

Chapter 4:

Falls in the Elderly in Inpatient Settings

4.1. Introduction

A report by NSW Health on Fall Injury Indicators noted that a population trend indicated a change in population demographics for older people in the South Western Sydney region. A gradual rise in bed day demand for fall-related injury to the 75 years and older age group (18,304 to 29,488 bed days) between 2001 and 2016, and a smaller rise in bed day demand for those aged between 60 and 74 years (6,751 to 11,491 bed days), in the same time frame is predicted (21). These statistics do not include those people who fall during their inpatient stay.

Patient falls are associated with significant morbidity and mortality (83, 84). The incidence of falls in hospital and aged care facilities is 3 times the rate of falls in community dwelling elderly (27). The rate of patient falls in an acute hospital is therefore becoming a major concern. Over 40 percent of patients with specific clinical problems are reported to experience one or more falls during their hospitalisation (85). In Australian hospitals, according to an analysis of the Australian Incident Monitoring System (AIMS) data, Rigby et al identified that 38% of all patient incidents involve a fall (86). Costs to the health system have not been quantified, as they are generally absorbed into the day-to-day operational costs.

A fall can result in a spiral of decline resulting in prolonged and complicated admissions. The potential of poor long-term outcomes resulting from falls will become an increasing problem, in particular as the population ages. Apart from the financial cost to the health care facility, falls in hospital settings may have a devastating impact on an elderly person's physical, psychological and social status, increasing the risk of institutionalisation considerably (46, 87, 88).

Falls account for a considerable proportion of injuries to hospitalised patients (84, 89). The majority of falls in hospitals result in no injury or soft tissue injury only (84). Falls resulting in significant injury are more likely to occur in people displaying at 'risk' behaviour or who have severe illness. Generally, falls incident reporting does not measure the loss of confidence and other serious psychological effects that ensue as a result of any fall. Some studies have identified additional concerns such as increased risk of complications, added diagnostic and surgical procedures as well as potential litigation. Bates et al found a 71% increase in length of stay for patients who fall. These problems can substantially increase the cost of health care (46).

In spite of this, the implementation of a specific inpatient falls prevention program and its sustainability has not adequately been evaluated in randomised controlled trials. Hill et al. report that there are no studies evaluating the factors that optimise sustainability of changes nor the relative cost effectiveness of the various falls prevention approaches (46).

There have been, however, many observational and cohort studies undertaken on falls in hospitals. The quality of the research methodology has generally not been rigorous enough to classify most of the findings as anything other than level III or IV evidence. The National Injury Prevention Advisory Council identified that well designed and conducted trials of the acceptability and effectiveness of promising strategies in institutional settings need to be developed for different types of settings including hospitals (90). Until such evidence becomes available, these Clinical Practice Guidelines are mostly based on level IV evidence.

4.2. Risk Factors for Falls in Inpatients

Risk factors for inpatient falls are similar to those in any setting, but the following factors specific to hospital settings have been identified in an attempt to discern appropriate implementation strategies for falls prevention.

Table 3. Intrinsic Risk Factors Adapted from (46, 80)

<ul style="list-style-type: none"> • Any acute or subacute medical illness • Age >65 years (80, 91) • Diagnostic groups (patients with circulatory-system disorders were the most likely to fall (80), followed by nervous-system, respiratory, musculo-skeletal and digestive system disorders) (91). • Specific illnesses. Cardiac arrhythmias (91), Stroke (92), transient ischaemic attacks, Parkinson's disease, hypoglycaemia, orthostatic hypotension • Previous history of falls (80, 88) • Depression (83) • Impaired mental state (acute or premorbid), (80, 92, 93) • Delirium or Dementing illness • Incontinence, urgency or diarrhoea (80, 93) • Impaired mobility/balance/coordination (80, 93). • Sensory deficiencies, such as impaired vision (94), hearing impairment and dizziness/vertigo (83) • Psychotropic medications (with greater risk for those taking more than two medications) (80, 92) or polypharmacy. • Dehydration

Table 4. Extrinsic Risk Factors Adapted from (46, 80)

<ul style="list-style-type: none"> • Bedrest and prolonged hospitalisation (80, 93, 95) • Environmental aspects (80, 96) • Time of day and staff availability and experience. (84, 95, 96) • Activity at time of fall

Risk factors **for significant injury** due to falling include:

- Current use of anticoagulants
- Patients with osteoporosis
- Patients lacking muscle fat and subcutaneous tissue
- Patients with impaired mobility or vision

GUIDELINE

All older persons admitted to inpatient settings should be evaluated for falls risk

Level IV evidence

4.3. Risk Assessment Instruments

Assessment is a strategy used to minimise risk by identifying those patients who are at risk of falling (80). The rationale is the institution of appropriate interventions following the identification of the patient at high risk of falling. Some studies also identified an assessment of risk in specific situations and in select patients, including: on admission (73); all elderly on analgesics or sedatives (97); all confused and elderly before settling at night (97); post operative patients (98).

