:** A systematic review identified one randomised controlled trial where patient controlled analgesia virtually eliminated the occurrence of delirium in the frail elderly surgical patient (9). | | | |
| **Pharmacological interventions** | | | |
| *Reduce or eliminate non-essential medication* | ± | | ± |
| **Expert opinion:** The reduction or elimination of non-essential medication can reduce episodes of delirium. Special attention should be given to those medications known to contribute to delirium. Evaluation and monitoring of pharmacological measures should occur, including rationalisation (10). | | | |
| **Environmental interventions** | | | |
| *Optimise environmental stimulation* | ± | ± | ± |
| **Expert opinion:** Optimisation of environmental factors, including stimulation, sensory impairments, familiarisation and orientation, allow delirium to be managed (10). | | | |
| **Educational interventions** | | | |
| *Tailor disease-specific information* | ± | ± | ± |
| **Expert opinion:** Assessing individual educational needs of the client and the care giver enhances the understanding of the condition (10). | | | |
| **Communication and emotional support** | | | |
| *Maintain a supportive therapeutic relationship* | ± | ± | ± |
| **Expert opinion:** Consideration of the client's and carer's needs enhances the management of delirium (10). | | | |
| DEMENTIA | | | |
| **Psycho-social interventions** | | | |
| *Consider the patient* | ± | ± | ± |
| **Expert opinion**: Relations between the carer and client are facilitated when their abilities are recognised and the environment in which they are surrounded is understood (10). Counselling the patient/resident and family can assist with symptom management and acceptance (11). | | | |

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Maintain optimal cognitive function | Prevent demoralisation | Maintain emotional health |
| **Pharmacological management** | | | |
| *Oestrogen replacement therapy* | – | | |
| Level II evidence: A randomised controlled trial of 4,532 post-menopausal and dementia-free women identified that those taking a combined oestrogen and progesterone tablet had an increased risk of probable dementia (12). | | | |
| *Non-steroidal anti-inflammatory drugs (NSAIDs)* | ± | | |
| Level III-2 evidence: A meta analysis of six cohort and three case-control studies found that non-steroidal anti-inflammatory drugs gave some protection against the development of Alzheimer's disease (13). | | | |
| *Aspirin* | ± | | |
| **Expert opinion:** A Cochrane Review was unable to identify that aspirin has an effect on vascular dementia, despite its wide use in practice (14). | | | |
| *Statins* | ± | | |
| **Expert opinion:** Lipid lowering statins may prevent the development of dementia via indirect effects of stroke prevention (15). | | | |
| *Antihypertensives* | + | | |
| Level II evidence: Two randomised controlled trials have found that long term use of antihypertensives reduces the risk of dementia and cognitive decline (16, 17). | | | |
| *Anticholinesterase* | + | | |
| Level I evidence: Two meta analyses identified that cholinesterase inhibitors have a positive effect on delaying and minimising the decline in dementia (18, 19). These drugs work most effectively in mild to moderate Alzheimer's disease. | | | |
| *Neuroleptics* | ± | | ± |
| **Expert opinion:** The method of treatment is often chosen with the side effects in mind (20). | | | |
| **Natural alternative treatment** | | | |
| *Antioxidant vitamins* | + | | + |
| Level II evidence: A randomised controlled trial suggests cognitive function in older people taking oral supplementation of vitamin E is improved compared with placebo (21). It has been proposed that high dietary intake of vitamin E is associated with lowering the risk of Alzheimer's disease (15, 20). | | | |

| COGNITION AND EMOTIONAL HEALTH | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain optimal cognitive function | Prevent demoralisation | Maintain emotional health |
| *Ginkgo biloba* | ± | | ± |
| **Expert opinion:** A Cochrane Review identified there is promising evidence of improvement in cognition and function, however, results are inconsistent. There is need for a large trial using modern and more robust methodology (22). | | | |
| **Non-pharmacological interventions** | | | |
| *Non-pharmacological interventions* | ± | | ± |
| **Expert opinion:** Interventions that focus on the stimulus of the behavioural symptoms are beneficial. | | | |
| *Reality orientation classes* | + | | |
| **Level I evidence**: Reality orientation classes (ten sessions in three weeks) have a positive effect on community-dwelling elderly with dementia. This might be able to be extrapolated into sub-acute and residential care settings (23). | | | |
| **DEPRESSION** | | | |
| *Target known risk factors* | + | | + |
| **Level I evidence**: A systematic review identified risk factors among community-dwelling adults such as bereavement, sleep disturbance, disability, prior depression and the female gender. Screening individuals to identify those at risk might provide the opportunity to reduce the risk of depression (24). | | | |
| *General management principles* | ± | | ± |
| **Expert opinion:** The general management principles include monitoring for self-harm, educating the patient and carer, treating the whole person, treating the depressive symptoms and prompt referral (25). | | | |
| *Relapse prevention program* | + | | |
| **Level I evidence:** A relapse prevention program targeted at primary care patients with a high risk of relapse/recurrence who had largely recovered after antidepressant treatment significantly improved antidepressant adherence and depressive symptom outcomes (26). | | | |
| *Depression care managers* | + | | |
| **Level I evidence:** A combination of a clinical algorithm for treating geriatric depression and treatment management by depression care managers was effective in reducing suicidal ideation and depressive symptoms in patients with major depression and, when suicidal ideation was present, minor depression (27). | | | |
| *Exercise* | + | | + |
| **Level I evidence:** Two randomised controlled trials demonstrated that exercise can affect depressive symptoms of older adults in a positive way in the community setting (28, 29). A systematic review identified that mood in elderly people who participate in exercise or physical activity is significantly improved compared with those who do not (30). Another systematic review identified that physical activity might enhance total sleep duration, sleep onset latency and global sleep quality, therefore enhancing quality of life in the aged (31). | | | |

# Cognition and emotional health

Subjective wellbeing is defined as positive evaluation of one's life associated with positive feeling (125). Social integration, good health, competence and a high self-esteem are important predictors of wellbeing in old age (125). Illness and disability, including cognitive impairment (125), as well as social isolation and forms of elder abuse, might contribute to a low sense of wellbeing.

Cognitive impairment can result from a number of conditions, including dementia, delirium and depression. Decline in cognitive functioning can have a significant impact on a person's health and wellbeing. Documentation of pre-admission cognitive function, early identification of risk factors for delirium and dementia, and appropriate referral for specialist geriatric assessment are the main preventive strategies for maintaining cognition and emotional health.

## 2.1 Aim

To optimise cognition and emotional health of older patients/residents by implementing evidence-based management and prevention strategies for delirium, dementia and depression.

## 2.2 Delirium

Delirium is an acute organic disturbance of higher cerebral function associated with impaired ability to attend to the environment. Delirium often occurs in people who have medical illnesses. The onset of delirium is usually rapid and the cognitive disturbance fluctuates over the day. Characteristic features of delirium include disorientation, poor short term memory and altered level of consciousness. Other common features include disturbance of the sleep–wake cycle and development of hallucinations, delusions and psychomotor disturbances. Psychomotor impairment might take the form of hyperactivity, which is often associated with behavioural disturbances and hallucinations or hypoactivity where patients are lethargic (5, 126-128). Less than half the patients present with disruptive behaviour, while those older patients presenting as 'hypoalert' are often considered the ideal patient: quiet and motionless (129). Historically, delirium has also been referred to as acute confusional state, acute brain syndrome and toxic psychosis (5).

Some of the causes of delirium (10) are listed below.

- Infections
- Medications
- Substance withdrawal (for example alcohol, sedatives and others)
- Acute metabolic disturbances and hypoxia
- Central nervous system disorders
- Endocrine disorders
- Trauma
- Toxins and heavy metal poisoning

There is usually evidence from the patient's history, physical examination or investigations that the delirium is a direct physiological consequence of an acute medical condition, substance intoxication or withdrawal, use of a medication, toxin exposure, or a combination of these factors (127).

Older patients are less likely to recover fully and can experience persistent cognitive deficits (5, 127). Although delirium is associated with increased morbidity and mortality, it is often unrecognised and subsequently under treated by physicians (5, 128, 130).

Inouye (1999) has developed a model for estimating the risk of developing delirium during hospitalisation (4). The model is based on predisposing factors and acute additional stressors (5). Predisposing factors are believed to have multiplicative effects; for example, a patient with few pre-hospitalisation risk factors can develop deliriumif subjected to severe stress during a hospital stay. Conversely, a patient with many risk factors prior to admission is likely to become delirious even when subjected to mild stress during hospitalisation (5).

Elie et al. (1998) performed a meta analysis regarding risk factors for delirium in elderly medical, surgical and psychiatric patients and identified the four most common risk factors for the development of delirium as dementia, medical illness, alcohol abuse and depression (5, 131).

Inouye's model allows for early identification of elderly patients in acute care at high risk for delirium and for the targeting of preventive strategies. This consists of aggressive management of known risk factors and early detection of delirium (5). Identification of a potential delirium might assist in the early detection of a medical illness. It is important to complete a comprehensive assessment of each patient, including functional and cognitive status, as a baseline including evidence of pre-existing dementia (10).

## 2.2.1 Extent of the problem

Older people are particularly vulnerable to delirium because of changes in brain function, multiple general medical problems, polypharmacy, reduced hepatic metabolism of medications, multisensory decline, and brain disorders, such as dementia. Residents of aged care facilities are at particular risk of delirium (127).

The prevalence of delirium in the older person varies with clinical setting. Rates are lowest among community-dwelling older people (0.4–1.1 per cent) (130). In contrast, the prevalence of delirium in older people on admission to hospital ranges between 10 per cent and 24 per cent and new cases arise in 6–56 per cent of older patients during hospitalisation (126, 132). Among the cognitively impaired, 45 per cent have been found to develop delirium and these patients have longer lengths of hospital stay and a higher rate of complications, which contribute to increase costs of care (128). In surgical patients, delirium is associated with higher risk for post-operative complications, longer post-operative recuperation periods and long-term disability.

Despite this, only 32–66 per cent of patients are properly diagnosed and treated. Delirium, which goes undetected or treated, can substantially increase the risk of poor outcomes. Elderly patients who develop delirium during a hospitalisation have an increased chance of dying during that hospitalisation (5).

## 2.2.2 How can delirium be prevented or minimised?

Weber et al. (2004) conducted a systematic review of optimal prevention strategies and treatment for delirium. The review concluded that while there were substantial methodological flaws in some of the studies, there is evidence supporting a number of strategies to prevent delirium, including aggressive management of established risk factors for delirium and special nursing care. Overall it appears prevention of delirium is more efficacious than early detection and treatment (5).

### Consider multi-component strategies

Multiple factors can contribute to the development of delirium, therefore a multifaceted approach targeted at the management of identified risk factors is indicated (128, 132). The Registered Nurses Association of Ontario has developed  *Guideline for caregiving strategies for older adults with delirium, dementia and depression.* The guidelines is based on a systematic literature review and expert consultation (10). The guideline details multi-component care strategies to prevent delirium and focuses on addressing environmental factors, sensory impairment, continence, immobility, pain and unstable medical conditions.

A framework for the delivery of care strategies for delirium includes multi-component delirium prevention programs. Some studies suggest they are most effective when implemented with high risk populations or groups of patients/residents with a high risk of delirium, such as those who have had surgery (hip fracture) and who have medically complex conditions (128). The Registered Nurses Association of Ontario recommends that appropriate strategies should be selected based on the patient's risk factors and implemented simultaneously to prevent delirium (10). The process of assessing and implementing interventions needs to be dynamic and respond to the changing needs of the older person (128).

Delirium management units are specific multi-component units, which have been developed in some acute hospitals. Standardised protocols are established for the management of delirium risk factors: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment and dehydration. In a study by Inouye et al. (1999) that employed six risk factor protocols, significant improvement was found in the degree of cognitive impairment among patients with cognitive impairment at admission and a significant reduction in the rate of sleep medications among all patients. Trends towards improvement were found in immobility, visual and hearing impairment (4).

### Consider consultation or referral

A randomised controlled trial by Marcantonio et al. (2001 (31)) of 126 hospitalised patients to determine whether geriatric consultations could reduce delirium in hip fracture patients found a statistically significant reduction in delirium in the consultation group compared with the usual care group (133). Prompt consultation by specialised services is helpful in preventing, detecting and initiating early treatment. Examples of specialised services include specialised geriatric services, psychiatric services, neurologists, and members of the multidisciplinary team (10).

### Consider physiological stability/reversible causes

Medical evaluation that includes particular attention to a patient's level of oxygenation, possible occult infection (for example, urinary tract infection) and the possible role of medications is an *essential* initial approach to preventing and managing delirium in the elderly (127).Providing general supportive care,

including comfort measures, early mobilisation, meeting basic needs (for example, toileting, feeding, hydration, pain management), clear communication, reassurance and patient/family education, and minimal invasive interventions are all components of 'good nursing care' and promote patient wellbeing and assist to prevent delirium (134).

One randomised controlled trial was identified in a systematic review which indicated that delirium could be prevented by improving the post-operative sleep–wake cycle through use of a combination of benzodiazepines and an opioid (5, 8). However, as discussed in the polypharmacy section, medication in the older person, particularly opioids and benzodiazepines, can facilitate the onset of delirium. Patient controlled analgesia for post-operative pain management, as identified in a randomised controlled trial through a systematic review, has been shown to eliminate the occurrence of delirium in frail older people (9). Further research is warranted in both these areas and individual assessment is indicated in determining management strategies.

## Consider pharmacological risk

Older people are more likely than younger people to develop cognitive impairment as a result of taking medications. This reflects their reduced capacity for homeostatic regulation in response to acute illness, changes in drug handling with age and age- and disease-associated changes in brain neurochemistry (126).

In studies of older hospital patients, drugs have been reported as the cause of delirium in 11–30 per cent of cases. Medication toxicity occurs in 2–12 per cent of patients presenting with suspected dementia. In some cases central nervous system toxicity occurs in a dose-dependent manner, often as a result of interference with neurotransmitter function. Drug-induced delirium can also occur as an idiosyncratic complication. Finally, delirium might occur secondary to iatrogenic complications of drug use (126).

Almost any drug can cause delirium, especially in a vulnerable patient. Medications that have been associated with a *high risk* of delirium are listed below:

- Anticholinergic agents such as atropine and scopolamine
- Benzodiazepines such as nitrazepam, diazepam and oxazepam
- Opioid analgesic agents such as pethidine
- Antiparkinsonian agents such as trihexyphenidyl and benzatropine
- Antidepressant agents such as amitryptiline and imipramine
- $H_2$ Antagonist cimetidine

Many others have been reported to be associated with some increased risk for delirium (126, 135) The risk of drug-induced confusion increases with the number of drugs prescribed. Polypharmacy also leads to a greater potential for drug interactions and for mistakes in taking drugs. Drug-induced confusion can be prevented by avoiding polypharmacy and adhering to the 'start low and go slow' principal when prescribing medications for the older person.

Special care is needed when prescribing for people with cognitive impairment. Early diagnosis of drug-induced confusion and withdrawal of the offending agent or agents is essential (126). Reference to polypharmacy is made earlier in this report.

### Consider environmental interventions

Environmental interventions are designed to reduce or eliminate environmental factors that exacerbate delirium. They include providing an optimal level of environmental stimulation, reducing sensory impairments, making environments more familiar, providing environmental cues that facilitate orientation, and providing consistent staff and avoiding ward moves. Cognitive–emotional supportive measures include providing patients with reorientation (clocks and calendars), reassurance, and information concerning delirium that might reduce fear or demoralisation (127, 136). Simulating the sleep–wake cycle by increasing and reducing light, and a structured, predicted routine can also assist in managing delirium (10).

### Consider education

Assessment of the older person's psychological, social and learning/educational characteristics will enable disease-specific information to be tailored for the patient/resident and their family. These resources should be shared among other treating clinicians (10).

### Consider communication and emotional support

The establishment and maintenance of a supportive therapeutic relationship with the patient/resident and family will assist with partner management. Support and orientation as well as confirmation of their emotional state and reality will also assist (10).

### Consider behavioural interventions

Behavioural interventions include simulation of wake–sleep cycles, close observation of the patient/resident, consistent staffing or primary nursing, provision of a structured and predictable routine, and avoidance of the use of restraints. These are all methods for minimising and managing delirium (10).

## 2.3 Dementia

Dementia is a general term used to describe a form of cognitive impairment, which is chronic, generally progressive and occurring over a period of months to years. The primary deficit in the more common forms of dementia is impaired short-term memory. The illness progresses to impairment of the use of language and other cognitive abilities, impaired ability to perform activities of daily living, and eventually death. Cognitive disturbances are common to both delirium and dementia; however, patients with dementia are usually alert and have no disturbance to arousal or level of consciousness (127).

Although many definitions of dementia exist, most include impairment of cognition, social and occupational functioning and performance in activities of daily living. There are more than 70 diseases that cause dementia, although Alzheimer's disease, vascular dementia, dementia with Lewy bodies, and combinations of these account for between 80 per cent and 90 per cent of cases (137). Fronto-temporal dementia usually occurs in a slightly younger age group and might account for about 10 per cent of cases (138). Different types of dementia have different treatment strategies.

**Alzheimer's disease** accounts for about 60 per cent of people with dementia (139). Usually developing after the age of 65 years, Alzheimer's disease is an insidious and progressive disease causing a gradual decline of mental abilities, including memory, judgment, abstract thinking and other intellectual functions. Personality changes might appear as the first symptoms in the early stages, with behavioural and cognitive changes developing as the disease progresses. In later stages, people with Alzheimer's disease can

become totally mute: inattentive, unresponsive and dependent on families and carers. As there is no apparent single cause, it is better regarded as a syndrome for which a number of possible risk factors have been proposed. These include genetic factors, ethnicity, education and intelligence levels, lifestyle and environmental factors (137). Cardiovascular risk factors have also been associated with an increased risk of Alzheimer's disease (140, 141).

**Vascular dementia,** formerly referred to as multi-infarct dementia, accounts for 10–20 per cent of those with dementia. Vascular dementia is caused by infarction or 'stroke' (sudden loss of blood supply to regions of the brain), cardiovascular disease, cerebro-vascular diseases and haemorrhage. Unlike Alzheimer's disease, it usually progresses in a fluctuating stepwise manner after an abrupt onset triggered by specific cerebral damage. In the case of small vessel dementia (one of several subtypes), however, the disease can be insidious and progressive. It is commonly accompanied by other neurological disorders, such as weakness in limbs, exaggerated deep reflexes, abnormality in eating patterns, hypertension, partial one-sided paralysis, sensory defects (for example, visual deficits), loss of voluntary motor control, depression and mood changes (137). There is significant overlap between risk factors and pathology of Alzheimer's disease and vascular dementia, with a number of cases regarded as 'mixed' Alzheimer's disease–vascular dementia.

**Dementia with Lewy bodies** accounts for almost 10 per cent of dementia diagnoses. It is a form of dementia associated with the growth in the brain of intracellular bodies (Lewy bodies), which are not completely understood. Clinical features include rapid onset and progression of socially and occupationally debilitating cognitive decline over a one - to four-year period. It is marked by fluctuating cognition, visual and auditory hallucinations and motor features in common with those of Parkinson's disease (142). Other features include frequent falling, syncope (sudden loss of blood pressure leading to swoons or unconsciousness), sensitivity to neuroleptic drugs, delusions and memory impairment (137).

