



# Best Practice

Evidence Based Practice Information Sheets for Health Professionals

## Falls In Hospitals

### Purpose

The purpose of this practice information sheet is to provide summarised best available evidence on patient falls in hospitals. This information sheet covers factors that increase the risk of falling, assessment of risk of falling, and interventions aimed at minimising the risk of falling. This information sheet is based on a systematic review undertaken by The Joanna Briggs Institute.

### Introduction

It has been estimated that one third of people aged over 65 years, and half of people over 80 years, suffer at least one fall per year. In Australian hospitals, 38% of all patient incidents involve a fall. This high incidence of falls has been attributed to many factors including trauma, debilitating disease, environmental hazards, age, mental status, length of hospital stay and gender. While there has been a large number of studies conducted and many papers published, patient falls continue to be a major problem for hospitals.

### Quality of Research

In undertaking this systematic review of falls research a number of issues

### This Practice Information Sheet Covers The Following Concepts:

1. Quality Of Research
2. At Risk Patients
3. Where And When Patients Fall
4. Assessing Patients For Risk Of Falling
5. Fall Prevention Interventions

related to the quality of research were identified. Some research reports provided inadequate information regarding the methods used during the research, which made assessment of their quality difficult. Other reports provided only minimal information about the results, limiting

### Levels of Evidence

All studies were categorised according to the strength of the evidence based on the following classification system.

- **Level I**  
Evidence obtained from a systematic review of all relevant randomised controlled trials.
- **Level II**  
Evidence obtained from at least one properly designed randomised controlled trial.
- **Level III.1**  
Evidence obtained from well designed controlled trials without randomisation.
- **Level III.2**  
Evidence obtained from well designed cohort or case control analytic studies preferably from more than one centre or research group.
- **Level III.3**  
Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments.
- **Level IV**  
Opinion of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

the usefulness of the research findings. Rigorous research methods were rarely used for falls research and as a result potential biases and errors threaten their findings. Therefore because of these limitations, much of the information in this summary of the research has been classified as level IV evidence (expert opinion).

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## At Risk Patients

While it could be argued that all patients are at some degree of risk of falling during their hospitalisation, some patient characteristics have been identified as being associated with a higher risk of falling. These include; age, mental status, a history of falling, medications, impaired mobility and special toileting needs. This evidence has been classified as level III.

- Some studies suggest that the elderly (over 65) are at increased risk of falling, but results are contradictory as other studies have suggested that the patient's age is not a factor.

- Impaired mental status was the most commonly identified factor in patients who fell while in hospital. This impairment has been described as confusion or disorientation, but impaired memory and inability to understand may also increase a patient's risk of falling.

- A history of falling during hospitalisation has been identified as a factor associated with increased risk. Studies have reported that between 16% and 52% of patients may experience more than one fall during their hospitalisation. There is also some suggestion that patients may repeat the circumstance or characteristics of the first fall in subsequent falls, but this has not been supported by rigorous research. It appears that this group of patients, who fall on more than one occasion, may account for a considerable proportion of the total number of falls.

- Medications that act on a patient's central nervous system, such as sedatives and tranquillisers, may increase their risk of falling. While small descriptive studies have identified medications such as digoxin, anti-seizure drugs, diuretics, hypotensives and beta blockers as increasing a patient's risk, this has not been supported in more rigorous research.

- Physical factors such as weakness,

impaired mobility or poor coordination are associated with a greater risk of falling.

- Special toileting needs such as incontinence, urgency or diarrhoea may also increase the likelihood of a patient falling.

- Other miscellaneous factors that have been associated with an increased risk of falling include diagnosis, type of unit and multiple risk factors. Studies have suggested that patients who have a diagnosis of congestive heart failure, general medical disease, neoplasms or a cerebrovascular accident may have a greater risk of falling. It appears that some patient care areas, such as rehabilitation units and geriatric departments, experience a higher than normal rate of patient falls. Finally, patients with more than one risk factor may be more likely to fall. As the number of risk factors present increases, so does the patient's risk of falling.

It was noted that these characteristics of increased risk of falling differed between studies. It may be that different patient populations will also have different factors that increase their risk of falling during hospitalisation. While this practice information sheet lists the commonly cited factors associated with falls, each individual institution may have patient populations that have their own unique risks.

## Where and When Patients Fall

Many studies have addressed other factors associated with falls and this evidence has been classified as level IV. The majority of falls occur from, or near, the patient's bed, and can account for up to half of all falls. Other common locations include the corridor, bathroom and toilet.

There is contradictory evidence related to the stage of hospitalisation in which

a patient is more likely to fall. Some studies suggest that falls are more likely to occur during the early period of hospitalisation, but this is contradicted by others that have identified later periods of the patient's hospitalisation, or both early and late periods.