A study by Oliver et al., identified that a falls risk assessment tool developed in an inner city hospital was not as effective when tested in a district general hospital. The successful ability to predict precisely which patients will actually fall has remained elusive (94). Stevenson et al., determined that assessment scales, must include a specific set of risk factors that differ according to the patient population, otherwise only those people at the highest risk will be identified (93). Other studies (93, 99, 100) caution about the use of falls risk assessment as predictors of inpatient falls, and whilst decreasing inpatient falls is essential, falls risk assessment tools are of limited use in achieving this outcome. Stevenson suggests that ongoing assessment is more important than admission assessment in identifying falls risk (93).

GUIDELINE

Clinical judgement should be utilised in assessing risk of falls as no current scale has proven effective in risk assessment

Level IV evidence

4.4. History of a Fall as an Inpatient

A history of falls is a significant factor associated with increasing the likelihood of a fall during hospitalisation (101, 102). Studies have reported that between one quarter and one half of all patients who fall will experience more than one fall during their hospitalisation. This percentage has been shown to be highly variable, ranging from 16% to 52% (80). There is no rigorous research to support the proposition that the circumstances or characteristics of the initial fall are repeated in subsequent falls. This group of patients has received minimal attention from research. Gaebler found that 58% of multiple fallers repeated the type of fall and 64% repeated the location in subsequent falls (103). A history of falling during hospitalisation has been identified as a factor associated with increased risk (88). It is unclear if this risk is carried over to subsequent admissions to the hospital.

GUIDELINE

Patients who have a fall in hospital should have a post fall review. Analysis of the fall should identify those factors that are considered to be modifiable.

Level IV evidence

4.5. Adverse Outcomes Associated With Hospitalisation in the Elderly

For many older persons, hospitalisation results in functional decline despite cure or repair of the condition for which they were admitted (104, 105). Pressure sores occur frequently in hospitalised elderly patients, particularly when associated with urinary incontinence (104). Lamont (106) and Hirsch (107) studied patients 75 years or older admitted to the hospital from their home for acute illness. On discharge, most were no longer independent, and many required discharge to nursing homes. The predictors of poor hospital outcomes such as 6-month mortality, length of stay and nursing home admission include premorbid functional dependence, atypical disease presentation and functional decline at admission (108, 109). These factors are better predictors of poor outcomes than principle diagnosis or age. This dependency of illness and hospitalisation predisposes older people to falls in hospital.

Currently, length of stay in hospital is used as a benchmark for efficiency and poor hospital outcomes. A number of studies have assessed for predictors of hospital length of stay. They have shown that falls, age, admission for stroke, confusion, incontinence and loss of function predict length of stay. Other factors found to be predictive have included discharge domicile, social admission, dementia, poor health, fatal prognosis and refusal of home discharge (110-112). These high risk patients in hospital can be identified. Their geriatric syndromes can be addressed with comprehensive geriatric assessment and management.

4.6. Comprehensive Geriatric Assessment

There is a vast body of literature showing the benefits of comprehensive multidisciplinary geriatric assessment and management provided by Multidisciplinary Aged Care Services in the diagnosis and care of targeted elderly patients. Positive outcomes have included improvements in mortality rates, morbidity, length of hospital stay, nursing home placement, quality of life, medication utilisation and functional status (113). More recent studies confirmed these major benefits in the changing healthcare environment (114-117).

Rubenstein reviewed 32 studies evaluating geriatric assessment programs. He concluded that there was strong evidence that these programs were effective in improving diagnostic accuracy, functional and mental status, and in influencing placement decisions at discharge (118). Winograd reviewed the literature on inpatient geriatric consultation and reported improved patient care, decreased use of health care resources, and increased identification of new diagnoses (82). As falls are one of the targeted criteria for geriatric interventions older people at risk of falls or who have fallen should have comprehensive geriatric interventions during their inpatient stay.