**Fronto-temporal dementia** also accounts for about 10 per cent of dementia diagnoses. Memory is often intact until late in the illness and the core diagnostic features of fronto-temporal dementia are decline in social interpersonal conduct, impairment in regulation of personal conduct, emotional blunting and loss of insight. Language impairment is another common feature, which can be a presenting problem in some varieties of this disorder (138).

## 2.3.1 Extent of the problem

Although younger people can have dementia, it more commonly occurs in later life with the prevalence doubling every five years between age 60 and 85 years. More than 20 per cent of people over 80 years of age have some form of the disease. Due to the increasing population in older age groups, the number of people with dementia in Australia is expected to triple between 1999 and 2041 (143). There were 148,000 dementia cases in 1999 and this is expected to increase to 258,000 in 2021 and 450,000 in 2041 (143).

Although few studies on incidence rates in Australia have been carried out, one study found that for mild dementia in the 75–79 year age group, 43 people per 1,000 are diagnosed with dementia each year compared with 170 people per 1,000 in the 90 years and over age bracket (144). Findings from the mid-term review of the National Action Plan for Dementia Care indicate 45 per cent of people with moderate to severe dementia are living in residential aged care facilities and three-quarters of those living in the community live with others (137).

Twenty-eight per cent of low level residential aged care residents and 60 per cent of high level residential aged care residents have a diagnosis of dementia. The prevalence of cognitive impairment is much higher, at 54 per cent in low level residential aged care and 90 per cent in high level residential aged care(145).

Access Economics (2003) estimated the real cost of dementia to be $5.6 billion in 2002, which included $3.2 billion in direct health sector costs (mainly residential care), around $1.7 billion in family and carer costs, and the remainder in productivity losses, home and community care, modifications and aids (11, 146). The disability burden from dementia in Australia was found to be the second highest of any disease, and set to overtake depression by 2016 (146).

## 2.3.2 How can early identification of dementia contribute to patient outcomes?

The accurate and early diagnosis of the cause of cognitive impairment and dementia has many benefits. There are a number of potentially treatable conditions, including depression and delirium that can resemble dementia or coexist with dementia. It is important these conditions are identified and treated to either reverse the cognitive impairment or improve the prognosis and progression of dementia.

Although there is no cure, there are ways to reduce risk factors, to treat and manage the behavioural and psychological signs and symptoms of dementia, and to improve quality of life for the individual and family carer. While no large scale, randomised, primary prevention trials have been completed, except in the case of hormone replacement therapy, there is growing epidemiological data suggesting a possible role for non-steroidal anti-inflammatory drugs, statins and antioxidants (15).

### Delirium and dementia

Delirium is superimposed on dementia when an acute change in mental status (characterised by a fluctuating course, inattention and disorganised thinking or altered level of consciousness) occurs in a patient with pre-existing dementia. Delirium has been found in previous studies to be associated with subsequent development of dementia and, conversely, dementia is associated with an increased risk of developing delirium. It is not clear whether delirium simply unmasks a previous unrecognised dementia or if it leads to cognitive decline and thereby increases the risk of developing dementia (126, 133).

Studies reviewed demonstrate the high prevalence (22–89 per cent) of delirium superimposed on dementia in community and hospital populations. The studies stress the importance of early recognition and prevention of delirium in people with dementia.

In people with delirium and dementia, the recommended intervention is a non-pharmacological multi-component approach maximising family support and orienting communication, minimising medication use, ensuring adequate hydration, and attending to sensory needs, such as vision and hearing impairment. Controlled studies on the influence of environment in delirium have been conflicting in the past, but a recent prospective study found that hospital unit, number of room changes, absence of a clock or watch, absence of reading glasses, absence of a family member, and presence of medical and physical restraints were significantly related to an increase in delirium severity scores. (133)

## Consider psycho-social interventions

### The patient

The Registered Nurses Association of Ontario (2004) suggests that caregiving strategies which incorporate getting to know the patient/resident, recognising the patient's or resident's abilities, and understanding the impact the environment has on them will facilitate the relations between carer and client (10).

Appropriate counseling through all stages of dementia progression is very helpful for the individual and the family. Psycho-education can help the person and their family learn to manage certain symptoms (such as cognitive behaviour therapy to address misbeliefs (delusions)) and can help prevent secondary morbidity, such as depression or anxiety (11).

Although people from culturally and linguistically diverse backgrounds might have been fluent in English, studies show that a person with dementia loses their most recent language first. Sometimes the person uses a mix of their native and second languages for a time. Translation might be of little help, but it can bring joy to a person to hear their native language spoken or played on tapes. It is estimated that 25 per cent of Australia's population aged over 60 years is post-war migrants and 25 per cent of them have a non-English speaking background. Twelve per cent of people in residential care are from culturally and linguistically diverse backgrounds, with a variety of cultural customs, traditions and values (11).

## Consider pharmacological management

### Oestrogen replacement therapy

Previous epidemiological data suggest estrogen replacement might prevent dementia, however data from the Women's Health Initiative suggest otherwise (12, 15). A randomised controlled trial of 4,532 post-menopausal, dementia-free women from the Women's Health Initiative Memory Study identified that those taking a combined estrogen and progesterone tablet had an increased risk of dementia (12). This increased risk would result in an additional 23 cases of dementia per 10,000 women each year. The Women's Health Initiative concluded that the risk of estrogen plus progesterone outweighed the benefits and therefore it is not recommended for prevention of dementia (12).

### Non-steroidal anti-inflammatory drugs

Aspirin and blood thinning (anti-platelet) agents reduce the risk of blood clots and potentially a stroke as well as having anti-inflammatory properties. A Cochrane Review identified that aspirin was widely prescribed for patients with a diagnosis of vascular dementia, however was unable to review any identified studies because they did not meet the inclusion criteria. Although non-steroidal anti-inflammatory drugs form the mainstay of treatment to slow the progression of vascular dementia, there is no empirical evidence to support this practice (14). One side effect of aspirin is increased risk of bleeding, particularly for high-risk people; for example, those with duodenal or stomach ulcers.

A meta analysis of six cohort (13,211 participants) and three case control (1,443 participants) studies found that non-steroidal anti-inflammatory drugs gave some protection against Alzheimer's disease (13). A randomised controlled trial of non-steroidal anti-inflammatory drugs for primary prevention (Alzheimer's Disease Anti-inflammatory Prevention Trial ) has been subsequently initiated to clarify the preventive action

of anti-inflammatory drugs. Results might not be available for some years (http://www.2stopAD.org) (15). People at high risk of developing Alzheimer's disease (strong family histories) have been given a preventive dose of ibuprofen (200 mg a day) (15).

### Statins

Lipid lowering HMG CoA reductase inhibitors (statins) might prevent the development of dementia via a direct effect of cholesterol on the degradation of the proteins in the brain and an indirect effect by reducing the risk of stroke and therefore cerebral infarcts (15, 141).

### Antihypertensive therapy

Hypertension is associated with an increased risk of both vascular dementia and Alzheimer's disease, however, randomised controlled trials have yielded conflicting data about the effect of antihypertensive therapy on dementia prevention (16, 17). The Systolic Hypertension in Europe (Syst–Eur) Study randomised patients into an active treatment group. The study identified that compared with controls, long term antihypertensive therapy (3.9 years) reduced the risk of dementia by 55 per cent (16). The Perindopril Protection Against Recurrent Stroke Study (PROGRESS) identified that the active treatment group had reduced risks of dementia and cognitive decline associated with recurrent stroke, indicating that all people with cerebrovascular disease should use antihypertensives (17).

### Cholinesterase inhibitors

Cholinesterase inhibitors (anti-dementia) drugs work best in the mild to moderate stages of Alzheimer's disease, rather than as a preventive agent. They provide symptomatic relief and are not disease-modifying agents. Evidence is also growing that they might be effective in vascular dementia and dementia with Lowey bodies, and that use in later stages might also be beneficial. Numerous trials indicate that consistent prolonged use of the various anti-dementia drugs give people a symptomatic benefit for nine to 12 months on average and possibly longer. There might be some improvement in clarity of thought, activities of daily living functionality, mood and behaviour. The current drugs do not halt the progression of dementia, although studies are looking at the effectiveness of combination treatments to this end (147). Specific rules exist for obtaining these drugs through the Pharmaceutical Benefits Scheme subsidy. People must have a diagnosis of probable mild to moderate Alzheimer's disease, confirmed by a specialist, and a baseline cognitive measurement. For a person to continue these drugs, a review to demonstrate symptomatic improvement over the first six months is required (11).

Trinh et al. (2003) performed a meta analysis on the effect of cholinesterase inhibitors on dementia and found that the positive effect would be similar to preventing a two-month decline per patient per year (18). A second meta analysis concluded that 12 patients would need to be treated for one to achieve minimal improvement or better (19).

### Neuroleptics

Neuroleptics can be used to treat delusions and hallucinations in people with dementia. Pharmacotherapy is not necessary if the delusions or hallucinations do not disturb the patient or their family, or until the symptoms become problematic. The type of side effects experienced generally influences drug choice. Atypical neuroleptics are highly potent and have a lower incidence of extrapyramidal effects, while typical neuroleptic medications are less potent but highly sedative (20).

### Consider natural alternative treatment

*Antioxidant vitamins*

Several observational studies have evaluated the use of antioxidants in preventing dementia, with varying results. It has been proposed that high dietary intake of vitamin E is associated with lowering the risk of Alzheimer's disease (15); however, methodological constraints exist with these studies, as demonstrated in a Cochrane Review (148). A randomised controlled trial of 86 subjects demonstrated improved cognitive function in older people after they took an oral supplement of trace elements and vitamin E for one year (21).

*Ginkgo biloba*

Ginkgo biloba, derived from the leaves of a Chinese tree, has come under scrutiny for its anti-inflammatory, anti-oxidant and anti-platelet properties. A systematic review of 33 trials of ginkgo for cognitive impairment and dementia concluded that ginkgo is safe and shows some promise (22). The review identified that the studies were not particularly robust and a large trial using modern methodologies should be conducted to determine the efficacy and to provide some regulating factors on recommended dosage and content (22).

*Consider non-pharmacological management*

Non-pharmacological interventions should focus on the stimulus of the behavioural symptoms. Physical, occupational and speech–language therapies can assist with specific problems: for example, an occupational therapist can help maximise independence while identifying necessary modifications in the home or in driving. Diversional, reminiscence, validation, music, movement/dance and craft therapies might be useful to calm, comfort and occupy people with dementia, particularly when these activities involve family and carers. Swimming and hydrotherapy can also bring peace and quality of life. Massage, aromatherapy, light therapy, laughter, companionship and warm touch (from children or pets as well as other adults) might also be beneficial (10, 11, 149).

Reality orientation classes (ten sessions in three weeks) have a positive effect on community-dwelling elderly people with dementia, as identified in a Cochrane Review. It might be possible to modify these classes to suit the sub-acute and residential aged care settings (23).

## 2.4 Depression

Depression is a multifaceted syndrome comprising a constellation of affective, cognitive, somatic and physiological manifestations in varying degrees from mild to severe (128). The assessment and management of depression in the elderly involves major challenges. Frequent co-morbidity with various medical conditions and the use of polypharmacy contribute to both over-detection and under-detection of mood disorders in the elderly. Reluctance or inability to voice mental health concerns or to use mental health services are also significant issues among older people. Systematic biased assumptions persist among health care providers who often view depression as normal in the context of medical or mental impairment, resulting in a missed diagnosis and treatment opportunity (150).

Demoralisation is a condition which is well recognised in palliative care environments and needs to be distinguished from depression. It is associated with chronic illness, disability, bodily disfigurement, fear of loss of dignity, social isolation, subjective sense of incompetence and often progresses to a desire to die or to commit suicide (151). Demoralisation can influence an older person's ability to participate in health care and their subjective wellbeing or self-concept.

Gold standard criteria for major depression are included in the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) classification; however, the DSM-IV (see table 3,) might not reflect the full spectrum of depressive disorders. The organic symptoms (3, 5 and 6) might not be sufficiently discerning between aged populations and another depression scale might be appropriate. One example is the Geriatric Depression Scale.

The prognosis for people suffering major depression is poor. Depression is associated with poorer functioning, comparable to or worse than that of people with chronic medical conditions, such as heart and lung disease, arthritis, hypertension and diabetes. In addition to poor function, depression increases the perception of poor health, the use of medical services and health care costs (24). Depression can also lead to increased mortality from other diseases, such as heart disease, myocardial infarction and cancer. Untreated depression can also result in increased substance abuse, slowed recovery from medical illness or surgery, malnutrition and social isolation (128).

### Table 3: Criteria for major depressive episode (DSM-IV) *(152), (127)*

| Five or more of the following symptoms have been present during the same two-week period and represent a change from previous functioning. At least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure. | |
|---|---|
| 1 | Depressed mood most of the day, nearly every day |
| 2 | Markedly diminished interest or pleasure in all or nearly all activities most of the day, nearly every day |
| 3 | Significant weight loss when not dieting or weight gain (for example, change in more than 5 per cent of body weight in one month), or decrease or increase in appetite nearly every day |
| 4 | Insomnia or hypersomnia nearly every day |
| 5 | Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down) |
| 6 | Fatigue or loss of energy nearly every day |
| 7 | Feelings of worthlessness or excessive or inappropriate guilt nearly every day |
| 8 | Diminished ability to think or concentrate, or indecisiveness, nearly every day |
| 9 | Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide |

## 2.4.1 Extent of the problem

Major depression occurs in 1–3 per cent of the general elderly population and an additional 8–16 per cent has clinically significant depressive symptoms. The incidence in long term care settings is three to four times higher than in the general population (128, 150). Groups at particular risk of depression include inpatients, residents of long term care and patients with dementia, especially those with vascular dementia (150). Sleep disturbances can result in cognitive impairment and depression, with prevalence rates of insomnia in the over 65 years age group reaching 12–30 per cent (31).

Late-life depression frequently remains improperly diagnosed and inadequately treated (153). There are high rates of relapse and recurrence for most patients with major depression and few primary care patients receive continuation and maintenance therapy following the treatment for an acute episode (26). Depression is the strongest risk factor for late-life suicide and for suicide's precursor, suicidal ideation. Suicide rates are highest for the late–life population (27).

## 2.4.2 How can major depression be prevented or minimised?

The Registered Nurses Association of Ontario's *Guideline for caregiving strategies for older adults with delirium, dementia and depression* identifies that primary prevention for depression focuses on strategies directed at public education, the dissemination of information about depression, and the risks associated with depression, such as suicide. Secondary prevention activities include screening and early identification of depressed older adults and suicide risk as well as crisis intervention and psychotherapy. Tertiary prevention activities are linked with rehabilitation and the continuing care of those older adults living with depression and are to assist family, friends and community-dwelling partners (128).

These strategies tend to be targeted at community-dwelling older people, however some components might be able to be extrapolated to the acute, sub-acute and residential sectors. Ideally, screening for depression should be targeted at high risk populations, such as those suffering chronic debilitating illness, recent major physical illness, bereavement, social isolation, complaints of persistent loneliness or sleep difficulties (153).

### Consider targeting known risk factors

A systematic review by Cole et al. (2003) explored the risk factors for depression among elderly community-dwelling subjects (24).The review's purpose was to determine risk factors for depression among elderly community subjects. The combined results of 20 prospective studies indicate that five factors—bereavement, sleep disturbance, disability, prior depression, and female gender—are associated with the development of depression in an older person. Bereavement, sleep disturbance and disability are potentially modifiable (24). Screening individuals to identify those at high risk of depression (for example, bereaved women with prior depression, disability and sleep disturbance) provides an opportunity to target interventions to reduce the risk of depression. Such interventions might include education about the significance of the risk factors, bereavement counselling and support, new skills training, 'maintenance of routines' protocols, enhancement of social supports, individual or group therapy to facilitate adjustment to loss of function, and sleep enhancement protocols (24). The results of the meta-analysis must be interpreted cautiously due to the methodological limitations of the study.

## Consider general management principles

Most depression is treated in the primary care setting (25). The management should be holistic, multidisciplinary, comprehensive and individualised and include a combination of biological (drugs and electroconvulsive therapy), psychological (supportive, cognitive behavioural therapy and grief work) and social (family intervention, support services, and activity program) strategies (153). Baldwin et al. (2003) summarise the general management principles for late-life depression as:

- monitoring risk of self-harm

- educating the patient (and care givers) about depression and involving them in treatment decisions

  - treating the whole person (co-existing physical disorder, attention to sensory deficits and other handicaps, sign posting the patient to appropriate social care agencies, reviewing medication with a view to withdrawing unnecessary ones)

  - treating depressive symptoms with the aim of complete remission (as residual symptoms are a risk factor for chronic depression)

  - promptly referring patients requiring specialist mental health services (25).

## Consider transitional care needs and post-discharge community-based strategies

### Relapse prevention program

Katon et al. (2001) conducted a randomised controlled trial to compare the impact of a relapse prevention program with usual care. Patients in the intervention group received two primary care visits from a depression specialist and three telephone visits over a one-year period with the aim of enhancing adherence to antidepressant medication, recognising prodromal symptoms, monitoring symptoms, and developing a written relapse prevention plan (26). The study found that the intervention group had greater adherence to adequate dosage of antidepressant medication and fewer depressive symptoms, but not fewer episodes of relapse or recurrence over the 12 month follow-up period (26).

### Depression care managers

Bruce et al. (2004) conducted a randomised controlled trial known as PROSPECT (Prevention of Suicide in Primary Care Elderly Collaborative Trial) (27). PROSPECT's intervention combined treatment guidelines for the older person with management by depression care managers. Use of a clinical algorithm for treating geriatric depression enhanced physician knowledge. The algorithm recommended a first-line treatment of a selective serotonin reuptake inhibitor. If a patient declined medication therapy, the physician could recommend interpersonal psychotherapy from the depression care manager.

The guidelines covered continuation and maintenance phase treatment over the course of one year. The depression care managers were practice-based and collaborated with physicians, assisting to recognise depression, offering guideline-based treatment recommendations, monitoring clinical status and providing appropriate follow-up.

Rates of suicidal ideation declined faster in the intervention group compared with the usual care patients and intervention patients had a more favourable course of depression in both degree and speed of symptom reduction. The effects on depression were not significant among patients with minor depression unless suicidal ideation was present.

## Consider an appropriately tailored exercise program

The most frequently used treatment for depression is antidepressive medication; however, as many as 30–35 per cent of patients do not respond to treatment and unwanted side effects can also occur (29). Exercise has been shown to have psychological benefits, including improvements in cognitive function, mood and sense of wellbeing, in studies addressing older, healthy, non-depressed adults (29, 30). Blumenthal et al. (1999) conducted a randomised controlled trial on 156 people (aged 55 to 70 years) and found that 16 weeks of exercise was equally as effective at reducing the depressive symptoms as antidepressant therapy (29). However, medication was able to initiate a more rapid therapeutic response than exercise (29).

