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- physicians, nurses, and other health care professional and provider organizations;
- health plans, health systems, health care organizations, hospitals and integrated health care delivery systems;
- health care teaching institutions;
- health care information service departments;
- health care teaching institutions;
- health care information technology departments;
- medical specialty and professional societies;
- researchers;
- federal, state and local government health care policy makers and specialists; and
- employee benefit managers.

This ICSI Health Care Protocol should not be construed as medical advice or medical opinion related to any specific facts or circumstances. If you are not one of the expert audiences listed above you are urged to consult a health care professional regarding your own situation and any specific medical questions you may have. In addition, you should seek assistance from a health care professional in interpreting this ICSI Health Care Protocol and applying it in your individual case.

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Foreword

Scope and Target Population

This protocol will include recommendations for a risk assessment for falls in hospitalized patients, and will focus on the strategies and interventions required for the prevention of falls and eventual elimination of falls with injury in acute care settings.

The target population is the adult hospitalized patient. This does not preclude the use of fall prevention assessment and intervention in the emergency department (ED), but it is not specifically addressed in this guideline. Fall risk assessment in the ED is relevant in those situations where the presence of high fall risk is a consideration in ward placement of patients admitted to the hospital. Presently, published fall prevention literature gives little, if any, guidance on the role of the ED in fall prevention efforts.

Clinical Highlights and Recommendations

• Best practice results have only been achieved when there is significant organizational support for fall reduction across departments and disciplines. (Annotation #1)

• Best practice in fall reduction includes:
  - strategies of fall risk assessment,
  - visual identification of individuals at high risk for falls,
  - fall risk factor directed interventions, and
  - standardized education to prevent falls with injury.

• There should be interdisciplinary collaboration on fall prevention at the time of admission between admitting providers having first contact with the patient, including admitting physicians, pharmacists and nurses.

• Fall risk assessment (regardless of age) should at a minimum include:
  - a determination if the patient has fallen in the last year, and
  - a functional performance test – visual observation of the patient's mobility for those not confined to bed rest. (Annotation #2)

• Acute care settings should implement a visual identification system for patients at risk of falling. (Annotation #4)

• Communication of fall risk across departments and disciplines (including to attending physicians) should be reliable. (Annotation #4)

• Multifactorial interventions have been found to be effective on falls. (Annotation #5)

Priority Aims

1. Eliminate all falls with injury in the acute care setting.

2. Increase the percentage of patients who are screened by an interdisciplinary team for risk of falls on admission and with a change in clinical status.

3. Increase the percentage of patients who receive the appropriate falls prevention interventions.
Key Implementation Recommendations

The following system changes were identified by the protocol work group as key strategies for health care systems to incorporate in support of the implementation of this protocol.

1. Organizational leadership needs to identify and support an interdisciplinary falls prevention team comprised of clinical and non-clinical staff to oversee the falls prevention program. The team should include at least one provider with a background or additional education in falls prevention.

2. Organizations need a reliable process in place for a comprehensive, interdisciplinary clinical assessment, communication and risk factor intervention plan.

3. Falls prevention education should be provided to patients, families, clinical and non-clinical staff.

4. Organizational leadership needs to support systems that promote learning, ongoing evaluation and improvement of the falls prevention program including analysis of fall rates and injuries (fall/1,000 patient days and fall with injury/1,000 patient days). The analysis should report on the internal effectiveness (validity) of fall screening and effectiveness of interventions applied to those screened at risk.

Related ICSI Scientific Documents

Related Guidelines

- Preventive Services for Adults

Disclosure of Potential Conflict of Interest

ICSI has adopted a policy of transparency, disclosing potential conflict and competing interests of all individuals that participate in the development, revision and approval of ICSI documents (guidelines, order sets and protocols). This applies to all work groups (guidelines, order sets and protocols) and committees (Committee on Evidence-Based Practice, Cardiovascular Steering Committee, Women's Health Steering Committee, Preventive & Health Maintenance Steering Committee, Respiratory Steering Committee and the Patient Safety & Reliability Steering Committee).

Participants must disclose any potential conflict and competing interests they or their dependents (spouse, dependent children, or others claimed as dependents) may have with any organization with commercial, proprietary, or political interests relevant to the topics covered by ICSI documents. Such disclosures will be shared with all individuals who prepare, review and approve ICSI documents.

No work group members have potential conflicts of interest to disclose.

Introduction to ICSI Document Development

This document was developed and/or revised by a multidisciplinary work group utilizing a defined process for literature search and review, document development and revision as well as obtaining and responding to ICSI members.