GUIDELINE

Inpatients with geriatric syndromes, including falls, should undergo comprehensive multidisciplinary geriatric assessments and management.

Level 1 evidence

4.7. Specific Falls Prevention Interventions

There has been a paucity of randomised studies in the inpatient setting addressing hospital falls. Cohort studies in the inpatient setting and randomised trials in the community and residential care setting have found the following interventions to be of benefit. Multifaceted inpatient programs also resulted in substantial reduction in the number of falls incidents (119, 120).

Potential interventions include:

- Education and Workforce training
- Falls prevention policies
- Treat underlying medical conditions
- Review the effect of medication, reduce psychotropic usage
- Improve orientation and minimise confusion
- Maintain, improve and assist continence
- Reduce malnutrition and dehydration
- Improve sensory deficits (vision and hearing) and footwear
- Improve mobility under supervision
- Provide appropriate aids
- Reduce bed rest
- Improve transfers in particular bed mobility
- Minimise environmental risk
- Injury minimisation (hip protectors)

4.8. Education and Workforce Training

Few studies have focused solely on the education of patients and relatives (104, 121). These studies suggest that orientating patients to the hospital environment may decrease the risk of falls in the first few weeks of the admission. Education can include functional training, safety advice, advice about postural hypotension, and the adverse effects of bed rest. Other studies have cited the value of staff education as a component of a falls prevention programme. Hendrich et al., described staff training to increase awareness of risk factors and appropriate intervention strategies as an important component (83). Schmid targeted staff from a range of departments in the hospital to provide a more global awareness and monitoring of patients (122). The interventions included the identification of at risk patients, staff training and an individual nursing care plan. Anticipatory nursing has demonstrated efficiency in reducing falls outcomes (123, 124).

In their literature review, Hill et al, list key features of a workforce training programme:

- Strategies for an early identification of an individual's falls risk
- Recognition of single and multiple, intrinsic and extrinsic factors contributing to risk
- Ways of maintaining a low risk environment
- Close monitoring of 'at risk' patients
- Early identification of the need for involvement of the multi-disciplinary team (46)

GUIDELINE

Education and workforce training should play a role in falls prevention initiatives in hospital settings.

Level IV evidence

4.9. Falls Prevention Policy

As part of clinical governance and clinical risk management strategies, hospitals should develop falls prevention as a written policy and workforce culture. The inclusion of a risk of falling assessment as part of the admission process and as part of a regular review should be an essential part of the policy statement (Appendix H). Once 'high risk of falls' patients are identified they should have a multi-disciplinary assessment and subsequent pro-active interventions implemented. There are indications that a targeted multifactorial intervention program, with the necessary components dependent upon the specific clinical group under consideration, is the most effective way to reduce the rate of falls (80, 123). A falls prevention protocol that included the assessment of cognition and mobility, with the use of a toileting regimen for at risk patients over 70, found 53% fewer falls during shifts that complied with the protocol (125). In another study the use of a nursing assessment protocol was found to reduce falls (non significant) in a geriatric ward from 9% of patients admitted to 5.9% (126). Incident forms involving falls should be regularly reviewed and active review of the factors involved (root cause analysis) should be undertaken.

GUIDELINE

As part of their risk management strategy, hospitals should develop falls prevention as a written policy and workforce culture.

Level IV evidence

4.10. Treatment of Underlying Cause of Falls

It is important to identify the causes of falls that occur in hospital in older people. Precipitating mechanisms should be reviewed, and intrinsic and extrinsic factors clarified. Acute causes, delirium, and adverse effects of medications are more likely to be present in the hospital setting.

An accurate diagnosis of these issues linked with a multidisciplinary management plan is required to improve outcomes. Although a single risk factor or illness can result in a fall in an older person, it is more common for multiple problems to present as a geriatric syndrome such as a fall. In defining geriatric syndromes, Tinetti, et al., list falling, urinary incontinence and delirium as examples of geriatric syndromes (127). The patient population experiencing these syndromes is defined as older, particularly frail persons, and the occurrence may be triggered by acute insults such as a hospital admission, and is often linked to subsequent functional decline (128). Falling, incontinence and delirium are believed to result from the accumulated effects of impairments in multiple domains (129). The increased vulnerability resulting from impairments in multiple systems, and the loss of compensatory ability, defines frailty and explains why frail elderly persons are at particular risk of experiencing geriatric syndromes, including falls. Multifaceted geriatric interventions that include accurate diagnosis and treatment of medical illnesses in this target group are strongly linked to numerous positive outcomes. However randomised studies specifically addressing medical interventions preventing inpatient falls alone have not been performed.