Singh et al. (2001) conducted a randomised controlled trial involving 32 subjects (with a mean age of 71 years) performing a 20-week strengthening exercise program. The study identified that unsupervised strength training was safe and feasible, maintaining an antidepressive effect over the long term in outpatient depressed elderly people (28). The benefits of treatment were more pronounced in those with more severe depression and persisted despite the withdrawal of personal supervision and group training (28). These studies have been performed in the community setting and their results might not be able to be generalised to other settings. The results, however, suggest exercise can assist with controlling depressive symptoms and should therefore be considered across all sectors of the health care system.

A systematic review has also shown that physical activity can enhance total sleep duration, sleep onset latency and global sleep quality, therefore contributing to enhanced quality of life (31).

# Mobility

# Mobility, vigour and self-care *3*

## Links to falls specific guidelines

• American Geriatrics Society, British Geriatrics Society & American Academy of Orthopaedic Surgeons 2001, 'Guideline for the prevention of falls in older persons', *Journal of the American Geriatrics Society*, vol. 49, no. 5, pp. 664–72.

• Queensland Health 2003, *Falls prevention: best practice guidelines for public hospitals and state government residential aged care facilities incorporating a community integration supplement,* Queensland Health, Brisbane.
<http://www.health.qld.gov.au/fallsprevention/best_practice/falls_best_practice.pdf> [Currently being updated.]

• Victorian Quality Council 2004, *Minimising the risk of falls and fall-related injuries: guidelines for the acute, sub-acute and residential care settings,* Department of Human Services, Melbourne.
<http://www.health.vic.gov.au/qualitycouncil>

## Summary and recommendations

<table>
<tr><td style="background-color:#7a7a1e;color:white"><strong>MOBILITY, VIGOUR AND SELF-CARE</strong></td></tr>
<tr><td>

The ability to walk, climb stairs, transfer in and out of bed, shower, dress and toilet is related to an older person's level of strength, balance and endurance.

- The rate of loss in strength might be as high as 5 per cent a day with bed rest and is greater in the lower limbs than in the upper limbs.

- Effective balance is important to reduce the likelihood of falling in situations when balance is threatened.

- Reduced aerobic capacity can occur with prolonged periods of bed rest.

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Age related functional decline of physiologic systems means that older people are more susceptible to deconditioning; however, deconditioning is manageable with regular exercise.

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Reduced mobility and falls can result from poor balance, reduced muscle strength and lack of endurance.

- In the acute hospital setting, fall rates of between two and seven falls per 1,000 bed days have been reported.

- In sub-acute care, up to 46 per cent of patients from high risk clinical groups (such as those who have suffered stroke) fall, while fall rates in residential care settings are often considerably higher, in the range of 30–50 per cent.

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**Falls can also have psychological and social consequences. Recurrent falls are a common reason for admission to residential aged care.**

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</table>

| RECOMMENDATIONS |
|---|
| Perform a comprehensive assessment for falls and fracture risk, mobility and functional status |
| Develop an individualised care plan, encourage appropriate incidental activity throughout the day and minimise bed rest. |
| Assess and modify the environment to encourage independence and mobility. |
| Consider referral to a physiotherapist or occupational therapist for:<br>• individual or group exercise training for muscle strength, endurance and balance<br>• retraining of activities of daily living. |
| Maintain nutritional supplementation in combination with strengthening exercises to improve strength. |
| Provide supervision of walking and transfers in those identified to be at risk of falling. |
| Consider transitional care needs and community-based strategies for minimising post-discharge falls and maintaining ongoing strength, mobility and vigour. |

## Mobility, Vigour and Self-Care: Evidence Summary

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| MOBILITY, VIGOUR AND SELF-CARE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain muscle strength** | **Maintain endurance** | **Maintain balance** |
| **Exercise interventions** | | | |
| *Incidental activity* | ± | | |
| **Expert opinion:** Increasing the number and amount of incidental activities during the day can help maintain muscle mass, strength and mobility and reduce agitation in older people in residential care (32). | | | |
| *Progressive resistance training (strength)* | + | | |
| **Level 1 evidence:** A systematic review identified that progressive resistance training appears to be an effective intervention to increase strength in older people and has a positive effect on some functional outcomes (33). | | | |
| *Endurance training* | | + | |
| **Level I evidence:** A meta analysis identified that endurance training significantly increases functional capacity in the older community-dwelling person and that the increase is related to subject age, duration of exercise bouts, length of training regimen and pre-training maximum oxygen consumption (34). Further investigation is warranted regarding frequency, duration and intensity of training (34). | | | |
| *Balance training* | | | + |
| **Level II evidence:** To improve balance performance, exercise needs to have a balance component, not just strength training (35). Exercises need to be specific to the level of function, which is to be achieved. Balance exercises lead to improvements in static balance function, while gait exercises result in improved dynamic balance and gait functions (36). Sitting balance exercises are insufficient to effect dynamic balance (37). | | | |
| *Tai chi* | | | + |
| **Level I evidence:** Two systematic reviews identified evidence supporting the use of tai chi to improve balance and postural control (38, 39). Practicing tai chi for a period of 15 weeks has a positive effect on fear of falling and reduces risk of falling (38). A recent randomised controlled trial used tai chi in 311 frail, older residents of residential aged care settings and while it found that falls were not reduced, it identified a positive trend indicating further research is required in this area (40). | | | |
| Physiotherapy and occupational therapy | + | + | + |
| **Level II evidence:** Two randomised controlled trials identified that individualised programs, which often include strength, balance and functional retraining, have been shown to increase mobility and reduce the use of assistive devices in residential care settings (41, 42). | | | |

| MOBILITY, VIGOUR AND SELF-CARE | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Maintain muscle strength | Maintain endurance | Maintain balance |
| *Walking aid* | | | + |
| Level II evidence: Walking aids have been shown to reduce falls in those with intermediate levels of activity (43). | | | |
| *Group exercises* | + | + | + |
| Level II evidence: Two randomised controlled trials have demonstrated that group exercises that incorporate balance, strengthening, aerobic and functional activities have achieved improved mobility and function in older people in sub-acute hospital and residential care settings (44, 45). | | | |
| *Exercise program via allied health assistant* | + | | |
| Level II evidence: A randomised controlled trial of 180 older general medical patients (aged 65 years or older) demonstrated improved functional outcomes and reduced length of stay for patients who participated in an exercise program while an inpatient (46). | | | |
| **Nutrition** | | | |
| *Nutritional supplementation* | + | | |
| Level II evidence: Progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in long term care (47). | | | |
| **Falls-specific interventions** | | | |
| *Multidisciplinary, multifactorial, health/ environmental risk factor screening and intervention* | + | + | + |
| **Level I evidence:** A systematic review of 21 studies identifying effects designed to reduce falls in older people across the community, hospital and residential settings identified complex interventions as likely to be beneficial (48). These complex interventions varied in their details of the assessment, referral and treatment protocols; however, in most studies a nurse or other trained health professional made an initial assessment and the patients/ residents were provided with advice and referral to appropriate health providers (48). A systematic review of ten studies (three randomised controlled trials and seven prospective studies) involving risk assessment, an education or awareness program, equipment checks, labels or bracelets for high risk patients, and use of alarms, restraints or a tailored nursing care plan, demonstrated that particular interventions within a prevention program were equally effective at reducing falls in hospital (49). Poor sample size and study quality limited the power calculations (49). **Level II evidence** suggests that multifactorial interventions in residential settings should include staff education programs, gait training and advice on the appropriate use of assistive devices, and review and modification of medications, especially psychotropic medications (50). The evidence is insufficient to extrapolate findings to the acute sector (50). A randomised controlled trial demonstrated a reduction in falls in an intervention group, which included a multitargeted intervention, including a falls risk alert card, exercise, education and hip protectors (45). | | | |
| *Supervision* | | | ± |
| **Expert opinion:** Always supervise the person when they are walking or making transfers if they require assistance, are acutely unwell (51) or have increased falls. | | | |

# Mobility, Vigour And Self-Care

The ability to walk, climb stairs, transfer in and out of bed, shower, dress and toilet is associated with an older person's level of strength, balance and endurance. Maintenance of strength, balance and endurance is essential to prevent a loss of independence and functional decline. Frequent activity can influence an older person's ability to maintain mobility, vigour and self-care.

## 3.1 Aim

To assist health care providers to encourage and maintain mobility, vigour and self-care of the older person in the acute, sub-acute and residential aged care sectors

## 3.2 Muscle strength, balance and endurance

The age related functional decline of physiologic systems means older people experience a decrease in reserve capacity, which renders them more susceptible to deconditioning. Deconditioning has been defined as 'physiologic changes following a period of inactivity or low activity that result in functional losses' (1). The effects of bed rest or immobility appear earlier, are more severe and take longer to reverse in older people compared with younger people. The additive nature of functional decline that occurs with ageing and deconditioning associated with bed rest or immobility can thrust vulnerable older people into a state of irreversible functional decline. Deconditioning can occur in community-dwelling older people and an older person can reduce this decline by maintaining levels of activity. Pre-morbid assessment of activity is essential to determine baseline level of function on entry to the health care system.

### 3.2.1 Strength

Muscle mass and strength are reduced with age, which might reflect the progressive loss of reserve capacity associated with reduced physical activity with age(154). The loss of muscle strength that occurs with inactivity is well documented, and often it is this level of inactivity that pushes an older person into a state of weakness rather than the associated ageing changes. The rate of loss in strength might be as high as 5 per cent a day and is greater in the lower limbs than in the upper limbs (155, 156). In addition, muscle shortening, joint contractures and reduced muscle oxidative capacity occur with immobilisation (157).

### 3.2.2 Balance

Effective balance is important to reduce the likelihood of falling in situations when balance is threatened. Balance is a complex process and there are many factors that can cause poor balance. Effective balance requires efficient and accurate sensory (visual vestibular and somatosensory) input, central integration, and execution of appropriate motor responses to maintain stability during activity (51). Health problems affecting any of these systems will increase a person's risk of falling (158-160).

Intrinsic (personal) risk factors for falling include age related declines in systems involved in effective balance performance (for example, reduced vision, sensation, balance and strength associated with ageing), as well as health problems affecting these systems (for example, cataract or glaucoma, peripheral neuropathy and arthritis) (161-164). Extrinsic (environmental) risk factors are environmental hazards,

which increase the risk of falling and include slippery or uneven surfaces, poor lighting and poor placement of recently used objects. Some of these risk factors are modifiable with appropriate intervention or treatment. Impaired balance and unsteadiness during walking, transferring and turning are also common consequences of diagnoses such as stroke (165), Parkinson's disease (166) and dementia (167).

### 3.2.3 Endurance

Cardiovascular deconditioning can occur with prolonged periods of bed rest and in conjunction with the changes that occur in muscle metabolism, can lead to reduced aerobic capacity (157). The mechanics of respiration are also altered with ageing. Costo-chondral calcification and reduction in muscle strength diminishes ribcage expansion. Functional residual capacity is decreased and closing volume increases. This combination of effects on pulmonary ventilation results in the reduced arterial oxygen tension ($PO_2$) commonly seen in older people (154).

The supine position reduces pulmonary ventilation even further, causing changes in both lung volumes and the mechanics of breathing. These changes frequently result in atelectasis, further oxygen desaturation and predisposition to pneumonia (157). Mean arterial oxygen tension has been shown to drop from 85 mmHg to 77 mmHg in healthy older people when assuming the supine position (168). This reduction in $PO_2$ can also be sufficient to produce symptoms of confusion in an older patient/resident already at the threshold of pulmonary insufficiency (154).

### 3.3 Extent of the problem

Reduced independence, mobility and falls can result from poor balance, reduced muscle strength and lack of endurance. Falls are a major public health problem (169) and are the highest ranked cause of hospital admissions for unintentional injury in Victoria (43 per cent), with similar trends nationally (170).

In the acute hospital setting, fall rates of between two and seven falls per 1,000 bed days have been reported (171). In sub-acute care, falls are more common, with up to 46 per cent of patients from some high risk clinical groups (such as stroke patients) falling at least once a day (171). The impact of falls can vary from no injury to death. Approximately 30–40 per cent of hospital falls result in injuries (51, 172). Fall rates in residential settings are often considerably higher than those in community settings, with fall rates in the range of 30–50 per cent (173-175). Half of all older people hospitalised for hip fractures cannot return home or live independently with their injury (176). The direct and indirect health care costs attributable to falls are therefore high.

Falls can also have psychological and social consequences, with fear of falling and post-fall anxiety syndrome developing. Loss of confidence in ambulating safely can result in self-imposed functional limitations which can further exacerbate risk for falling (177-179). Recurrent falls are a common reason for admission to long-term institutions (180).

Reduction in strength, balance and endurance can result in not only falls, but in reduced capacity to self-care and maintain independence. There is synergy between all factors that interplay to maintain independence. Mobility is important in an older person to maintain self-caring activities and when mobility is reduced, the ability to self-care is also affected.

## 3.4 How can the development of mobility problems be prevented or minimised?

Much of the literature relates to studies that were performed with older community populations rather than with people in long term residential care settings; however, some information can be generalised across settings. All risk factors and potential causes of reduced strength, balance and endurance identified through the comprehensive risk assessment process should be addressed. The aim of the risk assessment process is to inform the implementation of preventive strategies.

### Consider exercise interventions

Exercise has been shown to result in a range of health benefits for older people, including those who are frail, cognitively impaired and in residential aged care (47). Exercise programs can be delivered individually or in group settings, and also in the form of incidental activity to achieve desired outcomes.

#### Incidental activity

Increasing the number of incidental activities during the day can help maintain muscle mass, strength and mobility and reduce agitation in older people in residential care (32). Incidental activities include walking the patient to the toilet rather than using the commode and encouraging independence with functional tasks. This form of exercise is possibly the easiest intervention to perform in the acute setting.

#### Progressive resistant strength training

Progressive resistant strength training exercises are designed to increase strength in the older person by performing movements against a specific external force which is regularly increased during training (33). Strength training improves muscle mass, strength and muscle quality (181). Progressive resistant strength training has also been shown to preserve bone density in postmenopausal women (182) and can have a positive effect on some functional outcomes, particularly walking speed (33), as well as improving mood and reducing depression (28).

#### Endurance training

Endurance training significantly increases functional capacity in the community-dwelling older adults and is related to age, duration of exercise bouts, length of training regime and pre-training maximum oxygen capacity (34). Optimal frequency, intensity and duration have not been determined. Endurance training might not be practicable or practical in the acute sector where patients are acutely unwell or hospitalised for a short duration.

#### Balance training

Balance can be improved by performing specific balance exercises. Incorporating balance and functional training results in reduced trends of falling in the residential sector (44). McMurdo et al. (2000) demonstrated that seated balance activities are insufficient to improve standing balance and dynamic balance during gait (37); however, this result could have been influenced by a high drop-out rate (32.3 per cent) in this randomised controlled trial (37). Another randomised controlled trial found that balance exercises led to improvements in static balance function, while gait exercises resulted in improved dynamic balance and gait functions in the very frail older person (36)—therefore, appropriate selection of balance activities is necessary.

Tai chi is an increasingly popular method for achieving balance and postural control in community settings (38, 39), with positive effects being found on fear of falling (38). There are different types of tai chi, which have different physical demands on the participants and therefore potentially different outcomes. An abbreviated set of the 24-form Beijing style has been shown to reduce falls in community-dwelling older people (183). A recent randomised controlled trial used tai chi in 311 frail, older residents of residential settings. While the trial found that falls were not reduced, it identified a positive trend indicating further research is required in this area (40).

### Physiotherapy and occupational therapy

Individualised programs, which often include strength, balance and functional retraining, have been shown to increase mobility and reduce the use of assistive devices in residential care settings (41, 42). Cost savings have also been shown in residential care settings (42). Physiotherapists might also prescribe walking aids, which have been shown to reduce falls in those with intermediate levels of activity (43).

### Group exercises

Group exercises, which incorporate balance, strengthening, aerobic and functional activities, have achieved mobility and function improvements in older people in the sub-acute hospital and residential care settings (44, 184). A weight-bearing group exercise program designed to improve functional activities of daily living performed significantly better than a flexibility and relaxation program in the areas of stepping reaction time, six-minute walking distance and upper limb reaction times (184).

### Exercise program via allied health assistant

A controlled trial of 180 older general medical patients (aged 65 years or older) in an acute care setting demonstrated improved functional outcomes and reduced length of stay for patients who participated in an inpatient exercise program. In the intervention group, an allied health assistant (under the supervision of a physiotherapist) spent 30 minutes two times a day supporting patients with an individually tailored exercise program in addition to usually prescribed physiotherapy assessment and intervention. The exercise program predominantly consisted of strengthening exercises and was designed to be carried out in a hospital ward setting (46).

## Consider nutrition

A randomised controlled trial by Fiatorone (1994) demonstrated that progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in residential aged care facilities. They found that multinutrient supplementation without concomitant exercise did not reduce muscle weakness or physical frailty in this population (47). Refer to the section on nutrition for more information.

## Consider falls-specific interventions

### Multidisciplinary, multifactorial, health/environmental risk factor screening and falls prevention programs

These interventions are designed to reduce falls in older people across the community, hospital and residential aged care settings (48). Study methods varied in their details of assessment, referral and treatment protocols; however, in most studies, a nurse or other trained health professional made an initial assessment and the patients/residents were provided with advice and referral to appropriate health providers (48).

Evidence suggests that multifactorial interventions in residential settings should include staff education programs, gait training and advice on the appropriate use of assistive devices, and review and modification of medications, especially psychotropic medications (50).

A systematic review by Oliver et al. (2000) investigated whether hospital falls prevention programs work. The review identified seven prospective cohort studies and three randomised controlled trials, which measured multifaceted approaches to falls prevention (49). These multifaceted approaches involve elements of risk assessment, education or awareness programs, equipment checks, labels or bracelets for high risk patients, and use of alarms, restraints or a tailored nursing care plan. The systematic review was unable to identify which element of the falls prevention program was the most effective because study design flaws and small sample sizes affected the power calculations (49). However, falls prevention programs can have an effect on preventing falls in hospitals (49) and the sub-acute setting (45). A recent randomised controlled trial using a targeted falls prevention program in the sub-acute setting, which included a falls risk alert card with an information brochure, exercise, education and hip protectors, demonstrated a significant reduction in falls in the intervention group (45).

### Supervision

If a person is using a gait aid or is acutely unwell, always provide supervision for ambulation and transfers (51). Supervision can be reduced as medical stabilisation occurs and familiarisation with the environment and equipment is achieved. If in doubt, refer to a physiotherapist.

### Address environmental risk factors

A number of environmental risk factors have been identified for falls. These include:

- Inappropriate bed height
- Restraints and cot sides in use
- Bed brakes not on or broken
- Inappropriate chair height
- Call bell out of reach
- Walking aids out of reach, not in good condition or not used properly
- Slippery surfaces and loose floor coverings
- Poor positioning of intravenous drip stand and power cords
- Inadequate lighting
- Inadequate rail and support in bathroom and toilet areas
- General clutter

A comprehensive outline of individual environmental risk factors for falls and recommended actions can be accessed within the Victorian Quality Council falls prevention guidelines (2004 (51).