Patient transferring from one location to another, usually involving a bed or chair, is the most commonly cited activity at the time of the patient's fall. Other activities commonly associated with falls include walking, toileting and sitting in a chair, commode or wheelchair. One study in a rehabilitation setting found over half of all falls involved a wheelchair.

## Assessing Patients for Risk of Falling

One strategy that has been employed to minimise the number of falls in hospital patients, is the use of assessment tools to identify those patients at risk of falling. The rationale for this assessment is that if patients at a high risk of falling can be identified, appropriate interventions can then be instituted to minimise this risk. This section is based on level III and IV evidence.

While studies attempted to evaluate falls risk assessment tools, many were of poor quality or used inadequate methods of evaluation. In summarising the results of studies, risk assessment tools have generally had good interrater reliability but are inaccurate. This means that these tools can be used by more than one nurse and produce similar assessment of a patient's risk of falling, however they are unable to distinguish which patients are not at high risk of falling. For example, some tools assessed up to 80% of the hospital population as being at high risk of falling, which limits the opportunity of utilising special fall prevention interventions on high risk patients. A comparison of clinical judgement and an assessment tool showed both were inaccurate at predicting falls.

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Another limitation to the usefulness of falls risk assessment tools is that they do not measure environmental factors that may impact on a patient's likelihood of falling during their hospitalisation. Factors such as new staff, patient acuity and occupancy rates of the department, may all impact on the number of patient falls but are not incorporated into any assessment tool.

A screening program is useful only if there is also an effective treatment or intervention available for patients identified as "at risk". As fall prevention interventions have not been adequately described or evaluated, risk assessment tools are currently of limited value. Assessment tools may have a role in raising staff awareness of the risk of patients falling, but this has not yet been demonstrated.

The application of assessment tools to clinical practice, and their effectiveness, need further study utilising rigorous research techniques. The usefulness of these tools in clinical practice has yet to be demonstrated. While some form of patient assessment is obviously needed, there is currently no evidence to suggest that the generic risk assessment tools identified in the literature offer any additional benefits over tools that are used within a single institution and have been developed based on that population's characteristics.

### **Fall Prevention Interventions**

Only two small randomised controlled trials (RCT) were identified that evaluated fall prevention interventions in hospital settings. Both RCT failed to show any benefit in terms of a reduction in the number of falls. Other studies that addressed fall prevention interventions were uncontrolled clinical trials, many of which could more accurately be termed a practice report rather than a trial. Quality of studies were generally very poor in terms of the methods used by researchers, reporting of method and results, size of the studies, and description of the interventions used during the study.

### **Specific Interventions**

The two fall prevention interventions that were subject to an evaluation by a RCT were bed alarms and the use of identification bracelets. A RCT found no benefit in using a pressure sensitive alarm that was placed between the patient and mattress. One uncontrolled trial found that an alarm attached to patients' legs was effective, but because of the size and methods used in this study, the results must be interpreted with caution.

One RCT evaluated the effectiveness of using identification bracelets to highlight patients at high risk of falling, but did not show any significant benefit in terms of a reduction in the number of patient falls. Identification bracelets, coloured stickers and signs on patient's charts, beds or doors have been commonly used in studies as part of a program of multiple interventions, but because of the research methods used, or lack of rigour in the studies, interpretation of these results is difficult.

As a result of this lack of evidence, no recommendations can be made regarding the effectiveness of alarm systems and identification bracelets for reducing patient falls.

### **Multiple Interventions**

The most common approach to fall prevention in reviewed studies was a program of multiple interventions aimed at minimising individual patient's risk of falling. These programs typically consisted of an assessment of the patient's risk of falling, then implementation of interventions to minimise these risks. While this approach has been shown to be effective in the non-hospital setting, its effectiveness has not yet been demonstrated in hospitals. In the studies reviewed the results are contradictory, with some studies reporting a reduction in the number of falls, while others report no change or an increase in the number of falls.

The quality of this group of studies was variable with many providing little information on the methods used, the intervention or the actual results. Information regarding how interventions were selected and implemented was not provided in many studies.

Despite the contradictory results a program of multiple interventions is the most common approach to fall prevention and represents current best evidence based on expert opinion (level IV evidence). The components of these programs are discussed below.

### **Assessment**

Fall risk assessment was a common feature of most studies identified. This assessment provided the basis for selection and then implementation of suitable interventions.

### **Education**

Many studies involved education as part of their falls prevention program. The education targeted staff members, patients and relatives, and aimed to increase their awareness of the risk of falling during hospitalisation and provide possible strategies to minimise this risk. Some studies formalised this process by including the patient fall education in a general orientation to the ward or department.