GUIDELINE

All older patients with falls in hospital need to be evaluated for causes of falls in particular acute illness precipitating the fall.

Level IV evidence

4.11. Medication Review and Postural Hypotension

Polypharmacy, misuse and overuse of medications can increase the risk of falling. Drug interactions, unwanted side effects, and even the wanted effects of drugs can increase the risk. Tinetti et al., demonstrated a significant relationship between individual medications and the geriatric syndromes of falling, urinary incontinence and functional dependence. Psychotropic medications and insulin were associated with falling (127). Work by Andrews et al., looked at the incidence of falls in elderly patients and possible associations with medication use. They found that medications most likely to contribute to falls were cardiovascular (52%) psychotropic (40%) and analgesic agents (8%) (130). Verhaeverbeke and Mets looked at drug induced orthostatic hypotension in the elderly. They found the prevalence to be between 5 and 33%, and asserted that this high prevalence contributed to the risk of syncope and falls in old age (131). It is known that changes in pharmacokinetics and pharmacodynamics occur with aging in relation to many drugs, resulting in delayed elimination and increased bioavailability. This results in drugs with antihypertensive actions such as diuretics, calcium antagonists, beta-blockers, ACE inhibitors, alpha-blockers and centrally acting antihypertensives, have a more pronounced effect in the elderly. Nitrates, antiparkinsonian, antidepressant and antipsychotic drugs, all cause hypotension as an adverse effect. Another study found a high prevalence of hypotension (23%) and confusion (30%) following 245 hospital falls.

The conclusion is that orthostatic hypotension and medications should be reviewed in hospitalised patients (132). Murdock (1998) found a significant reduction in falls following implementation of a policy that included postural blood pressure measurement and medication review (133).

Many medications have been associated with falls (See Appendix E). There is substantial evidence that medication review and modification is effective in reducing falls risk in community and residential care (51, 134). There is very little evidence however that it is effective in hospital settings. In hospitalised patients however, potentially harmful medications need to be reviewed and withdrawn if possible. Doses of essential medication should be reduced to the minimum level to achieve therapeutic effect. All patients should have regular medication reviews and modification during their admission, post fall and at discharge. Changes in medication should be well documented and explanations given to the General Practitioner who will resume the care of the patient post discharge.

GUIDELINE

Medication review and modification to reduce risk of falls should occur for all older people requiring admission to hospital.

Level III-3 evidence

4.12. Delirium Reduction

Falls, dehydration and delirium are clearly linked as described in studies by Kolb (135) and Janken et al.,(89). Impaired mental status has been identified as the most common factor evident in patients who fall in hospital. A study by Bates et al., identified that a history of confusion was noted in 48% of fallers on the day of the fall (136). Delirium is a transient organic mental syndrome characterized by disturbances in consciousness, thinking and memory (137). Delirium occurs in up to 60% of older hospitalised patients, and is the most frequent hospital complication in these patients (138, 139). It has been associated with poor outcomes including increase morbidity and mortality prolonged length of stay, institutionalisation and functional decline (140).

Delirium is another of the geriatric syndromes which is believed to result from the accumulated effect of impairments in multiple domains (127). It is rarely caused by a single factor and results from the interaction of vulnerability on the part of the patient and hospital related insults, such as medications or procedures (139). In attempting to identify the patient most at risk of developing delirium, Inouye and Charpentier divided the factors into predisposing and precipitating sub groups. Predisposing factors included the use of physical restraints, malnutrition, more than three newly prescribed medications, use of urinary catheters, and any iatrogenic event (141). Precipitating factors have included infection, the use of neuroleptic and narcotic medications (142), a high number of medications administered during hospitalisation, surgery, a high number of procedures during early hospitalisation, and intensive care treatment (143).