# Continence

# Continence                                                    *4*

## Links to continence specific guidelines

These current guidelines exist:

- National Ageing Research Institute 2004, *Continence clinic service guidelines: service guidelines for Victorian continence clinic services*, NARI, Melbourne, Australia.

- Registered Nurses Association of Ontario 2003, *Promoting continence using prompted voiding*, RNAO, Toronto, Canada. <www.rnao.org/bestpractices/PDF/BPG_Continence.pdf>

- Royal Australian College of General Practice Western Australian Research Unit 2002, *Managing incontinence in general practice: clinic research guidelines*, (edited version), Commonwealth Department of Health and Ageing, Canberra, Australia.

- Rao, SC 2001, *Practice guidelines: diagnosis and management of faecal incontinence*, American College of Gastroenterology, Iowa, USA

## Summary and recommendations

| CONTINENCE |
|---|
| Continence is the capacity to pass urine or faeces in socially and hygienically acceptable circumstances. |
| Urinary incontinence can be transient or established. Faecal incontinence frequently co-exists with urinary incontinence and might have a shared aetiology. |
| Thirty per cent of women and 20 per cent of men aged 60 years or more and 42 per cent of women and 44 per cent of men aged 75 years or more suffer urinary incontinence. |
| In the community-dwelling population aged over 65 years, faecal incontinence occurs at least once a week in 3.7 people of people, and the rate is substantially greater for residents of aged care homes (10.3 per cent). |
| Urinary and faecal incontinence can already be present on admission to acute and sub-acute care and, in association with other problems, such as cognitive impairment and mobility impairment, is a significant contributing factor to decisions for admission to residential aged care. |

| RECOMMENDATIONS |
| --- |
| Assess older people on admission for the presence of established urinary and faecal incontinence |
| Assess risk for transient urinary and faecal incontinence. |
| Assess need for indwelling urinary catheter. |
| Maintain hydration. |
| Modify environmental factors. |
| Encourage mobilisation and activity. |
| Consider specialist assessment for guidance on interventions appropriate to person and setting, including:<br>• behavioural interventions, such as toileting assistance or bladder training<br>• physical interventions, such as pelvic floor muscle training<br>• pharmacological interventions<br>• surgical interventions or other devices. |
| Consider transitional care needs and community-based strategies. |

## Continence: Evidence Summary

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| **URINARY INCONTINENCE** | | | |
| **Indwelling catheters** | | | |
| *Avoid indwelling catheters where possible* | | | + |
| **Level III-2 evidence:** A causal relationship exists between indwelling catheters and urinary tract infection. Review indication for indwelling catheters daily (52). | | | |
| *Use silver alloy indwelling catheters* | | | + |
| **Level I evidence:** A systematic review suggests silver alloy coated indwelling catheters reduce the risk of urinary tract infection in the short term for hospitalised older people (53). Further economic evaluation is required to confirm that the reduction in infection compensates the cost of silver alloy catheters (53). | | | |
| **Behavioural interventions** | | | |
| *Habit retraining* | ± | | |
| **Level I evidence:** There is insufficient quality of evidence to provide a firm basis of evidence in residential aged care and home settings. There is often overlap between habit retraining and other toileting regimens (54, 55). There should be attempts to determine the micturition pattern for the individual, however, the individual does not have to be an active participant (56). | | | |
| *Prompted voiding* | + | | |
| **Level I evidence:** Limited evidence from five randomised controlled trials suggests prompted voiding increases self-initiated voiding and reduces episodes of incontinence in the short term (56). It is used to teach people with or without cognitive impairment to initiate their own toileting and requires the participation of the individual (56). A prompted voiding schedule requires a three-day voiding record initially to determine the client's toileting needs (57). | | | |
| *Timed toileting* | ± | | |
| **Level I evidence:** A systematic review identified that data were limited and of insufficient quality to provide empirical support for or against the intervention of timed voiding, although timed voiding in combination with other interventions has been shown to reduce incontinence (56, 58). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Address constipation and faecal impaction* | ± | ± | |
| Expert opinion: There is consensus that constipation directly affects continence (57). Refer to the Registered Nurses Association of Ontario nursing best practice guideline, *Prevention of constipation in the older adult population* <http://www.rnao.org.au>. | | | |
| *Pelvic floor muscle training* | + | | |
| Level II evidence: One randomised controlled trial demonstrated a reduction in stress urinary incontinence by 48 per cent following six months of pelvic floor exercises without biofeedback (59). A systematic review identified that pelvic floor muscle training appeared to be an effective treatment for adult women with incontinence; however, methodological limitations existed (60). Pelvic floor muscle training in the older adult might not be as effective, depending on cognitive factors. | | | |
| *Bladder training with biofeedback* | + | | |
| Level I evidence: Bladder training using biofeedback techniques reduced the urinary accidents for stress, urge and mixed incontinence significantly in three randomised controlled trials (59). | | | |
| Pharmacological interventions | | | |
| *Anticholinergic drugs* | + | | |
| Level I evidence: Use of anticholinergic drugs in overactive bladder syndrome results in statistically significant improvement in symptoms. Dry mouth is a common side effect (61). | | | |
| *Adrenergic drugs* | ± | | |
| Level I evidence: Adrenergic drugs have a weak evidence base to support their use over placebo (62). | | | |
| *Tricyclic antidepressant therapy* | ± | | |
| Level II evidence: Few randomised controlled trials have been performed on tricyclic antidepressant therapy with small sample sizes. Effects have been found in nocturia in children and adult incontinence (63, 64). | | | |
| Surgical interventions for women | | | |
| *Open retropubic colposuspension* | + | | |
| Level I evidence: A systematic review identified that open retropubic colposuspension is the most effective treatment modality for stress urinary incontinence, especially in the long term. Laparoscopic colposuspension should allow speedier recovery, but its relative safety and effectiveness is unknown (65). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Periurethral injection therapy for urinary incontinence in women* | + | | |
| **Level I evidence:** A systematic review suggests that periurethral injection of established manufactured bulking agents results in subjective and objective short term improvements of symptomatic female stress urinary incontinence. Further evidence of the patient benefits and cost effectiveness, as well as long term outcomes, is required (66). | | | |
| *Tension-free vaginal taping* | + | | |
| **Level II evidence:** A randomised controlled trial demonstrated that at six months post-operatively, this procedure is as effective as colposuspension, although operative complications are more common with vaginal tape (67). Post-operative complications were more common with colposuspension (67). | | | |
| **Other interventions** | | | |
| *Absorbent products* | + | + | |
| **Level I evidence:** A systematic review identified that disposable products might be more effective than non-disposable products in decreasing the incidence of skin problems, and super-absorbent products might perform better than fluff pulp products; however, tentative conclusions can only be drawn due to poor quality studies (68). | | | |
| *Weighted vaginal cones* | ± | | |
| **Level I evidence:** A systematic review identified 15 studies that assessed weighted vaginal cones. It demonstrated there was some evidence that weighted vaginal cones are better than no active treatment in women with stress incontinence and might be of similar effectiveness to pelvic floor muscle training and electro-stimulation (69). | | | |
| *Post-prostatectomy urinary incontinence interventions* | + | | |
| **Level I evidence:** A systematic review of ten trials identified that there might be some support for pelvic floor muscle training with biofeedback post radical prostatectomy in the early post-operative period (70). | | | |
| *Oestrogens for urinary incontinence in women* | + | | |
| **Level I evidence:** A systematic review identified that oestrogen can improve or cure incontinence and the evidence suggests this is more likely with urge incontinence. Further research into oestrogen type, dose and route of administration needs to occur. Risk of endometrial and breast cancer after long term use suggests oestrogen treatment should be for limited periods, especially for women with an intact uterus (71). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| **FAECAL INCONTINENCE** | | | |
| **Behavioural interventions** | | | |
| *Dietary modification* | | ± | |
| **Expert opinion:** Reducing caffeine or fibre in the diet might be a supportive measure for improving faecal incontinence symptoms where this is associated with loose or watery stools (72). | | | |
| *Habit retraining* | ± | ± | |
| **Level III-1 evidence:** There is insufficient quality of evidence to provide a firm basis of evidence in residential aged care settings (73). | | | |
| *Prompted voiding* | + | ± | |
| **Level III-2 evidence:** Limited evidence from a study suggests that prompted voiding when combined with other protocols, such as fluid prompting and mobility can decrease the frequency of faecal incontinence and increase appropriate faecal voiding in a toilet (74). | | | |
| *Timed toileting* | ± | ± | |
| **Expert opinion:** Developing an individualised toileting regime and toileting the patients/residents according to the regime are of paramount importance for the treatment of faecal incontinence. Refer to the American College of Gastroenterology's *Practice guidelines: diagnosis and management of faecal incontinence (72).* | | | |
| *Address constipation and faecal impaction* | ± | ± | |
| **Expert opinion:** There is consensus that constipation directly affects continence (57). Refer to Registered Nurses Association of Ontario nursing best practice guideline, *Prevention of constipation in the older adult population* <http://www.rnao.org.au>. **Level III-1 evidence:** A randomised controlled trial demonstrated that treatment of constipated patients with faecal incontinence with laxative alone is unsatisfactory. Other contributing major risk factors such as mobility and cognitive impairment need to be considered (75). | | | |
| *Environmental and lifestyle modification* | | ± | |
| **Expert opinion:** Brisk physical activity after meals or on waking and vigorous exercise can enhance colonic motility (76-78). | | | |
| *Biofeedback* | + | + | |
| **Level I evidence:** A recent systematic review of 46 studies (with a total of 1,364 patients) demonstrated a reduction in symptoms of faecal incontinence by 49 per cent. Seventy-two per cent were cured or improved following biofeedback therapy (79). | | | |

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain urinary continence** | **Maintain faecal continence** | **Maintain appropriate use of an indwelling catheter** |
| *Pelvic floor muscle training* | ± | ± | |

**Level III-2 evidence:** A comparative study with concurrent controls identified levator ani failure as the key factor in aetiology of the faecal incontinence. Pelvic floor muscle training appeared to be an effective treatment for adults with anal incontinence; however, methodological limitations existed (80).

| **Pharmacological interventions** | | | |
|---|---|---|---|
| *Antidiarrheal drugs* | | ± | |

**Level II evidence:** Use of antidiarrheal drugs in treating chronic diarrhoea results in statistically significant improvement in symptoms of faecal incontinence; however, adverse effects should be considered (81, 82).

**Expert opinion:** Non-specific antidiarrheal agents decrease intestinal motility and decrease stool frequency, hence reducing the faecal incontinence frequency. Modified stool consistency should also be considered because the formed stool is easier to control. Excessive use of the antidiarrheal, however, might precipitate constipation (83, 84).

| *Laxatives* | | ± | |
|---|---|---|---|

**Level III-2 evidence:** A multicentred study of 22 facilities found that bulk laxatives (Fybogel, Regulan) and suppositories are superior to lactulose and are associated with the lowest rates of faecal incontinence (85).

**Expert opinion:** Suppositories or enemas, though they might cause mild rectal discomfort, minimal bleeding and a burning sensation, tend to be commonly used and effective in treating selected people with incomplete rectal evacuation or those with post-defecation seepage (72, 83).

| *Topical phenylephrine* | | ± | |
|---|---|---|---|

**Expert opinion:** This is not currently approved for the treatment of faecal incontinence (83).

| *Tricyclic antidepressant therapy* | | + | |
|---|---|---|---|

**Level II evidence:** An open-labelled study showed that amitriptyline (20 mg) for four weeks for idiopathic faecal incontinence was statistically significant in decreasing the incontinence score (86).

| **Surgical interventions** | | | |
|---|---|---|---|
| *Sphincteroplasty* | | ± | |

**Expert opinion:** Sphincteroplasty is the appropriate first-line therapy for incontinence related to post-obstetric trauma; however, recent studies have shown this process is beneficial only in the short term (87).

| CONTINENCE | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain urinary continence | Maintain faecal continence | Maintain appropriate use of an indwelling catheter |
| *Dynamic graciloplasty* | | + | |
| **Level I evidence:** A systematic review suggested that dynamic graciloplasty was clearly effective at restoring continence in between 42 per cent and 85 per cent of patients. It was associated with a higher rate of complication and had a significant risk of re-operation. There is a requirement for further evidence of patient benefits and cost effectiveness, as well as long term outcome, particularly for elderly institutionalised people (88). | | | |
| *Implant of an artificial bowel sphincter* | | ± | |
| **Level III-1 evidence:** A prospective multicentred study demonstrated successful outcome results in 85 per cent of patients with a functioning device. Device related complication rates were very high and so was the rate of revisional replacement and retransplant (89). | | | |
| *Sacral nerve stimulation* | | + | |
| **Level II evidence:** In one study that assessed the short-term effect, median incontinence frequency decreased (46). Larger, well designed controlled trials that include clinically important measures are required for conclusive recommendation (90). | | | |
| **Other interventions** | | | |
| *Absorbent products* | + | + | |
| **Level I evidence:** A systematic review identified that disposable products might be more effective than non-disposable products in decreasing the incidence of skin problems and super-absorbent products might perform better than fluff pulp products; however, tentative conclusions can only be drawn due to poor quality studies (68). | | | |
| *Plugs, procon incontinence device, sphincter bulkers* | ± | | |
| **Expert opinion:** Due to the lack of a proper controlled study or long term outcome study, there is no conclusive evidence to recommend use of devices such as anal plugs, procon incontinence devices or sphincter bulkers in treating faecal incontinence (84). | | | |
| *Electrical stimulation* | | ± | |
| **Level I evidence:** A systematic review reported there were insufficient data to draw a reliable conclusion about the effect of electrical stimulation in treating faecal incontinence (91). | | | |

# Continence

Continence is the capacity to pass urine or faeces in socially and hygienically acceptable circumstances (185). Incontinence, in association with other problems, such as cognitive impairment and mobility impairment, is a significant contributing factor to decisions for admission to residential aged care homes (186-188).

Conservative management is the primary method for treating incontinence in this population group; however, surgical options are listed in this section and can be considered when other methods have been trialled.

## 4.1 Aim

To promote and maintain continence of older people across the acute, sub-acute and residential aged care sectors.

## 4.2 Urinary incontinence

Incontinence has been defined as 'the involuntary loss of urine or faeces that may result in problems with hygiene or with participation in everyday life' (189). In older people with urinary incontinence, urodynamic studies have demonstrated quantitative and qualitative changes in bladder function (190); however, incontinence can also occur in older people with normal urodynamic studies. Other factors contributing to continence maintenance need to be considered in a program to prevent functional decline.

Incontinence can be transient or established (due to persisting underlying lower urinary tract dysfunction). Transient incontinence occurs when external processes impact on the urinary tract and may be due to a number of reversible causes (191).

### Table 4: Causes of transient incontinence

| |
|---|
| • Delirium associated with an acute illness, medications or surgery |
| • Infection associated with bladder irritation |
| • Atrophic urethritis or vaginitis |
| • Restricted mobility |
| • Stool impaction |
| • Excessive fluid intake |
| • Psychological illness such as psychosis or depression |
| • Medications (including sedatives, hypnotic agents, calcium channel blockers, alpha-receptor agonists and antagonist agents, loop diuretic agents, non steroidal antiinflammatory agents, ACE-inhibitor agents) |

Transient incontinence can appear suddenly in a person who is otherwise continent. Such reversible factors can also worsen any pre-existing incontinence. Established lower urinary tract dysfunctions include sphincter weakness (stress incontinence), bladder overactivity (urge incontinence), and impaired bladder emptying due to outflow obstruction or bladder muscle failure (overflow incontinence). Many older people or people with a disability might present with functional incontinence. This might be multifactorial and include cognitive factors (failure to recognise need for social toileting) or physical factors (such as poor mobility and dexterity), as well as institutional environmental factors.

These definitions contribute to program planning for prevention of incontinence or to minimisation of symptoms and adverse events secondary to established incontinence in older people admitted to hospital or residential care settings. Causes of transient and functional incontinence can be modifiable and intervention will be directed by comprehensive risk assessment, including a neurological assessment.

## 4.3 Extent of the problem

An Australian community study has documented that 30 per cent of women and 20 per cent of men aged 60 years or older and 42 per cent of women and 44 per cent of men aged 75 years or older have incontinence (192). Incidence rates in the total population of one in 20 are consistent with overseas data (186, 189).

There is limited evidence about primary prevention of incontinence in older people in hospital or residential aged care settings. There are a number of systematic reviews that address management of established urinary incontinence. http://www.health.vic.gov.au/subacute/om_service.pdf

## 4.4 How can the development of urinary incontinence be prevented or minimised?

All risk factors and potential causes of incontinence identified through the comprehensive risk assessment process should be addressed. The aim of the risk assessment process is to inform the implementation of preventive strategies. In the acute care setting, patients are medically unstable and in hospital for a short duration. Accurately identifying a patient's premorbid status might be difficult until discharge or even after discharge. Some of the strategies for managing urinary incontinence and faecal incontinence might therefore be more appropriate in a community-based setting after acute care discharge. However, in the acute care setting, and indeed in the sub-acute and residential aged care settings, reversible factors are common and should be actively identified to promote appropriate modification.

Information about available resources to advise and assist with management in the community and residential care settings is available by calling the Continence Foundation of Australia's National Continence Helpline on 1800 33 00 66.

### Consider general measures

There is consensus that interventions to prevent or treat modifiable contributing causes, such as urinary tract infection, medication, fluid intake, constipation and stool impaction, acute confusional states and environmental barriers to successful toileting, is paramount in maintaining optimal continence function for older people (57, 191). Upper limb dexterity and level of mobility also strongly influence an individual's capacity to self-manage toileting.

*Assess need for indwelling catheter*

Appropriate use of indwelling catheters is important because the incidence of urinary tract infections rises between 5 per cent and 8 per cent each day of insertion (193) and indwelling catheters have been shown to contribute to 40 per cent of all hospital acquired infections (53). It is suggested that indwelling catheters be reserved for patients/residents who have incontinence associated with significant impairment of bladder emptying not amenable to other treatment. An indwelling catheter might also be appropriate for patients with terminal illness and those with pressure ulcers where the incontinence is impeding ulcer healing (186). In the latter two situations, condom drainage is preferable in men where practicable. When necessary, catheters should be used for as short a period as possible (52). The need to use indwelling catheters to monitor urine output in the acutely ill should be considered very carefully and will usually be required only very transiently.

Silver alloy coated indwelling catheters have been shown to reduce the risk of urinary tract infection in older people who are hospitalised for a short time (53). Silver alloy coated indwelling catheters are available in Australia, but they are not routinely used. Further economic evaluation is indicated to confirm cost effectiveness.

## Consider behavioural interventions

Behavioural techniques involve educating the patient/resident, caregiver or both. Positive reinforcement is provided as part of the program. Behavioural techniques can be used in combination with other therapies.

*Toileting assistance*

Caregiver-dependant techniques are safe and suitable for cognitively impaired older people. Toileting assistance has been assessed in recent systematic reviews of habit retraining (54) and prompted voiding (56) in community and residential aged care populations. These interventions include an initial assessment component. The quality of trials included in these reviews was poor to moderate.