### **Risk of Falling Diagnosis**

Some studies formalised the communication of a patient's risk of falling by incorporating a diagnosis or problem such as "At Risk of Falling" or "Potential for Injury" in their records and charts. Some developed a standardised nursing plan for patients at high risk of falling, while others interviewed all patients within 24 hours of a fall to assess the patient's risks and to plan their rehabilitation. The concept of Universal Fall Precautions has been used, acknowledging that all patients are potentially at risk of falling, but how this is incorporated into clinical practice has not been adequately described.

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### **Environmental Issues**

Activities have been utilised that aim to minimise the risk caused by the hospital environment. These activities focus on minimising obstacles and clutter near the patient's bedside, improving lighting and ensuring furniture and fittings, that might be used by a patient for balance, are stable.

### **Elimination**

Special toileting needs were identified as a factor that increased a patient's risk of falling and interventions to support the patients elimination needs were common to many programs of fall prevention interventions. This was achieved by strategies such as placing patients with urgency near toilets, regularly checking patients receiving laxatives and diuretics, and toileting at risk patients routinely.

### **Mobility**

To limit falls as a result of impaired mobility, interventions such as ensuring patients wear non-skid footwear, instructing patients to rise slowly and assisting high risk patients to transfer have been incorporated into fall prevention programs. Some studies used the intervention of walking patients in the corridor once or twice per shift.

### **Mental State**

Altered mental status was the most commonly identified risk factor for falling and it is perhaps the most difficult to manage in terms of minimising the risk of falling. While restraints and bedrails have been commonly used in practice for this group of patients, studies have shown that they are not reliable interventions. Interventions trialed in studies include involving relatives in the care, orientating all patients to the hospital environment, and nursing confused patients in a low bed.

### **Bedrest**

As the majority of falls occur at the patient's bedside, most studies utilised

some interventions aimed at minimising this risk. Examples of these interventions include ensuring the bed is in a low position, the bed brakes are locked and that the patient can reach necessary items. Some studies recommend the use of half length bedrails to reduce patient's need to climb over rails to exit the bed. In addition, an uncluttered obstacle free bedside has also been recommended.

### **Medications**

Some studies utilised strategies such as reviewing the patient's medications regularly and limiting combinations of high risk medications to minimise the risk of falling as a consequence of the side effects of some medications.

### **Wheelchairs and Chairs**

Falls involving wheelchairs chairs and commodes have been reported in descriptive studies. Interventions used to limit this risk include the use of safety straps or seat belts in chairs and wheelchairs, and the use of latex mesh in chairs to prevent slipping. Selection of suitable chairs that have arm rests and are of appropriate height for rising and sitting may also help minimise falls.

### **Miscellaneous**

Many other interventions have been used to reduced the risk of falling, including coloured identification arm bands and stickers for doors and patient charts, ensuring the patient understands how to use and can reach their call bell and reassessing staffing needs in relation to high risk patients.

### **Restraints and Bedrails**

The use of physical restraint is a controversial method to minimise the risk of falls through limiting mobility of at risk patients. There is a range of physical restraint devices, including, jackets and vests, limb restraints, mitts, wristlets, anklets and wheelchair restraints. The nature of bedrails is

less clear, as they have been viewed both as a restraint device and as a safety device.

Studies have shown that some falls will occur despite restraints being in use at the time of the fall. There are currently no studies that evaluate the effectiveness of restraint devices in an acute care setting. Bedrails are also commonly used to minimise falls from hospital beds, but descriptive studies have shown that patients fall from bed despite bedrails being raised. While bedrails come in varying lengths, there is no information on which are the most effective in stopping falls. There is also no evidence available on which patients will benefit by the use of bedrails.

From the studies reviewed, it is clear that bedrails and restraint devices do not provide complete protection from falls. There is some suggestion that physical restraint of patients can be replaced by other fall prevention strategies without an increase in patient falls, but this has not been supported by rigorous research. Because of this lack of information no recommendations can be made regarding the use of restraints and bedrails.

### **Consciousness Raising**

Some studies have reported that as a result of implementing a fall prevention program, there was an increased awareness by health care workers of the risk factors associated with patient falls and of potential prevention strategies. This 'consciousness raising' of staff may play an important role in the reduction in patient fall numbers. If consciousness raising is a major factor, there is no evidence on how long this effect can be maintained. Because this issue has not been addressed by any study, no specific recommendations can be made, but it appears that activities that promote or increase staff awareness of patient falls should be incorporated in to any fall prevention program.

# Multiple Fall Prevention Interventions

The most common approach to fall prevention was the use of a program of multiple interventions that aimed to minimise the patient's risk of falling. This table summarises these interventions which represent current best available evidence based on expert opinion.