Studies have identified that surgical older patients are at risk of developing delirium, and thus increase their risk of falls. Marcantonio et al., identified preoperative delirium risk factors in elective non-cardiac surgery including age, alcohol abuse, poor cognitive status, poor functional status and markedly abnormal serum sodium, potassium or glucose levels (144). In 1998, they also identified the association of intraoperative factors with the development of postoperative delirium. Such factors included intraoperative blood loss, postoperative blood transfusions and lower postoperative haematocrit. Evidence exists to support identified precipitating factors for postoperative delirium including; prolonged waiting time for surgery (145), lack of postoperative mobility (146), and pain and problems in pain management (146, 147). The definition, diagnostic criteria and one mode of assessment for delirium are outlined in Appendix F.

Unfortunately delirium often escapes detection, or is misdiagnosed due to a lack of knowledge and awareness in nurses and doctors (137, 138). Rapport et al., found that patients with motor and sensory impairments whose judgment is intact, are less likely to initiate behaviour that risks their safety, whereas patients with executive functioning impairment are more likely to engage in impulsive risk taking behaviour which puts them at a higher risk for accidents including falls (148). The inability to understand and impaired memory were also found to be significant factors that increase the patient's risk of falling (149).

Once delirium is established, a comprehensive general examination and mental status examination is required. Routine laboratory and radiology tests should be directed at the common metabolic and infectious disorders that precipitate delirium. Treatment is directed at the underlying acute illness (150). Management includes identifying and treating all precipitants and predisposing factors. Recommended interventions also include educating staff and relatives, providing appropriate fluid and electrolytes, discontinuing any unnecessary drugs, allaying the patients' fear and agitation and limiting the use of physical restraints. Supportive therapy could include close monitoring, involvement of families, avoiding extremes of sensory input, minimising catheters or intravenous lines, use of low beds, and reorientation, as well as prevention of complications such as malnutrition and sepsis. A study by Inouye, et al., identified that a multicomponent targeted intervention strategy (including orientation and stimulating activities, early mobilisation, visual and hearing aids, dehydration protocol, and non pharmacological sleep enhancement) was effective for the prevention of delirium in hospitalised older medical patients (139). Multicomponent intervention to prevent delirium may provide an effective strategy for reducing falls in elderly medical patients.

GUIDELINE

Delirium prevention programs should be implemented in targeted medical and surgical patients in acute hospitals

Level II evidence

4.13. Maintain, Improve and Assist Continence

Incontinence, urgency or diarrhoea may increase a patient's risk of falling (93). Rapid correction of reversible problems and improved access to toilets should minimise risks. A study by Bakarich et al., in an acute hospital setting assessed 2,023 patients for falls risk. Of the 24% of patients assessed as at risk of falling, those who were toileted regularly had considerably less falls than those patients who were not toileted. Difficulty in compliance with regular toileting in this study may have been due to staffing shortages (125).

GUIDELINE

Improved continence and regular toileting regimes should reduce risk of falls

Level III-3 evidence

4.14. Reduce Malnutrition and Dehydration

There are no randomised control trials found which have looked at the effectiveness of nutrition management on reducing falls or injury rates in hospital settings (46). Covinsky et al., showed that 16% of patients were severely malnourished on admission. Poor outcomes post hospitalisation, such as death within one year, delayed functional recovery, and higher rates of nursing home placement have been found in this group (151). Thomas et al., found that over 91% of patients admitted from sub-acute to acute care were either malnourished or at risk of malnutrition (152). They identified that more than half had low serum albumin, which is a consistent predictor of mortality and morbidity (153). Length of stay was increased by 11 days in the malnourished group. Readmission to an acute care hospital occurred more than twice as much in the malnourished as in the well-nourished group, 25% to 11% respectively.

Adequate nutrition is a critical factor in reducing falls rates (46). It assists in recovery from an acute illness and allows participation in therapy programs by improving energy levels for older people. It is essential for wound healing, reducing infections, and for improving bowel and bladder function. Vitamin, nutrient and mineral deficiency lead to muscle weakness and muscle tremor, macular degeneration and visual problems, anaemia, lethargy and weakness, mental confusion and cognitive impairment. In particular, Vitamin D levels are found to be significantly decreased in over 50% of older people admitted to hospital for medical reason. All of these conditions have been associated with higher risk of falls. Elderly patients should be reviewed by dieticians and/or speech pathologists to identify nutritional, swallowing and/or eating problems early in their admission.

Elderly patients are also at high risk of dehydration in hospital environments. Impaired thirst, delirium, pain, constipation, and intravascular volume depletion following bed rest, contribute to postural hypotension and falls. A proactive nursing intervention, including reviews of patients at four peak times for fluids/food/toileting and transfers, was found to produce a reduction in falls compared to pre-intervention years (124).