Habit retraining involves identifying an incontinent person's toileting pattern and developing an individualised toileting schedule which pre-empts involuntary bladder emptying. The focus is to pre-empt voiding rather than to alter the voiding pattern (54). A review of three trials (337 participants) did not find sufficient evidence to provide conclusive recommendations for this intervention, although the authors acknowledged difficulties in defining the intervention and limitations in assessing such interventions independent of other urinary incontinence strategies. Habit retraining was found to be labour intensive and further evidence, including cost implications in relation to treatment benefit, need to be considered in future research.

Prompted voiding is used to teach people with or without cognitive impairment to initiate their own toileting through requests for help and positive reinforcement from carers (56). One systematic review of three trials (337 participants) was identified. The authors found there was suggestive but inconclusive evidence of short-term benefit from prompted voiding and from the addition of a smooth muscle relaxant (oxybutynin) to prompt voiding. However, in those with cognitive impairment, using agents such as oxybutynin should be with great care in case they cause acute confusion.

Timed (scheduled, routine) voiding was investigated in one systematic review of two trials (298 participants) (54). Both trials used additional and different urinary infection interventions. Data quality was poor and there were too few data to inform conclusive recommendations.

*Bladder training*

Bladder training aims to change the voiding pattern in patients with urinary frequency by increasing the time interval between voids, either by a mandatory or self-adjustable schedule and might take some months to attain (55). A systematic review investigated the effectiveness of bladder training for urinary incontinence. Ten trials (1,366 participants) met review inclusion criteria and were of variable quality. Interventions included scheduled voiding, participant education, relaxation and distraction techniques, self-monitoring and charting and positive reinforcement. The intensity of training varied between trials and duration of intervention ranged from approximately one week to 24 weeks. Bladder training was compared to 'no intervention' (four trials, 427 women), anti-cholinergic drug treatment, adrenergic agonist treatment, other drugs treatment, and other behavioural interventions.

The results demonstrated a trend of bladder training being beneficial, although the results were not conclusive. Lack of data limited the ability to identify sub-groups of urinary incontinence for which bladder training might be more effective. The review did not address the question of whether bladder training is of value in people who have overactive bladder but not urinary incontinence. The majority of trials were community-based and in a relatively young (65 years or under), predominantly female patient population.

*Physical therapies – pelvic floor muscle training*

Pelvic floor muscle training is more effective in, but not restricted to, a younger population group. One systematic review found insufficient evidence of the efficacy of physical therapy as a preventive therapy for urinary incontinence (80). A more recent systematic review found pelvic floor muscle training to be an effective treatment for women with stress or mixed incontinence (60). The review did not clarify the role of pelvic floor muscle training for women with urge incontinence alone and it was difficult to judge if pelvic floor muscle training was better or worse than other treatments. Those who participate in pelvic floor muscle training need to be motivated and committed to adhering to a prolonged program.

## Consider pharmacological interventions

*Anticholinergic therapy*

Anticholinergic agents are used in adults who have symptoms of overactive bladder (urgency with frequency +/– urge incontinence). A systematic review of 51 trials (6,713 participants) summarised evidence relating to seven medications (oxybutynin hydrochloride, darifenacin, emepronium bromide or carrageenate, propiverine, propantheline bromide, tolterodine and trospium chloride) (61). Of these, only oxybutynin and propantheline are used in Australia (194). Tolterodine is available by private prescription from New Zealand and is usually associated with less dry mouth than other locally available agents.

Statistically significant differences favouring oral medication over placebo were found for outcomes of cure/improvement, changes in leakage episodes in 24 hours, number of voids in 24 hours, maximum cystometric volume, and volume at first contraction. The clinical significance of these changes and long-term effects are uncertain. Oral medication was associated with higher residual volumes and a two-and-a-half to three times increased risk of dry mouth. It was suggested that further research investigating alternative delivery systems, such as intravesical, skin patch or slow delivery preparations, is indicated. Dermal and slow release preparations are not available in Australia.

### Adrenergic therapy

One systematic review (15 trials, 832 women) has reported weak evidence in support of adrenergic agonists drugs compared to placebo for the treatment of stress incontinence in women. These medications need to be used cautiously because of frequent minor side effects and rare but serious side effects, such as cardiac arrhythmias and hypertension (62). These side effects are especially of concern in older people, and in practice these agents do not have a clinical place in Australia.

### Tricyclic antidepressant therapy

Amitryptiline and imipramine have been reported to be of use in patients with urge incontinence, particularly at night. The medication acts mainly by an anticholinergic and also has a sedative effect. By increasing outflow resistance, these agents are also sometimes useful in stress urinary incontinence; however, side effects of drowsiness, confusion and postural hypotension limit the effectiveness and safety of these drugs in some older people (63, 64).

## Consider surgical interventions for women

There are surgical interventions that can manage stress and urge incontinence; however, these options are less often appropriate for the client group these guidelines address. Conservative management should be the initial method employed to address urinary incontinence.

### Open retropubic (Burch) colposuspension

A systematic review assessed the effectiveness of open retropubic colposuspension in women with stress or mixed urinary incontinence (65). The authors report this surgical procedure has a lower failure rate than anterior colporrhaphy and that the benefit is maintained over time. It is the most effective treatment modality for stress urinary incontinence. The safety and effectiveness of laparoscopic colposuspension has yet to be determined.

### Open pubovaginal sling procedure

Similar long term results to those for colposuspension have been reported for treating stress urinary incontinence with this procedure.

### Periurethral injection therapy for urinary incontinence in women

Pickard et al (2004) reviewed seven randomised controlled trials or quasi randomised controlled trials (66). Comparing fat injection with placebo did not identify any benefit from the fat injection procedure. One study compared injection therapy with surgical therapy and surgical therapy was associated with better objective outcomes. Four studies compared injection materials and found silicone particles and carbon spheres improved 12-month outcomes and were equivalent to collagen, the most commonly used material. The authors suggest further studies are required before recommendations are made for this therapy as a first-line agent. Improved continence after this procedure is usually not durable (only lasting a few months), making it of limited value. However, it might be a very appropriate consideration in the frail older woman who is only able to cope with local anaesthesia.

### Tension-free vaginal taping (TVT/Sparc/Monarc procedure)

These newer surgical procedures for treating stress urinary incontinence are minimally invasive, can be performed under local or general anaesthesia, and look promising in comparison to open colposuspension (67). A tension-free sling of synthetic material is slung around the mid urethra through a vaginal incision. Results at five-year follow up are similar to those for open colposuspension, however, long term performance is unknown (67).

## Consider investigating lower urinary tract obstruction in older men

Incontinence in institutionalised men is most commonly the result of an overactive bladder. This will be idiopathic due to an underlying neurological disorder, such as stroke, or could be secondary to bladder outflow obstruction. In cases with outflow obstruction, there might be a large residual volume and even overflow incontinence. Admission to hospital can worsen previously impaired bladder emptying for a variety of reasons, including constipation and the use of drugs with anticholinergic action. Incontinence in older men should lead to an assessment of voiding symptoms and the prostate gland and to an ultrasound assessment of residual urine volume.

Lower urinary tract obstruction due to benign prostatic disease can be treated with either prostatectomy or pharmacological means using alpha-blockers. Prazosin is the usual agent, but often causes hypotension. Other such agents are less likely to do this, but are expensive on private prescription.

Anticholinergic drugs should be given with caution to older men because they might exacerbate pre-existing impaired bladder emptying.

## Consider other interventions

### Absorbent products

A recent systematic review investigated the effectiveness of absorbent products for urinary and faecal incontinence (68). Six studies of 415 participants were identified. Data were too few and of poor quality to provide robust recommendations. Disposable products might be more effective than non-disposable products in decreasing incidental skin problems. Super-absorbent products might be superior to fluff pulp products. The cost of absorbent products depends on their constitution.

### Weighted vaginal cones

Weighted vaginal cones are more effective than no active treatment in women with stress incontinence (69); however, the appropriateness of using weighted vaginal cones in older women in the acute, sub-acute and residential sectors needs to be considered. It might be more relevant as an outpatient or community intervention.

### Post-prostatectomy urinary incontinence interventions

A systematic review has investigated the use of conservative interventions for post-prostatectomy urinary incontinence (70). Stress urinary incontinence is well recognised following a radical prostatectomy for carcinoma of the prostate. The relative risk for urinary incontinence for pelvic floor muscle training with biofeedback compared to no treatment was 0.74 (CI 0.6 to 0.93) (70). Too few studies limited analysis for other interventions, such as pelvic floor training alone, transcutaneous electrical nerve stimulation, rectal stimulation or combinations of these. Incontinence in men after transurethral resection of prostate and who empty reasonably well is usually due to bladder overactivity, and might respond to the usual treatments for this dysfunction.

A systematic review assessed 28 trials (2,926 participants) (71). There were limited outcome data available for analysis. The review provided evidence that oestrogen can cure or improve urinary incontinence, but that combined oestrogen and progesterone reduced this likelihood. Beneficial effect was more likely in urge incontinence. Sustained effect after cessation of oestrogen and long-term benefits are unknown. Potential long term effects, such as risk of endometrial and breast cancer, will limit applicability (71). Topical intravaginal oestrogen is widely used in Australia in post-menopausal women. It has been shown to reduce the risk of bacterial cystitis and also to improve symptoms of stress and urge incontinence in the presence of vaginal atrophy. Most women prepared to use it this way tolerate it well.

## 4.5 Faecal incontinence

Faecal incontinence is defined as 'an involuntary loss of anal sphincteric control leading to unwanted release of liquid or solid faeces at an inappropriate time or in an inappropriate place' (195). It is a distressing situation for sufferers and carers, causes great personal disability and is associated with a high financial cost. Faecal incontinence frequently coexists with urinary incontinence and can have a shared aetiology. Moreover, the physical, psychological and social incapacitation of faecal incontinence can be greater. Most sufferers find it embarrassing and socially unacceptable and often fail to present for professional help. This can lead to social restriction and isolation in many instances.

Faecal incontinence can be *passive* (the involuntary discharge of faecal matter or gas without awareness), *urge* (the discharge of faecal matter in spite of active attempts to retain bowel contents), and *faecal seepage* (the leakage of stool following otherwise normal evacuation) (72). Causes can be multifactorial, including neurogenic, traumatic, obstructive, physical or environmental factors (196).

## 4.6 Extent of the problem

Faecal incontinence affects people of all ages but its prevalence is disproportionately higher in women, in older adults, and in residents of aged care homes. A recent study identified that up to 11.2 per cent of the adult Australian population suffers faecal incontinence in any 12-month period (79). A prevalence study found that in the community-dwelling population aged over 65 years, faecal incontinence occurs at least once a week in 3.7 per cent of subjects (197). The rate was greater for residents of aged care homes (10.3 per cent) (79). Another study identified that the rate of faecal incontinence was much higher in institutionalised residents (25–35 per cent) (198), and in hospitalised geriatric patients (10–25 per cent) (198). Faecal incontinence also consumes substantial health care resources. In the United States, the cost of care for incontinence among institutionalised elderly patients is estimated to be between US$1.5 billion and US$7 billion a year (199).

Although faecal incontinence is prevalent and likely to increase in association with an ageing population, there are limited studies relating to management of established faecal incontinence and primary prevention strategies. There are a number of systematic reviews addressing the management of established faecal incontinence in the general population, yet very few targeting older residents of aged care homes and those in hospital inpatient settings.

## 4.7 How can the development of faecal incontinence be prevented or minimised?

All risk factors and potential causes of incontinence identified through the comprehensive risk assessment process should be addressed. The aim of the risk assessment process is to inform the implementation of the preventive strategies, which might include some of the following:

### Consider general measures

The most common cause of faecal incontinence in the elderly is degeneration of the smooth muscle of the internal anal sphincter (that is, the muscle that maintains sphincter closure). Other contributing factors include chronic diarrhoea, faecal impaction, co-morbid conditions, such as neurological diseases, inflammatory bowel diseases, connective tissue disorders, medication, social and environmental circumstances (for example, difficult access to toilet, toileting at specified times), and poor mobility (200, 201).

Aetiology and severity of the condition will guide management of faecal incontinence, however, conservative or non-invasive management should be considered in the first instance. A number of conservative strategies can be used in the management of faecal incontinence (Table 5). Strategies should be chosen for their appropriateness for the individual and the setting. Some interventions might be planned for post–discharge, community-based implementation (195).

### Table 5. Conservative strategies for faecal incontinence

| |
|---|
| • Reduce stool hardness (consider stool softeners) |
| • Assess dietary fibre intake |
| • Maintaining appropriate hydration |
| • Loperamide to increase external anal sphincter tone |
| • Encouraging patients to keep rectum empty |
| • Consider physical therapy including mobilisation and pelvic floor exercises |
| • Modifying environmental factors: easy access to the toilet, regular toileting at accessed times |
| • Evacuation with enema. |
| • Managing chronic diarrhoea |

### Consider behavioural interventions

Behavioural techniques, often collectively termed 'biofeedback', involve educating the patient/resident, caregiver or both on a broad range of issues, such as diet, fluid, techniques to improve evacuation, lifestyle modification, and emotional supports (202, 203). Behavioural techniques can be used in combination with other therapies.

### Dietary modification

Reducing caffeine or fibre in the patient's or resident's diet can be a supportive measure for improving faecal incontinence associated with loose bowel actions due to intestinal hurry (72). Caffeine has been found to enhance the gastrocolonic response and to increase colonic motility (204) and induces fluid secretion in the small intestine (205) causing postprandial urgency and diarrhoea. Fibre supplements increase stool bulk and reduce watery stools and can potentially worsen diarrhoea by increasing colonic fermentation of unabsorbable fibre (72).

In the frail immobile elderly, faecal impaction (with hard or soft stool) is a common cause of faecal incontinence. Sometimes this will be associated with spurious diarrhoea. These patients may benefit from a high fibre diet, with or without specific fibre supplements. Daily food intake and a symptom diary can be used to identify and eliminate items that are causing the symptoms (72).

### Toileting assistance

Immobility and dementia are prime risk factors for the development of faecal incontinence (206). Habit retraining, including timely recognition of soiling, and developing an individualised toileting schedule are of paramount importance (72). There will often be success in toileting after a meal to take advantage of the gastrocolonic reflex.

Two studies have assessed the effectiveness of scheduled toileting programs in reducing the frequency of faecal incontinence (73, 74). In one study where the intervention provided toileting assistance every two hours, residents significantly increased the number of appropriate defecations, but did not significantly decrease the frequency of faecal incontinence (73).

Another study involved a comprehensive intervention which integrated prompted voiding, a fluid-prompting protocol and mobility exercise. This resulted in a significant decrease in the frequency of faecal incontinence (from 0.6 to 0.3 episodes a day) and a significant increase in appropriate faecal voiding in the toilet (74).

### Environmental and lifestyle modification

Physiological events such as brisk physical activity, particularly after meals or immediately after waking, (76, 78) and acute or vigorous exercise (77) may enhance colonic motility, precipitating faecal incontinence.

### Biofeedback therapy

There are three main modalities of biofeedback therapy described (195): use of an intra-anal electromyographic sensor (a probe to measure intra-anal pressure or peri-anal surface electro-myographic electrodes to teach the patient how to exercise the anal sphincter) (72), use of a three-balloon system to train the patient to correctly identify the stimulus of rectal distension and to respond without delay (196), and the use of a rectal balloon to retrain the rectal sensory threshold, usually with the aim of enabling the patient to discriminate and respond to smaller rectal volumes (207).

Recent systematic reviews have assessed biofeedback therapy. A Cochrane Review of controlled studies of biofeedback and exercises for faecal incontinence conducted in 2003 did not provide sufficient evidence with which to judge the effectiveness of sphincter exercises or biofeedback therapy in reducing faecal incontinence (208). This might be due to the limited number of studies reviewed, poor methodological qualities of the included studies, and heterogeneity in the results among the studies.

A recent systematic review of biofeedback studies included 46 studies (with a total of 1,364 patients). Of studies with adequate data, 275 out of 566 patients (49 per cent) were cured of faecal incontinence symptoms following biofeedback therapy, and 617 out of 861 (72 per cent) patients were reported to be cured or to have improved. The criteria for success on these studies varied from a 90 per cent reduction to a 50 per cent reduction in episodes of incontinence. Methodological limitations, including a wide subject age range (six to 97 years), methodological variation, and poor quality of the included studies, prevent the possibility of conclusive and precise recommendations (209).

Older people living in residential aged care settings might not be the appropriate target group for this intervention as biofeedback involves conditioning patients to be more sensitive to a stimulus distending the rectum and to heighten the voluntary muscle sphincter response, with the patient watching or listening to a feedback signal of the level of external sphincter contraction. This requires a motivated patient with adequate cognitive function.

### Physical therapies – pelvic floor muscle training

Pelvic floor muscle training probably has less significance in the older population than in the younger population group. One systematic review found insufficient evidence to determine whether or not pelvic floor muscle training, any physical therapy or combination of physical therapies is effective in preventing faecal incontinence (80).

A more recent trial looking at the significance of the pelvic floor muscles in faecal incontinence found that the levator ani plays an important role in preserving anal continence and its failure can be an indicator for predicting the treatment response. Pelvic floor muscle training can be an effective treatment for this process (210).

## Consider pharmacological interventions

Diarrhoea and constipation are major risk factors for faecal incontinence (72, 196, 211) and most of the pharmacological interventions are primarily directed at addressing these symptoms. A systematic review of 11 trials (452 participants) found inconclusive evidence for using drug therapy for faecal incontinence in adults compared with either conservative treatment or surgery (212).

### Antidiarrheal (constipating) agents

Loperamide hydrochloride, codeine phosphate and co-phenotrope (diphenoxylate and atropine) are the most commonly used antidiarrheal agents. In a double-blind cross-over study of 30 subjects with chronic diarrhoea, all three agents were associated with some degree of success in decreasing stool frequency, but loperamide hydrochloride and codeine were more effective in decreasing the sense of urgency (81, 83). The specific benefit of loperamide hydrochloride in treating faecal incontinence was observed in a placebo-controlled trial of loperamide hydrochloride (4mg three times a day), in which it was shown to reduce frequency of incontinence, to improve stool urgency, to increase anal canal resting pressure, and to improve the ability to retain saline infused into the rectum (82, 83).

Adverse effects should be considered. Loperamide hydrochloride can be associated with constipation and abdominal pain (81), codeine can cause drowsiness and substance addiction, and diphenoxylate/atropine can cause dryness of mouth (72). Therefore, careful titration of the dosages according to clinical symptoms is required to produce the desired effect (72).

### Fibre supplements (bulk forming agents)

Kaopectate, psyllium and gum agar are a few of the commonly used agents in this group. These agents can alleviate mild chronic diarrhoea by absorbing water and increasing stool bulk and possibly by creating the perception of decreased stool fluidity. However, there have been few studies conducted to evaluate their effectiveness. A placebo-controlled trial showed that fibre supplements (psyllium and gum agar) tend to be associated with the formed stool and were effective in reducing incontinence in patients with faecal incontinence associated with loose or watery stools (83, 213).