## **Assessment**

Some form of assessment of a patient's risk of falling was utilised in most studies, particularly in the following situations:

- all confused and elderly before settling at night
- post operative patients
- on admission to the hospital or department
- all elderly on prescribed analgesics or sedatives

## **Risk of Falling Diagnosis**

Some studies have specifically targeted high risk patients in the following ways:

- incorporating a diagnosis or problem such as "At Risk of Falling" or "Potential for Injury" in the patient's records and charts.
- implementing a clinical treatment and rehabilitation program to reduce falls from internal causes
- interviewing all patients within 24 hours of a fall to assess the patients risk and to plan their rehabilitation.

## **Education**

Educational activities were a common component of fall prevention programs, and examples of how this has been utilised include:

- staff training to increase awareness of high risk patients and prevention strategies
- educating the patient and family about the risk of falling, safety issues and their mobility limitations
- teaching patients to make position changes slowly
- orientating patients to their bed area, ward facilities and how to get assistance
- education programs for all new and high risk patients

## **Environmental Issues**

Activities that aim to reduce environmental risks include:

- decreasing environmental risks, obstacles and clutter
- nightlights at bedside and toilet
- stabilising beds and bedside furniture
- having grab bars near toilets which are fitted vertically rather than in a horizontal position

## **Elimination**

Interventions to support the patient's elimination needs were common to many programs of fall prevention, and include:

- placing patients with urgency near toilets
- checking patients who are receiving laxatives and diuretics
- toileting at risk patients routinely
- instructing male patients prone to dizziness to void whilst sitting

## **Medications**

Activities related to medication that have been utilised include:

- reviewing prescribed medications frequently
- checking patients receiving laxatives and diuretics
- limiting combinations of medications when possible (eg sedatives, analgesics, etc)

## **Mobility**

Interventions related to mobility that have been used in studies include:

- non-skid footwear
- providing physical therapy
- instructing patients to rise slowly
- walking high risk patients
- repeating activity limits to patient and family
- assisting high risk patients transfer
- walking patients in corridor once or twice per shift

## **Mental State**

Altered mental status was the most commonly identified risk factor for falling and interventions used in studies to address this problem include:

- re-orientating confused patients
- orientating patients to the hospital environment
- moving confused patients near nurses station
- using family members to sit with confused patients
- nursing confused patients in low bed

## **Bedrest**

Interventions that aim to reduce the risk of falling while the patient is in their bed include:

- ensuring bed is in a low position
- ensuring bed brakes are on
- using bedrails if appropriate
- ensuring patient can reach necessary items
- using half bedrails to reduce patient's need to climb over the rails to leave the bed

## **Wheelchairs and Chairs**

Falls involving wheelchairs have been reported in descriptive studies, and interventions used to reduce this risk include:

- using safety straps or seat belts in chairs and wheelchairs
- using geriatric chairs
- using latex mesh in chairs to prevent patients slipping
- selecting suitable chairs that have arm rests and are of appropriate height for rising and sitting

## **Miscellaneous**

Many other interventions have been used to reduce the risk of falling and include:

- using coloured identification arm bands and stickers for doors and patient charts
- utilising occupational therapy and diversional therapy
- demonstrating the use of call bell to patients and ensuring it is within reach of patient
- involving family in care
- reassessing staffing needs in relation to high risk patients

# Fall Prevention Recommendations

This Table summarises the recommended components of a fall prevention program which represents best available evidence based on expert opinion.

## Know Which Patients Are At Risk of Falling

It is important to know which patients are at risk of falling.

- assess patients for risk of falling
- identify activities associated with a high risk of falling

## Have a Fall Prevention Program

Hospital and departments should have some form of program aimed at preventing patient falls.

- develop a formal strategy to prevent patient falls
- document and communicate the fall prevention strategy
- develop a standardised plan for the nursing care of patients at risk of falling
- utilise multiple interventions to minimise the risk of falling

## Consciousness Raising

Increase staff awareness of fall risk factors and potential prevention strategies.

- educate patients and staff
- orientate patients to ward or department
- ensure patients and staff are aware of what factors might increase the risk of falling
- promote interventions that may minimise the risk of patients falling

## Evaluate Effectiveness of Program

The effectiveness of all prevention interventions must be evaluated.

- monitor and record all patient falls
- evaluate changes in the number of patient falls
- implement changes or modifications to the program in response to evaluation.

## Acknowledgement

This practice information sheet was developed based on a systematic review of research related to patient falls in hospitals undertaken by The Joanna Briggs Institute. A summary of this document can be viewed via the internet (at <http://www.joannabriggs.edu.au>).

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