GUIDELINE

Nutritional and hydration assessment should be performed on elderly patients admitted to hospital. Appropriate referral to a dietician and/or speech pathologist should be made early in their admission.

Level IV evidence

4.15. Improve Sensory Input and Footwear

Poor vision has been targeted in multifaceted community falls prevention programs (9, 154). Both vision and hearing impairment may contribute to delirium and falls. Inappropriate footwear has been found to be associated with falls in the community setting. The use of treaded slipper socks significantly reduced the incidence of falls related to slipping in urine in one study (155).

GUIDELINE

Sensory impairments, foot pathology and footwear need to be reviewed incorporated in multifaceted inpatient falls prevention programs

Level IV evidence

4.16. Improve Mobility, Transfers and Reduce Bed Rest.

Risk factors for falls include decreased mobility, decreased strength, poor balance, poor coordination, ataxia and reduced bone density (93). Prolonged bed rest and inactivity results in a spiral of changes. The complications of muscle weakness, muscle wasting, poor balance, loss of endurance, loss of confidence, reduced bone mineral density, cognitive impairment, nutritional deficiency and urinary incontinence (104), subsequently increase the risk of falling (156). Creditor also demonstrated that disuse of muscles because of bed rest or chair rest leads to a loss of muscle mass of <1.5%/day in adults (104).

Lazarus, in assessing the physical activity of 500 elderly patients on acute medical and surgical wards during the first seven days of hospitalisation, found that poorly differentiated staff roles, unclear communication, lack of established policies and procedures, and other operational factors, may affect the provision of activity during hospital settings (157). Lack of documentation of functional status has also been described in a study by (158).

The outcome of immobilisation or bed rest includes deterioration in function and mobility (107). Similar deterioration was seen for transferring, toileting, feeding and hygiene needs. Hirsch et al, 1990, also reported that 70% of patients who were dependent in ambulation at discharge from acute and tertiary hospitals, had been completely independent in ambulation two weeks prior to the hospital admission. Older people are therefore in a transitional phase of functional change during the time of their acute illness (107). Mitchell and Jones reported a trend in falls reduction with the implementation of a mobility program. Supervised mobilisation, increasing exercise capacity, increasing daytime activities out of bed, use of appropriate aids and transfer

training as part of multifaceted geriatric interventions, can reduce this dependency as outlined in multiple positive studies in inpatient settings (96).

GUIDELINE

Bed rest should be minimised for all older in-patients. Early mobilisation and transfer training should be incorporated in geriatric interventions for older inpatients.

Level I evidence

4.17. Environmental Factors and Modification

Inpatient falls are a significant problem for institutions providing care to the elderly. The majority (up to 50%) of these falls occur in the patient's bed area with the corridor, bathroom and toilet being other frequent locations for inpatient falls (80). Hanger et al (1999) reported that 80% of falls occurred around the bedside in a rehabilitation hospital setting (159). A year-long study at Liverpool Health Service on two homogeneous acute medical wards also demonstrated that falls beside the bed accounted for 33% of the single falls and 36% of the multiple falls.

Although there is no level I and II evidence to indicate that environmental factors play a significant role in falls in an inpatient setting, a hazardous environment has been identified as a major extrinsic risk factor for inpatient falls in a number of retrospective studies (46). Environmental factors such as unstable furniture, inadequate lighting, poorly fitting shoes (91), improper use of bedrails and physical restraints (160), slippery floors and cluttered areas (161) were documented as contributing to falls in an inpatient setting. Removing cannulas, catheters and physical deterrents as soon as possible, as well as improving bed/chairs and access to toilet facilities, can also reduce risks. Restraints do not reduce the incidence of falls and may increase poor outcomes(162). One study was able to show a significant reduction in the use of beds rails following the introduction of a policy with no increase in the number of falls (159). The use of bed exit alarms has also been reported to reduce falls in non controlled studies (163-165). Tideiksaar in a small randomised study found no benefit from a bed alarm system (166).

GUIDELINE

Environmental modifications to a ward hospital area should be included in multifaceted inpatient falls prevention interventions

Level IV evidence

4.18. Injury Minimisation

Hip protectors have been found to be effective in aged care facilities. Their use should be considered for high-risk patients as part of a multifaceted approach to reduce falls.

GUIDELINE

Hip protectors should be considered for inpatients at high risk of falls

Level IV evidence