### Laxative agents

Lactulose, a galactose-fructose disaccharide, is the most commonly used laxative agent in the aged. For faecal incontinence associated with constipation or faecal impaction, regular laxative use can normalise the stool consistency. A multicentred study of 22 facilities did not find sufficient evidence to support a conclusive recommendation. The authors did find that bulk laxatives (Fybogel, Regulan) and suppositories are associated with lower rates of faecal incontinence and should be used preferentially, even in immobile older people (85). Fibre supplements in Australia also include Metamucil, Normacol and Granocol.

A randomised trial of 206 residents of five long term care units found that laxative regimens were effective in reducing the frequency of faecal incontinence (75). Suppositories (glycerine, bisacodyl) or enemas are effective in treating selected people with incomplete rectal evacuation or those with post-defecation seepage, although they might cause mild rectal discomfort, minimal bleeding and a burning sensation (72, 83). Authors of this study found stimulant laxatives and polyethylene glycol to be more effective than enemas (75).

### Topical phenylephrine

Phenylephrine gel, which is supposed to cause internal sphincter contraction, is currently not approved for treating faecal incontinence (83).

### Tricyclic antidepressant agents

Amitriptyline use has been reported for patients with idiopathic faecal incontinence. A recent study of 18 patients (two men) with idiopathic faecal incontinence reported that amitriptyline (20 mg) for four weeks reduced faecal incontinence scores. Seventy-two per cent had full remission of the symptoms with complete stool control at the six-month follow-up. However, side effects, such as drowsiness and confusion, can limit its use (86).

## Consider surgical interventions

In older people, surgical interventions should be considered only for the patient with major faecal incontinence who has failed to respond to non-invasive conservative therapies (202). Surgical procedures include sphincteroplasty and newer treatments, such as injectable silicone implants and sacral nerve stimulation (214). Sphincteroplasty is most appropriate if there is a discrete sphincter defect. Injectable silicone implant and sacral nerve stimulation have low morbidity (215, 216).

There are no published reports comparing surgical management with other non-invasive therapies, such as biofeedback therapy or pharmacological therapy, and no controlled studies attempt to compare the different surgical approaches. A systematic review assessing the effectiveness of surgery for faecal incontinence in adults reported inconclusive evidence and was unable to make specific recommendations (217).

### Sphincteroplasty

Sphincteroplasty (sphincter repair) is appropriate therapy for incontinent individuals with significant sphincter defects, particularly secondary to obstetric-related structural damage. However, recent studies have shown this process seems to be beneficial only in the short term and results tend to deteriorate with time (87). The majority of the trials were community-based and focused on the post-obstetrics trauma (87). Outcomes were reported to be less favourable if there had been damage to the pudendal nerve that supplies the pelvic floor (218).

### Injectable silicone implant

This is an injectable treatment to increase the bulk of the internal anal sphincter and thus improve passive faecal incontinence. The injected silicone (PTPTM implant) forms a template to allow ingrowth of collagen tissues and clinically may take four to six weeks before any improvement. The improvement may continue up to 12 months after injection. In a large randomised trial undertaken in Melbourne, the procedure was found to be effective for passive faecal incontinence, safe and able to be performed as a day case (215).

### Sacral nerve stimulation

This new procedure involves neuromodulation of the sacral nerve (usually S3), which innervates the rectum and pelvic floor. Sacral nerve stimulation is ideally suited for severe faecal incontinence due to multiple pathology, including pudendal nerve damage, and internal and external sphincter damage. The procedure initially involves a screening phase with peripheral nerve evaluation for one week to assess for effectiveness. This screening test has a very high positive predictive value in that a positive test would strongly predict a good outcome with the definitive sacral nerve implant. The self-retaining sacral nerve electrode is inserted using a minimal access technique and the neurostimulator, the size of a small cigarette lighter, is implanted in the buttock or lower abdominal wall. The patient can switch the neurostimulator on or off, similar to a pacemaker technology. The procedure has low morbidity and has provided good results for patients with end-stage faecal incontinence (90, 216).

### Dynamic graciloplasty

A muscle transfer procedure, such as dynamic graciloplasty, is a newer approach in which fast twitch fatigable muscle is transformed into a slow twitch fatigable muscle, which can provide a sustained, sphincter-like muscle response (196). A systematic review reported the clinical improvement rates ranged between 42 per cent and 85 per cent; however, it was associated with 2 per cent mortality, higher rates of complications and significant risk of re-operation (88). As a result, the Federal Drug Administration did not approve this technique.

*Artificial bowel sphincter*

Another experimental approach involves implanting an artificial bowel sphincter. The device is placed around the native sphincter via peri-anal tunnels. A multicentred prospective study (115 patients) looked at the safety and efficacy of the artificial bowel sphincter and found a successful outcome in 85 per cent of patients with a functioning device. Using an intention to treat analysis, the success rate was 53 per cent. However, there was a very high incidence of device related adverse events and 46 per cent of the patients required revision or replacement and 37 per cent had their device completely explanted due to infection (89).

## Consider other interventions

*Absorbent products*

A recent systematic review investigating the effectiveness of absorbent products for urinary and faecal incontinence included six studies with 415 participants. In spite of a lack of quality studies and uniform data, treating faecal incontinence with absorbent products has benefits. This review showed disposable products might be more effective than non-disposable products in decreasing skin problem incidents and super-absorbent products might perform better than fluff pulp products (68).

*Plugs, procon incontinence device, sphincter bulkers*

Anal plugs might be useful for selective patients with impaired anal canal sensation or neurological diseases and for institutionalised and immobilised patients. They are designed to temporarily occlude the anal canal (84). Procon incontinence devices have been used for severe faecal incontinence. The device consists of a rubber catheter with an infrared photo-interrupter sensor and flatus vent holes. Due to the procedure's complexity, its use might be quite limited in the older population across the acute, sub-acute and residential aged care sectors (84).

A variety of agents, including autologous fat, glutaraldehyde-treated collagens and silicon, have been tried as a means of bulking the anal sphincter to augment its surface area and thereby better seal the anal canal. Studies have shown some short term improvements in patients with passive faecal incontinence (219, 220). As a result of the lack of proper controlled or long-term outcome studies, the benefit of these techniques cannot be confirmed.

*Electrical stimulation*

This technique is used to apply intermittent trans-anal electrical stimulation to the anal canal using an electrode attached to a portable stimulator in an effort to stimulate the muscle contraction (84).  A systematic review reported there were insufficient data to draw a reliable conclusion about the effect of electrical stimulation in treating faecal incontinence (91).

# Nutrition

# Nutrition

*5*

## Links to nutrition specific guidelines

No current guidelines for nutritional assessment and prevention of functional decline were identified.

## Summary and recommendations

| NUTRITION |
|---|
| Malnutrition is a major cause of functional decline and increased morbidity and mortality in older people. |
| Malnutrition is common in the older person and can be broadly divided into inadequate macro nutrition (protein, energy malnutrition) and inadequate micro nutrition (vitamin deficiency). |
| Two important functions of adequate nutrition in the older person are the maintenance of muscle strength and of bone strength. |
| The prevalence of protein energy malnutrition ranges from 25–65 per cent of institutionalised older people without acute diseases. |
| Prevalence of malnutrition in hospitalised patients has been shown to be 36 per cent and has been associated with increased length of stay, increased infection rates and increased mortality. |

## RECOMMENDATIONS

Assess the nutritional status of older patients or residents, including vitamin D status

There is insufficient evidence for providing dietary advice alone in the management of illness related malnutrition.

Consider nutritional interventions for those who are malnourished or at risk of malnourishment. These include:

- increasing the nutrient density of food via supplementation of food, vitamins and drinks
- making snacks available between meal times
- offering fluids to people at regular intervals.

Ensure adequate intake of vitamin D.

- All people over the age of 65 years should have a daily vitamin D intake of at least 400 IU a day.
- Older people at higher risk of vitamin D insufficiency or deficiency (for example, those who are housebound or in residential care) should have a daily vitamin D intake of at least 800 IU a day. Patients/residents with documented vitamin D deficiency might require higher doses of vitamin D replacement. Consider specialist referral for guidance.
- Oral vitamin D supplementation for older people should be given in association with calcium supplementation of at least 800 mg a day for men and 1000 mg a day for women.

Promote non-dietary interventions, which encourage independent eating.

- Ensure appropriate set up of plate at meal time, with appropriate assistive devices.
- Optimise the patient's or resident's position at meal times (for example, sitting out of bed).

Assess and treat co-morbidities that contribute to malnutrition risk:

- depression
- nausea and vomiting
- dentition and oral hygiene problems.

## Nutrition: Evidence Summary

**+** = demonstrated positive effect

**–** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| NUTRITION | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Maintain micro nutrition** | **Maintain macro nutrition** | **Maintain hydration** |
| **Dietary interventions** | | | |
| *Increase the nutrient density of food.* | ± | | |
| **Expert opinion:** Increase the protein content by adding milk powder, egg whites or tofu. Increase the fat content by adding butter, margarine or oil and sauces and gravy. | | | |
| *Make snacks available between meal times.* | ± | ± | |
| **Expert opinion:** Make snacks available between meal times and offer snacks as part of a defined between meal snack program which might increase the likelihood of individuals eating between meals. | | | |
| *Consider giving daily multivitamin and mineral supplements.* | | ± | |
| **Expert opinion:** Consider giving daily multivitamin and mineral supplement to people whose food consumption is marginal. | | | |
| *Oral nutritional supplements* | + | + | |
| **Level I evidence:** A systematic review of 31 trials identified that supplementation with oral nutritional supplements appeared to produce a small but consistent weight gain. There was a statistically significant effect on mortality and reduced length of stay (92). | | | |
| *Dietary advice* | ± | ± | |
| **Level I evidence:** There is insufficient evidence for providing dietary advice alone in the management of illness related malnutrition. Oral nutritional supplements or supplements in combination with dietary advice, rather than advice alone, might be more effective in enhancing weight gain (93). | | | |
| **Vitamin D and Vitamin D analogues** | | | |
| *Supplementation of vitamin D3 and calcium* | + | | |
| **Level I evidence:** A systematic review demonstrated that vitamin D alone without calcium supplementation does not reduce incidence of hip fracture. Administering vitamin D3 with calcium co-supplementation to frail older people in sheltered accommodation does reduce hip fracture incidence (94). A meta analysis demonstrated that vitamin D reduced the risk of falls by 22 per cent (95). | | | |

| NUTRITION | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | Maintain micro nutrition | Maintain macro nutrition | Maintain hydration |
| *Supplementation of vitamin D3 and calcium* | ± | ± | |

**Expert opinion:** All people over the age of 65 years should have a daily vitamin D intake of at least 400 IU a day. Those older people at higher risk of vitamin D insufficiency or deficiency (for example, those who are housebound or in residential care) should have a daily vitamin D intake of 800 IU a day. Oral vitamin D supplementation for older people should be given in association with calcium supplementation of at least 800 mg a day for men and 1000 mg a day for women (96, 97).

| Non-dietary interventions | | | |
|---|---|---|---|
| *Treat depression* | ± | ± | ± |

**Expert opinion:** Appetite loss is a symptom of depression. By treating depression, appetite is stimulated.

| *Manage nausea* | ± | ± | ± |
|---|---|---|---|

**Expert opinion:** The presence of nausea or vomiting might indicate medication side effects or a gastrointestinal, hepatobiliary or renal disorder. All medications should be reassessed for continued indications, potential side effects and interactions that might affect nutritional status.

| *Correct any dentition problems.* | ± | ± | ± |
|---|---|---|---|

**Expert opinion:** The status of dentition should be considered in the assessment of older people in acute, sub-acute and residential aged care and corrected where possible.

| *Exercise* | + | + | |
|---|---|---|---|

**Level II evidence:** Progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in long term care (47).

| *Promote independent eating* | ± | ± | ± |
|---|---|---|---|

**Expert opinion:** Provision of assistive devices, such as plate guard, built-up cutlery and beaker with fitted lid, will enhance the patient's or resident's ability to remain independent in eating and drinking.

| *Positioning* | ± | ± | ± |
|---|---|---|---|

**Expert opinion:** Sitting out of bed for meals will place the individual in a better position to reach meal items and to feed oneself successfully.

| Maintaining oral hydration | | | |
|---|---|---|---|
| *Regular presentation of fluids to older person* | | | + |

**Level II evidence:** Regular presentation of fluids every one-and-a-half hours to bedridden residents of residential aged care facilities helps to maintain fluids (98).

# Nutrition

Good nutrition is important for many aspects of health. A healthy balanced diet ensures adequate intake of all necessary macro and micronutrients.

## 5.1 Aim

To provide adequate nourishment and hydration in a way that ensures the comfort and safety of the patient/resident. Recommendations within these guidelines pertain to oral feeding only. The guideline does not provide recommendations for percutaneous endoscopic gastrostomy feeding or nasogastric feeding, although similar principles might apply in these situations.

## 5.2 Malnutrition

Malnutrition might be associated with adverse consequences, but remains largely unrecognised (221). The risk of malnutrition should be assessed using a comprehensive risk assessment, which includes assessment of dietary and hydration needs, cultural preferences and physical abilities.

Reasons for poor nutritional status in older people are multifaceted and include psychological, physiological and social changes associated with ageing which affect food intake and body weight. The risk of malnutrition might be further increased by the presence of illness or disease. Some of the causes of inadequate nutrition for the older person include reduced dexterity for food preparation and feeding, food dislikes, impaired smell, poor oral hygiene or impaired absorption of nutrients.

Malnutrition is often associated with disorders such as depression and cognitive decline (92). The presence of swallowing disorders can also influence malnutrition and dehydration and these effects are often underestimated. The prevalence of swallowing disorders is as high as 30–60 per cent in older people with a disability living in residential aged care facilities (222). The age-associated changes coupled with other social, psychological and physiological changes can severely impact on the ability of an older person to maintain their nutritional requirements.

Malnutrition is a major cause of functional decline and increased morbidity and mortality in older people (92). Two important functions of adequate nutrition in the older person are to maintain muscle strength and bone strength. Osteoporosis is characterised by low bone mass and reduced quality of the bone structure. Factors contributing to the risk of osteoporosis include reduced physical activity, low dietary calcium, cigarette smoking, alcohol consumption and medications, such as corticosteroids (223). Bone strength can also be influenced by vitamin D deficiency, which causes impaired bone mineralisation (osteomalacia). Adequate levels of vitamin D are essential for optimal bone strength. Up to 75 per cent of aged care residents are vitamin D deficient (224, 225). In addition to effects on bone strength, inadequate vitamin D is associated with muscle weakness, particularly proximal muscle groups, and is associated with increased falls risk (226).

A low body mass index has also been shown to increase the risk of injury, particularly fracture, in the event of a fall (227).

## 5.3 Extent of the problem

Malnutrition is common in older people and can be broadly divided into inadequate macro nutrition (protein or energy malnutrition) and inadequate micro nutrition (vitamin deficiency). In one study, the prevalence of malnutrition in two Sydney acute hospitals was 36 per cent (228). International studies have reported prevalence rates of 40 per cent of patients admitted to an acute hospital in the United Kingdom (221) and 35–65 per cent of older inpatients in the United States (221). Twenty-nine per cent of patients admitted to sub-acute care in another United States study were malnourished (229). The prevalence of protein energy malnutrition ranges from 25–65 per cent of institutionalised older people without acute diseases (230). In hospitalised patients, malnutrition has been associated with increased length of stay, increased infection rates and increased mortality (228, 229, 231). Malnutrition in the older person is associated with increased infection rates, including pneumonia and uro-sepsis.

## 5.4 How can malnutrition be prevented or minimised?

All risk factors and potential causes of malnutrition identified through the comprehensive risk assessment process should be addressed where possible. The aim of the risk assessment process is to inform the implementation of preventive strategies, which might include some of the following:

### Consider dietary interventions

*Nutritional supplementation*

Malnutrition can be specifically reversed through nutritional support (92). If a patient/resident does not consume enough food, consider options for supplementation:

- Increase the nutrient density of food. Increase the protein content by adding milk powder, egg whites or tofu. Increase the fat content by adding butter, margarine or oil and sauces and gravy.
- Make snacks available between meal times.
- Consider giving daily multivitamin and mineral supplements.
- Consider packaged nutritional supplements. Oral nutritional supplements can be nutritionally complete or provide mononutrients, such as protein or energy, or provide specific nutrient support. Nutritional supplements have become a widely accepted means of improving nutritional status.

A systematic review by Milne et al. (2004) included 31 trials (2,464 participants). The results demonstrated that nutritional supplements can produce a small and consistent weight gain and that there might also be a beneficial effect on mortality and reduced length of stay in hospitalised patients. However, there was little evidence of the benefit to functional outcomes (92).

### Compliance

Nutritional supplements often come as sweet tasting drinks. Compliance with supplementation is a major problem (231). Poor palatability can be addressed by:

- timing supplements. Serving supplements in between meal times means they do not conflict with meals
- serving supplements on ice or chilled to reduce the sweetness

- serving supplements with a straw, which will reduce the impact of the smell and make them easier to consume

- providing assistance for those who require help to consume the supplements, which will increase nutritional intake

- considering the supplement as a therapeutic intervention with the same importance as taking medications as opposed to serving it as an addition to a meal.

<div style="border:1px solid #ccc; padding:1em; background:#e8e4c0;">

### People recovering from hip fracture – acute and sub-acute care

A systematic review by Avenell and Handoll (2004) assessed the effects of nutritional intervention in older people recovering from hip fracture (232). Many older people with hip fracture are malnourished when admitted to hospital and have poor food intake in hospital. Undernutrition is linked to more complications after surgery and could delay recovery.

The review looked at trials using nutritional supplements for older people with hip fracture. Seventeen randomised trials involving 1,266 participants were included. The reviewers stated that the quality of the trials was poor, with small sample sizes and inadequate assessment of outcome. Oral supplements providing energy and protein were of potential benefit, but more research is needed.

There was no evidence that malnourished patients are more likely to benefit from multinutrient supplementation than those who are not malnourished. There was no evidence for the benefits of nasogastric feeding in patients recovering from hip fracture and the authors stated this intervention should probably be reserved for the very malnourished with extremely poor intakes not responsive to oral supplementation (232).

</div>

### Dietary advice

It has been suggested dietary counselling can be an effective intervention to encourage the use of energy and protein rich foods because it can be tailored to individual eating habits. However, a Cochrane Systematic review concluded there was lack of evidence for provision of dietary advice in the management of illness-related malnutrition. The reviewers suggested that oral nutritional supplements are more effective than dietary advice in improving body weight and energy intake with people with illness-related malnutrition (93).

### Food quality

Australia has recommended dietary requirements (RDI) for most essential nutrients and energy. The RDI is the amount of each nutrient required to adequately meet the nutritional needs of practically all healthy Australians. Many RDI are generous to accommodate all individual variations in metabolism and absorption of nutrients. Individual needs are best assessed via a dietitian.

A review of the Australian nutritional RDI is underway and an update can be found on the Dietitian Association of Australia web site, <www.daa.asn.au>. There is a manual which addresses the food and nutrition requirements of residents in aged care facilities and should be widely available in all residential aged care facilities. The manual is titled, *Best practice food and nutrition manual for aged care facilities*, and is available from the Australian Nursing Homes and Extended Care Association <www.anheca.com.au>.

### Consider vitamin D and vitamin D analogues

Vitamin D3 (cholecalciferol) is synthesised in skin from 7-dehydrocholesterol during exposure to sunlight. Brief sunlight exposure of the arms and face provides the equivalent of up to 200 IU vitamin D ingested orally (233). Endogenously synthesised and dietary vitamin D is metabolised in the liver and activated to 1,25 dihydroxy vitamin D (calcitriol) in the kidney. Few foods other than fatty fish livers (tinned fish in oil), eggs, milk and margarine contain vitamin D.

#### *Effects of vitamin D deficiency*

Calcitriol is important for maintaining normal plasma calcium and phosphate concentrations. In adults, a deficiency of vitamin D is associated with hypocalcemia, hypophosphatemia and osteomalacia. Low plasma calcium results in secondary hyperparathyroidism. An association has been demonstrated between vitamin D levels and bone density (234, 235). In a study of patients with hip fracture, 30 per cent were shown to have osteomalacia on histological examination (236, 237). An association between vitamin D deficiency and risk of falling was reported in a pilot study (238). A longitudinal study of older women in residential care supported this association (239).

#### *At-risk populations*

Vitamin D deficiency is associated with low dietary intake, reduced sun exposure, and liver and renal disease. The elderly are especially at risk because their vitamin D intake is often low, while cutaneous vitamin D production and vitamin D stores decline with age (240, 241) and there might be intestinal resistance to 1,25-dihydroxy vitamin D (242).

Vitamin D deficiency has been documented in older people confined indoors (243), in patients hospitalised in general medical wards (57 per cent deficient) (244), in patients with hip fracture (245), and in residents of long term care facilities (246-249). Flicker et al. (2003) reported that 22 per cent of residents in low level care and 45 per cent in higher level care had vitamin D levels below the reference range and almost all the other residents were in the lower half of the reference range (249).

#### *Benefits of supplementation - Bone loss and fractures in older people*

A systematic review reported no reduction in hip fracture when vitamin D was used without calcium co-supplementation (94). It remains unknown whether vitamin D3 alone reduces the incidence of non-vertebral fractures. Administering vitamin D3 with calcium co-supplementation to 2,790 frail older people (with a mean age of 81 years) in sheltered accommodation was effective at preventing hip fractures (94). This effect was not confirmed in a younger community-dwelling population (with a mean age of 71 years); however, the study was not adequately powered to show an effect (94).

Physiologic doses of vitamin D (700 IU a day) in association with calcium (500 mg a day) reduced bone loss and decreased fracture rate in men and women aged 65 years or older over a three-year period (250). In community-dwelling older people, vitamin D alone did not influence fracture rate (251). A high dose intermittent therapy (100,000 IU every four months), given for five years to people aged 65 years and older reduced the fracture risk without any adverse effects (252).

### Falls

Vitamin D supplementation might reduce the risk of falls. A meta analysis of five randomised controlled trials (1,237 participants) reported older people treated with vitamin D had a 22 per cent reduced risk of falls compared with older people treated with calcium or placebo. The number of people needed to treat to prevent one fall was 15 (95).

### Recommended dosage

The optimum serum vitamin D level is uncertain. The threshold of 25 hydroxyvitamin D that triggers secondary hyperparathyroidism has been reported to be between 60 nmol/l and 83 nmol/l—well above the lower limit of most current laboratory reference ranges (247). It is recommended that the daily vitamin D intake in people 65 years or older should be at least 400 IU per day and for those at higher risk, especially if housebound, 800 IU per day (96). Higher doses might be required for those who are vitamin D deficient. It is also recommended that vitamin D be given in association with calcium: 1000 mg per day (women) and 800 mg per day (men) (97).

### Consider non-dietary interventions

In addition to dietary interventions, it is important to consider non-dietary ways of improving the nutritional intake of older people at risk of malnutrition, such as treating depression, adequately recognising and managing nausea, correcting dental problems, implementing exercise regimes and positioning and providing assistive devices.

### Treating depression

Following initiation of antidepressant therapy, a patient's or resident's food intake often improves because the depression symptom of appetite loss is addressed. Serotonin is an appetite stimulant and can assist with achieving nutritional support.

### Nausea

The presence of nausea or vomiting might indicate medication side effects or a gastrointestinal, hepatobiliary or renal disorder. Reassess all medications for continued indications, potential side effects and interactions that might affect nutritional status.

### Dentition and mouth care

A cross-sectional survey of 5,958 British people aged 50 years and older demonstrated dental health is closely associated with nutritional status (253). This suggests the dentition status should be considered in the assessment of older people in acute, sub-acute and residential aged care and corrected where possible. An Australian study identified that the number of edentulous residents was 63 per cent in residential aged care facilities, with up to 25 per cent of these residents not wearing their dentures. This raises obvious issues, with edentulous residents losing more body weight, eating fewer foods, being more likely to be on a softened or vitamised diet, and having dental pain or problems (254).

An improved understanding is required of the relationship between residents' nutritional status, swallowing problems, medication use, behavioural problems, oral health status, denture problems and oral hygiene status (254). Poor oral hygiene also influences the ability to eat. The presence of oral thrush or another infection can inhibit the client's ability to eat. Regular mouth toileting can help to maintain oral hygiene.

### Exercise

A randomised controlled trial by Fiatorone (1994) demonstrated that progressive resistance exercise training is required in addition to nutritional supplementation to produce a significant improvement in muscle strength and function in older people in long term care. They found that multinutrient supplementation without concomitant exercise did not reduce muscle weakness or physical frailty in this population (47).

### Promote independent eating

Providing assistive devices, such as a plate guard, non-slip place mat, built-up cutlery and beaker with fitted lid, will enhance the patient's or resident's ability to remain independent in eating and drinking.

### Positioning

Appropriate posture and sufficient support are important to ensure the person is placed in an optimal position to reach meal items and to swallow safely and effectively. Sitting out of bed for meals where possible is strongly encouraged.

Ensure the person is able to easily open packaging around food and utensils and offer assistance where required. Food containers and lids should be opened where appropriate to aid recognition of food and to stimulate appetite.

## Maintain oral hydration

Older adults are identified as being particularly susceptible to dehydration. Decreases in renal perfusion and sensitivity to anti-diuretic hormone can contribute to dehydration in older adults. The sense of thirst also appears to diminish in older adults. There is additional risk if there are mobility problems, confusion or dementia, and pathological conditions, such as hypertension, heart and renal disease (98).

A systematic review by Hodgkinson et al. (2003) found one randomised controlled trial, which addressed management of hydration in older adults and fulfilled review criteria. The study found that offering fluids every one-and-a-half hours throughout the day to bedridden residents maintained hydration at a significantly higher level than did three-hourly bed checks with no prompting of residents to drink fluids. However, the study sample size was small and did not address the issue of uncooperative patients who refuse to drink.

## Be wary of refeeding syndrome

Refeeding syndrome is an underappreciated entity characterised by acute electrolyte derangements, notably hypophosphatemia. This syndrome tends to occur when a person resumes nutritional intake following a suboptimal oral caloric intake. The aetiology and risk factors for refeeding syndrome include prolonged starvation, anorexia nervosa, prolonged vomiting and diarrhoea, prolonged nasogastric suction, recent major surgery, recent history of cancer, alcoholism, being an older person, homelessness and hunger strikers (255).

Refeeding syndrome is classically associated with total parenteral nutrition, but enteral nutrition and even oral feeding can precipitate hypophosphatemia. Adverse effects of hypophosphatemia include cardiac failure, muscle weakness, immune dysfunction and death (255).

The most important facet of treating refeeding syndrome-induced hypophosphatemia is recognising those at risk and closely monitoring serum phosphorous levels (255). Appropriate medical management and dietetic support are essential.

# Skin integrity

# Skin Integrity                                          *6*

## Links to skin integrity specific guidelines

- Australian Wound Management Association 2003, *Clinical practice guidelines for the prediction and prevention of pressure ulcers*, AWMA, Perth. <http://www.awma.com.au>

- National Institute for Clinical Excellence 2003, *Pressure ulcer prevention: pressure ulcer risk assessment and prevention, including the use of pressure-relieving devices (beds, mattresses and overlays) for the prevention of pressure ulcers in primary and secondary care*, NICE, London. <http://www.nice.org.uk/pdf/PRD_Fullguideline.pdf>

- Rycroft-Malone, J & McInness, E 2000, *Pressure ulcer risk assessment and prevention. Technical report*, Royal College of Nursing, London.

## Summary and recommendations

| SKIN INTEGRITY |
|---|
| Many terms are used to describe skin breakdown, including pressure ulcers, pressure areas, pressure sores, bedsores, ischaemic ulcers and decubitus ulcers. |
| Pressure areas occur when the soft tissue is compressed between bony prominences and an external surface for a long time. |
| The intensity and duration of pressure is related to factors that impede mobility, activity and sensory perception. |
| Australian pressure ulcer prevalence rates range from 13–37 per cent. Incidence rates range between 5.4 per cent and 11 per cent. |
| International pressure ulcer prevention strategies have been shown to reduce pressure ulcer incidence by up to 30 per cent. |
| Maintaining skin integrity is important because pressure areas are associated with pain, reduced mobility, increased risk of in-hospital complications, and increased health care costs associated with prolonged length of stay. |

## RECOMMENDATIONS

Perform a pressure ulcer risk assessment on patients/residents on admission

Perform a daily skin integrity assessment on older patients/residents at risk of pressure ulcers.

Optimise skin hygiene.
- Keep skin clean and free from all potentially irritating substances or those that affect skin pH.
- Use topical moisturiser.
- Avoid high skin temperature by avoiding skin contact with plastic surfaces.
- Prevent or minimise effects of incontinence.

Maintain adequate nutrition.

Maintain adequate hydration.

Maintain mobility.

Review mechanical loading and support surface measures.
- Ensure patients/residents do not remain in one position for longer than two hours.
- Avoid prolonged sitting in a chair or wheelchair.
- Consider use of high specification foam mattresses.
- Reduce heel pressure by using pillows or foam under the whole length of the lower leg. **Do not use air filled vinyl boots to reduce heel pressure.**
- Consider using pressure relieving overlays on operating tables and in the post-operative period.
- Consider using high technology and other devices in very high risk people or those who have failed with other conservative measures.

## Skin Integrity: Evidence Summary

**+** = demonstrated positive effect

**−** = demonstrated harmful effect

**±** = equivocal effect identified in the research, however recommended by expert opinion

| SKIN INTEGRITY | | | |
|---|---|---|---|
| | **Goals of management** | | |
| **INTERVENTIONS** | **Reduce excessive pressure** | **Maintain mobility** | **Maintain nutrition** |
| **General skin care measures** | | | |
| *Daily skin inspection* | ± | | |
| **Expert opinion:** Individuals at risk of developing pressure ulcers should have a comprehensive skin inspection at least daily for signs of impaired skin integrity (99). | | | |
| *Skin hygiene* | ± | | |
| **Expert opinion:** The skin should be kept clean and free from all potentially irritating substances and those that substantially alters skin pH. Dry flaky skin should be treated with a topical moisturiser. Avoid high skin temperatures by avoiding skin contact with plastic surfaces covering mattresses and pillows and ensure turning schedules do not exceed two hours for people on basic mattresses (99). | | | |
| *Nutrition* | | | + |
| **Level II evidence:** Maintain adequate nutrition. Nutritional supplementation should be considered where nutritional deficits compromise skin integrity. A systematic review by Langer et al. (2004) identified one study (Bourdel 2000) which was sufficiently large and methodologically rigorous to demonstrate that nutritional supplements reduced the number of new pressure ulcers (100). Where appropriate, refer to a dietitian. | | | |
| *Mobilisation and activity* | | + | |
| **Level III-2 evidence:** A prospective cohort study of hospitalised patients older than 55 years of age demonstrated that immobilised patients had a greater risk of developing a pressure ulcer (101, 102). | | | |
| *Management of continence* | ± | | |
| **Expert opinion:** Avoid skin contact with urine or faeces and employ interventions to promote continence, such as continence training or continence aids (99). | | | |
| **Mechanical loading and support surface measures** | | | |
| *Positioning* | ± | | |
| **Expert opinion:** The most frequently recommended turning schedule is two hourly. Skin inspection with each turn is recommended to determine whether more frequent turning is required (99). | | | |

| SKIN INTEGRITY | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Reduce excessive pressure | Maintain mobility | Maintain nutrition |
| *Sitting* | ± | | |
| **Expert opinion:** Avoid prolonged uninterrupted sitting in a chair or wheelchair. Repositioning or shifting of pressure points should occur as frequently as every 15 minutes to hourly depending on the tissue tolerance to pressure (99). Even with appropriate pressure relief, it might be necessary to restrict sitting time to less than two hours in people at elevated risk of skin breakdown (103). | | | |
| *Massage* | – | | |
| **Expert opinion:** There is no evidence to support the practice of massaging over bony prominences and there is the suggestion that in at-risk individuals massage might lead to deeper tissue trauma through the forces of friction and shear. | | | |
| *Reduce heel pressure* | ± | | |
| **Expert opinion:** Care should be aimed at providing total relief of pressure from the heels in individuals at risk of skin breakdown. Pillows or foam under the full length of the lower leg will assist in relieving pressure from the heels (99). | | | |
| *Air filled vinyl boots with a foot cradle* | – | | |
| **Level II evidence:** One randomised controlled trial found that air filled vinyl boots with a cradle were associated with more rapid development of pressure sores than were hospital pillows (256-258) | | | |
| *Foam mattresses* | + | | |
| **Level I evidence:** A meta analysis found that foam mattresses (high specification) reduce the incidence of pressure areas over the period of ten to 14 days compared with standard mattresses (256, 259). | | | |
| *Pressure relieving overlays* | + | | |
| Level I evidence: One systematic review has found that using pressure relieving overlays (constant low pressure device) on operating tables and in the post-operative period reduces the incidence of pressure sores. However, it is unclear which form of pressure relief is most effective: intra-operative or post-operative (256). | | | |
| *Medical sheepskin overlays* | + | | |
| **Level II evidence:** One randomised controlled trial found that sheep skins reduce the incidence of pressure sores after orthopaedic surgery for people older than 60 years of age (256). | | | |
| *Alternating pressure devices* | ± | | |
| **Level I evidence:** The effects of alternating pressure devices on pressure ulcer prevention are unclear (256). These devices are suitable for moderate to high risk individuals (260). | | | |

| SKIN INTEGRITY | | | |
|---|---|---|---|
| | Goals of management | | |
| INTERVENTIONS | Reduce excessive pressure | Maintain mobility | Maintain nutrition |
| *Low air loss beds* | + | | |
| **Level II evidence:** One randomised controlled trial identified that low air loss beds reduced the incidence of pressure sores (compared with standard beds) in intensive care (256, 259) for moderate to high risk patients (99). | | | |
| *High air loss/air fluidised devices* | ± | | |
| **Level I evidence:** The effects of high air loss/air fluidised devices on pressure ulcer prevention are unclear (256). These devices are suitable for moderate to high risk individuals (260). | | | |
| *Turning beds* | ± | | |
| **Level I evidence:** Studies have not demonstrated that turning beds have any benefit in reducing pressure ulcers (99, 260). | | | |
| *High tech devices versus low tech devices* | ± | ± | |
| **Level I evidence:** The relative merits of alternating pressure and constant low pressure devices and of the different alternating pressure devices for pressure ulcer prevention are unclear (261). There is little evidence on the clinical effectiveness or cost-effectiveness of comparing high specification foam mattresses/overlays and high tech mattresses/overlays; however, high tech devices are significantly more expensive (256, 259, 261). | | | |

# Skin Integrity

## 6.1 Aim

To maintain skin integrity in the older person across the acute, sub-acute and residential care sectors

## 6.2 Pressure areas

Many terms are used to describe skin breakdown, including pressure areas, pressure sores, pressure ulcers, bedsores, ischaemic ulcers and decubitus ulcers. All of these terms refer to 'a lesion caused by unrelieved pressure resulting in the damage of underlying tissue' (99, 262).

Pressure areas occur when the soft tissue is compressed between bony prominences and an external surface for a long time (99). The soft tissues can be the epidermis, dermis, subcutaneous fat and muscle. They are commonly found below the waist and at bony prominences, such as the sacrum, hip and heels (256). The critical determinants of skin breakdown are the intensity and duration of pressure, and the tolerance of the skin and its supporting structures to pressure (99). Figure 3 outlines the factors that can contribute to pressure ulcer development.

The intensity and duration of pressure relates to factors that impede mobility, activity and sensory perception. The tolerance of skin and its supporting structures to pressure relates to intrinsic and extrinsic factors (99). Intrinsic factors include immobility and reduced activity, sensory loss, particularly with spinal cord injury, impaired cognitive state and altered consciousness, age, and circulation (99). Extrinsic factors include shearing and friction forces and excessive moisture, particularly from urinary incontinence. Faecal incontinence increases skin exposure to bacteria and therefore enhances the potential for pressure ulcers (99).

## 6.3 Extent of the problem

Skin breakdown occurs in patients and residents in all sectors of the health industry. The baseline prevalence of pressure ulcers reported in an Australian national study of pressure ulcers (2000) was 26.5 per cent (range of 13–37 per cent) (263, 264). The incidence of pressure ulcers in Australia ranges from 5.4–11 per cent (263). A more recent Victorian State Pressure Ulcer Point Prevalence Study (PUPPS 1) (VQC 2004) reported similar results (265). In the Victorian study, 67.6 per cent of pressure ulcers were acquired in hospital (265). Within this cohort, immobility was demonstrated as the most important associated risk factor (265).

Apart from incidence and prevalence of pressure ulcers, consequences of morbidity, mortality, quality of life and costs need to be considered. For the period 1997–2000, the Australian Bureau of Statistics recorded that 1,293 people had died with pressure ulcers identified as either the primary or secondary cause of death (263, 265). In 1999, pressure ulcer morbidity was estimated to affect 60,000 people a year (266). In 1997, the Federal Minister for Health reported pressure ulcers cost $350 million a year (263, 265).

## Figure 3: Factors related to pressure ulcer development

This figure is based on Braden and Bergstrom's conceptual schema for the study of the aetiology of pressure ulcers (267). (Modified from Australian Wound Management Association (2003 (99)).
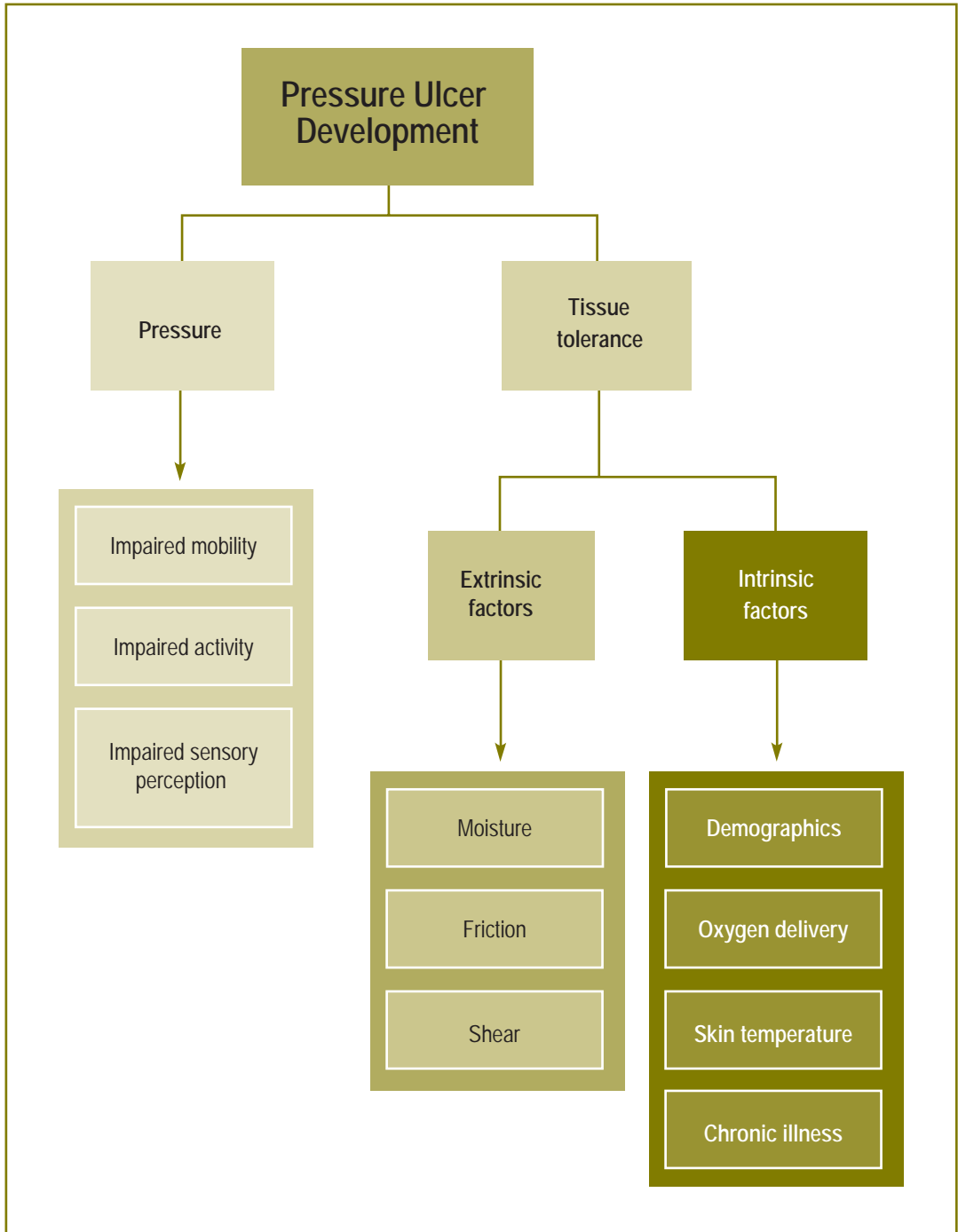
Maintaining skin integrity is important because pressure areas are associated with increased hospital costs and longer lengths of stay (265). When skin breakdown occurs, there is an associated two- to four-fold increase of death in older people and people in intensive care (256). Often pressure areas are a marker for underlying disease severity and other co-morbidities rather than an independent predictor of mortality (256). It has been noted that the majority of pressure ulcers occur in the first two weeks after admission to a facility (268). These results support the need to identify those patients at risk for developing pressure areas early in their episode of care, preferably on admission.

## 6.4 How can pressure areas be prevented or minimised?

The prevention of pressure ulcers involves a number of strategies designed to address extrinsic factors, such as reducing the pressure duration or magnitude at the skin surface by repositioning or using pressure relieving cushions or mattresses, and intrinsic factors, such as helping the patient's skin to remain intact and resist pressure damage by optimising hydration, circulation and nutrition (100). Health services that deal effectively with pressure ulcer prevention and management employ a broad range of strategies, including executive leadership, multidisciplinary input, wound management staff and a commitment to resourcing, education and pressure reducing equipment (265). Internationally, pressure ulcer prevention strategies have been shown to reduce incidence by up to 30 per cent (269, 270). An Australian study has highlighted the need for guideline implementation to be linked to educational strategies for successful implementation and longevity (271).

All risk factors and potential causes of pressure areas identified through the comprehensive risk assessment process should be addressed where possible. The aim of the risk assessment process is to inform the implementation of preventive strategies, which might include some of the following.

### Consider general skin care measures

#### Daily skin inspection

Skin assessment is fundamental to the early identification of skin damage and provides a baseline for planning interventions (99). People at risk of developing a pressure ulcer should have a comprehensive skin inspection for signs of impaired skin integrity at least daily (262, 272). This assessment should pay particular attention to skin overlying bony prominences, for example, the sacral area, the heels and greater trochanters.

### Skin health care

#### Hygiene

The skin should be kept clean and free from all potentially irritating substances and those that substantially alter skin pH. Alkaline soaps should be avoided and all skin care products should be evaluated for their pH value and dermatological safety (99).

#### Skin moisture maintenance

Skin should be kept dry, but should also be monitored for excessive dryness. Dryness and reduced tissue turgor diminish the tissue's resistance to mechanical forces such as pressure, shear and friction. Dry flaky skin should be treated with a topical moisturiser (99).

*Maintenance of stable skin temperature*

Overheating of the skin predisposes an individual to a greater risk of developing pressure ulcers (273). The skin should avoid contact with surfaces that interfere with conduction and convection of heat, such as plastic surfaces covering mattresses and pillows (99). Increasing the length of time between turning intervals can also increase skin surface temperature. Scheduled turning intervals should not exceed two hours, however, they should be tailored to the individual's tissue tolerances (273).

## Consider adequate nutrition

There is some evidence that malnutrition is positively correlated with pressure ulcer incidence and severity (268). A systematic review by Langer et al. (2004) reviewed four randomised controlled trials investigating the role of nutritional supplements in preventing pressure ulcers. The review identified one randomised controlled trial of 672 patients aged 65 years and older which was sufficiently large and methodologically rigorous to demonstrate that nutritional supplements reduced the number of new pressure ulcers. The intervention group received two oral mixed nutritional supplements a day in addition to usual care, which included a pressure ulcer prevention program (changing positions, special mattresses and cleaning care) (100).

Nutritional supplementation should be considered where nutritional deficits compromise skin integrity. Where appropriate, refer to a dietitian. See the nutrition section of these guidelines for recommendations for preventing malnutrition.

## Consider mobility and activity

Immobility is reported to be the most important risk factor associated with pressure ulcer development (265, 274, 275).

Mobilisation and activity alter pressure on weight bearing areas, relieving stressed or damaged tissue of pressure, and improve circulation. Patients/residents should be encouraged to maximise activity and mobilisation consistent with their medical condition, ability and energy level. In the acute setting, particular attention should be paid to early mobilisation following surgery, stroke or major illness. The multidisciplinary team should assess the need for devices that assist people with activity and mobilisation, for example, trapeze, walking stick, walking frame or hand rails (275). Refer to the section on mobility and self-care in these guidelines for recommendations for preventing reduced mobility and falls. Refer to a physiotherapist if specialist assistance is required with mobilisation (99).

## Consider management of continence

Exposure of the skin to bodily fluids should be avoided or minimised. Skin coming in contact with urine and faeces can increase the risk of maceration and provide a favourable environment for bacterial growth. Measures should be employed to promote continence, such as continence training, regular toileting, continence pads, and protective bed or chair sheets that provide a quick drying surface to the skin. Refer to the section on continence in these guidelines for recommendations for preventing incontinence. Protective plastic bed surfaces can prolong exposure to moisture and should be avoided where possible (99).

### Consider mechanical loading and support surface measures

*Positioning*

There is little evidence to demonstrate the optimal frequency of manual repositioning. The most frequently recommended turning schedule is two hourly, however, individual tissue tolerances should determine the schedule. Skin inspection with each turn is recommended to determine whether more frequent turning is required (99).

*Sitting*

Managing the patient's or resident's sitting position is also important. Avoid prolonged uninterrupted sitting in a chair or wheelchair. Repositioning or shifting of pressure points should occur as frequently as every 15 minutes to hourly depending on the tissue tolerance to pressure (99). Even with appropriate pressure relief, it might be necessary to restrict sitting time to less than two hours in people with an elevated risk of skin breakdown (103, 261). Where possible, sitting time can be interrupted by time spent standing and walking, which also facilitates circulation.

*Massage*

Traditionally, it was thought that massage over bony prominences would increase blood flow to the affected area, increasing tissue oxygenation and nutrition. There is no established scientific evidence to support this practice and there is the suggestion that in at-risk individuals massage might lead to deeper tissue trauma through the forces of friction and shear (99).

*Reducing heel pressure*

Heels are particularly vulnerable to pressure. Care should be aimed at providing total relief of pressure from the heels in individuals at risk of skin breakdown. Pillows or foam under the full length of the lower leg will help to relieve pressure from the heels (99).

One randomised controlled trial found that air filled vinyl boots with a cradle were associated with more rapid development of pressure sores compared than were hospital pillows (256, 257).

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**People undergoing surgery – acute care**

Use either high specification foam theatre mattress or other pressure relieving surface on operating tables and in the post-operative period for vulnerable patient groups identified during risk screening (Level I evidence) (256, 259).

Use medical sheepskin overlays following orthopaedic surgery (Level II evidence) (256).

Use low air loss beds in intensive care units rather than standard mattresses for moderate to high risk patients (as determined by risk screening tool) (Level II evidence) (99, 256, 259).

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*Pressure relieving devices*

Support surfaces should be used in conjunction with a comprehensive prevention strategy based on frequent observation and assessment, individualised turning regimen and measures to increase the tissue tolerance to pressure (99). Support surfaces can be categorised according to a number of criteria, some of which relate directly to their effect on the patient, and others, which relate to their physical characteristics. A glossary of these terms is provided at the end of this section.

*Low tech devices/constant low pressure supports*

Low tech devices provide a conforming support surface which distributes the body weight over a large surface area (261). They tend to distribute pressure in a constant and static manner.

*Mattresses*

Basic hospital mattresses, emergency department trolleys, and radiology and operating room tables offer very little in the way of pressure relief. These basic mattresses usually comprise a single piece of five centimetre polyurethane foam confined by a non-stretch plastic or nylon cover (99). 'Core fatigue' or softening of the mattress where maximal weight is distributed often occurs, resulting in the patient lying directly on the bed base. There are a number of devices that optimise the surfaces patients lie on. These devices, along with regular assessment of the mattress, should be used to minimise the development of pressure areas.

Foam pressure reducing mattresses have ten centimetre thick foam overlays and have demonstrated pressure reducing capabilities compared with the basic hospital mattresses. These ten centimetre mattresses are better suited to those people at low to moderate risk of developing pressure ulcers (276).

Static air mattresses and overlays are designed with interconnected chambers, which allow air exchange between compartments when compressed. Studies have repeatedly demonstrated that these are superior to standard hospital mattresses when appropriately inflated (276).

These types of pressure relieving mattresses should replace standard hospital mattresses for patients who are assessed as being at high risk of developing a pressure ulcer (259, 260).

*Sheepskins, fibre filled overlays and gel pads*

Sheepskins, fibre filled overlays and gel pads are other forms of pressure reducing static devices, which cover existing mattresses. They are available with a wide range of accessories, such as heel and elbow protectors.

A natural fleece sheepskin is considered a comfort measure which can potentially reduce friction and vapour loss (277). Gel filled pads or dry visco-elastic polymer-flotation pads have been reported to be effective in protecting the sacral area and to work well for overweight people (278, 279). These pads are frequently used on operating tables as overlays for protecting the head, heels or ankles. Fibre filled overlays consist of synthetic fibres within a series of connected cushions and can be useful in minimising friction and shearing forces (99).

### High tech devices/alternating pressure supports

High tech devices and alternating pressure supports are dynamic systems (261). The most effective pressure relieving support surface, such as a sophisticated alternating pressure device, should be used for those individuals who are unable to tolerate a turning regimen or in cases where a consistent turning regimen (24 hours a day) cannot be guaranteed (99).

### Alternating pressure devices

Alternating pressure devices are available as overlays for beds and chairs or as a replacement for mattresses. They work on the principle of cyclic inflation and deflation of air cells over a short period of time. The continual alternation of inflation and deflation temporarily changes the interface pressures, thus relieving sections of the body from pressure (276). These devices are suitable for moderate to high risk individuals (260).

### Low air loss devices

Low air loss devices provide a continual flow of air throughout the entire surface of the mattress (99). They are available as an overlay and a replacement mattress suitable for moderate to high risk patients/residents. A speciality bed caters for the high risk individual (280).

### High air loss or air fluidised devices

High air loss or air fluidised beds are designed for the high risk patient/resident who cannot tolerate any pressure; however, these are costly devices and their flotation properties can make handling the patient/resident difficult (99).

### Turning beds

A variety of beds and devices constitute turning beds. They are controlled by mechanical or manual means and provide continuous or intermittent movement (279).

Although there is no research evidence to suggest that high tech devices are more effective than low tech devices, alternating pressure devices should be considered as a first-line prevention strategy for people at elevated risk following an holistic assessment, for cases where an individual's previous history indicates they are best cared for by such a device, and when a low tech device has failed (261).

## Glossary of terms for skin integrity

### Air fluidised supports

Membranes that cover a layer of particles and fluidised by having air forced through them. The airflow can be turned off, which makes the surface solid again to allow the person to be moved. People find it difficult to get in and out of these beds independently, therefore, they are usually reserved for those people who spend most of their day in bed.

### Alternating pressure surfaces

Mattresses or overlays made of one or two layers of parallel air sacs. Alternate air sacs are inflated and deflated which provides alternating pressure and release for each area of skin.

### Blanching erythema

The skin whitening that occurs when pressure is applied indicating that microcirculation is intact.

### High tech devices

Dynamic pressure relieving devices, which include alternating pressure devices, air fluidised and low air loss devices and turning bed or frames (kinetic or profiling beds).

### Low air loss beds

Mattresses comprising inflatable upright sacs of semi-permeable fabric. Inflation of these sacs increases the area of contact between the individual and the support surface and reduces the pressure on the skin. People find it difficult to get in and out of these beds independently, therefore, they are usually reserved for those people who spend most of their day in bed.

### Low air loss hydrotherapy beds

A mattress comprising cushions covered by a permeable, fast drying filter sheet through which air is circulated. The bed also contains a urine-collecting device.

### Low tech devices

A conforming support surface that distributes body weight over a large surface area. Low-tech devices include standard foam mattresses, alternative foam mattresses or overlays (high specification foam, visco-elastic, convoluted foam, cubed foam), and mattresses or overlays that are filled with gel, fluid, fibre or air.

### Low or high tech cnstant low pressure supports

Mattresses, overlays and cushions made of high density or contoured foam or filled with fibre, gel, water, beads or air. They increase the area of contact between the person and the support surface and thus reduce the pressure at the interface. See also air fluidised beds, low air loss beds and low air loss hydrotherapy beds.

### Overlay

A term used to describe surfaces that are placed on top of a standard mattress or operating table.

### Turning bed

Motor-driven turning and tilting beds that either aid manual repositioning of the patient/resident or reposition the patient/resident.

Source: (256, 261)

# The way forward

# The way forward       *7*

## A systems approach

If guidelines are to have maximum impact, they need to form one element of an integrated quality planning and improvement strategy rather than be developed and implemented in isolation. These guidelines provide general information about preventing functional decline and managing common conditions that increase risk of further functional decline. To ensure guidelines effectiveness and to enable better health outcomes for patients/residents, implementation of these guideline recommendations for specific preventive and management interventions should be integrated with appropriate risk screening and comprehensive risk assessment processes.

Guidelines are more likely to be effective if the system within which they are implemented facilitates their use. For maximum effectiveness, the guidelines should be integrated with broader activities, such as continuing professional education, quality assurance, performance monitoring and accreditation, to promote and improve the quality of care at the local level.

## Implementation issues

The National Health and Medical Research Council has published information about implementing clinical practice guidelines (3).

## Dissemination and review

Dissemination involves making the guidelines accessible, advertising their availability and distributing them widely. The end users of the guidelines, as well as the setting within which the guideline recommendations are to be implemented, will determine the most appropriate dissemination strategy.

If the guideline recommendations are integrated into workflow practice they are more likely to be effective. Clinical pathways (in which pathway documentation forms the basis of the medical record) and electronic decision support tools that integrate decision making with other clinician useful data, such as pathology investigations, are examples of integrative tools.

These guidelines also need to be embedded into an organisational quality framework which ensures adequate access to guideline recommendations, regular review of adherence to guideline recommendations, and appropriate updating of guidelines at least every three to five years. Where recommendations are likely to require significant behavioural change, it is important to assess organisational change capacity. There is insufficient evidence about which implementation strategies are most effective; however, the success of any implementation process depends on an organisation's capacity and readiness for change. For sustained effectiveness, ongoing training, orientation and upskilling of staff involved in implementing the guideline recommendations must be considered.

These guidelines do not specifically address the financial implications of their recommendations' full implementation; however, many of the recommendations require small changes in staff practice, which can be implemented without substantial resource allocation.

## Evaluation

Planning the guideline evaluation methods should begin during the implementation planning phase. For sustained effectiveness, an evaluation plan should include assessment of structure (relationship of guidelines to organisational quality framework and management processes), process (dissemination and implementation strategy review, review of integrative tools) and outcomes (including patient health, patient and staff satisfaction, and health care use and cost outcomes).

Ideally, the effectiveness of guideline recommendations would be assessed within the framework of a randomised controlled trial. This might be difficult unless there are adequate resources to fund a cluster randomised multicentre study. An alternative is to evaluate within a 'before and after' study design. This is the least costly and most commonly used evaluation design, but it has limited ability to attribute change or lack of change to the intervention itself rather than to other organisational changes that are occurring concurrently or simply to the effect of time on knowledge uptake and practice change. It does, however, allow assessment of adherence to recommendations (for which predetermined targets, preferably based on Australian data, can be set). If comparisons are to be made between institutions, it is important that such data are appropriately risk adjusted for patient/resident case mix.

An alternative evaluation approach is to use available key quality indicators, such as those the Aged Care of the Vulnerable Elder Group(281)  use to assess clinical performance in quality care of older people and to perform regular audits of these indicators. Risk adjustment of clinical indicator data is also mandatory if comparisons between organisations are to be considered.

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## PUBLISHED GUIDELINES THAT HAVE BEEN DRAWN ON EXTENSIVELY IN THE DEVELOPMENT OF THIS DOCUMENT

- Australian Wound Management Association 2003, *Clinical practice guidelines for the prediction and prevention of pressure ulcers*, AWMA, Perth.
- Victorian Quality Council 2004, *Minimising the risk of falls and fall related injuries: guidelines for the acute, sub-acute and residential care settings*, Department of Human Services, Melbourne.