Evidence Grading System

A. Primary Reports of New Data Collection:

Class A: Randomized, controlled trial
Class B: Cohort study
Class C: Non-randomized trial with concurrent or historical controls
   Case-control study
   Study of sensitivity and specificity of a diagnostic test
   Population-based descriptive study
Class D: Cross-sectional study
   Case series
   Case report

B. Reports that Synthesize or Reflect upon Collections of Primary Reports:

Class M: Meta-analysis
   Systematic review
   Decision analysis
   Cost-effectiveness analysis
Class R: Consensus statement
   Consensus report
   Narrative review
Class X: Medical opinion

Citations are listed in the guideline utilizing the format of (Author, YYYY [report class]). A full explanation of ICSI's Evidence Grading System can be found at http://www.icsi.org.
Protocol

**Perform risk assessment to identify risk factors** *(Annotation #3)*

- Test for cognitive dysfunction (dementia, delirium)
- Assess gait and mobility function
- Identify potential medication factors
- Perform an environmental safety assessment

**Communicate risk factors** *(Annotation #4)*

- Use visual communication tools
- Inform patient and family of risks
  - Describe organization's fall prevention program – discuss how patient/family can assist with fall prevention and when/how to contact staff when necessary
- Communicate patient fall risk to all members of the health care team

**Perform risk factor interventions** *(Annotation #5)*

- Establish universal falls interventions for all patients
- Add strict fall precautions for patients at risk
- Implement behavioral interventions
- Implement impaired mobility interventions
- Perform environmental rounds

**Continuous monitoring and reassessment** *(Annotation #6)*

Monitor at regular intervals – suggest hourly

Reassess:

- at shift change
- if change in clinical status
- following a fall
Algorithm Annotations

Introduction

Falls are a leading cause of hospital-acquired injury, and frequently prolong or complicate hospital stays. Falls are the most common adverse event reported in hospitals. (National Center for Injury Prevention and Control: Falls among Older Adults: An Overview. http://www.cdc.gov/ncipc/factsheets/adultfalls.htm)

Current data on fall rates in acute care hospitals are far from complete. Massachusetts recently publicly reported average rates of 3.57 falls/1,000 patient days in hospitals of 200-299 beds, and 4.76 falls/1,000 patient days in hospitals over 500 beds. Injuries from falls were 0.96/1,000 patient days and 0.64/1,000 patient days, respectively, on medical units.

The National Health Service of the United Kingdom reports an average fall rate of 4.8 falls/1,000 patient days nationwide (National Patient Safety Agency UK, 2007). The Ascension Health Care organization has suggested a benchmark for better performers of 2.5-3.5 falls/1,000 patient days, and that injury rates as low as 0.1/1,000 patient days are achievable (Lancaster, 2007 [D]).

A leading goal of the patient safety movement is the reduction and eventual elimination of falls that result in injury. Therefore, fall prevention programs should focus on factors associated with increased injury risk. The epidemiology of falls with injury may vary by hospital type, such as academic or non-academic, or physical plant factors. A retrospective cohort study of nine midwestern hospitals stated that injury was associated with older age, unassisted falls, bathroom falls and in patient care areas outside of the patient's room (Krauss, 2007 [C]).

Findings such as these, influence the rationale for commonly used interventions. These include close observation, visual identifiers and communication of fall risk to all departments and disciplines.

In spite of extensive research on fall risk factors and the development of a number of fall risk instruments, rates of falls and falls with injury are still generally considered unacceptable. Protocols are applied inconsistently and risk factor directed interventions are far from standardized.

Research on fall reduction in acute care hospitals has yielded relatively few randomized trials and achievable benchmarks are far from certain. Fall prevention interventions are complex and multifactorial. Randomized trials are unlikely to be the main source of clinical evidence in this situation (Oliver, 2006 [M]).

The work group has worked to combine current knowledge of fall risk factors and interventions in the acute care setting into a suggested best-practice protocol.

Definitions

Fall: a fall is defined as any unplanned descent to the floor.

Falls with injury: a five-point injury scale is recommended:

1. No apparent injury.
2. Minor: bruises or abrasions as a result of the fall.
3. Moderate: an injury that causes tube or line displacement, a fracture, or a laceration that requires repair.
4. Major: injury that requires surgery or a move to intensive care unit for monitoring a life-threatening injury.
5. Death
Injuries rated as 3-5 are reported as falls with serious injury/1,000 patient days.

(Lancaster, 2007 [D])

1. Obtain Organizational Support for a Falls Prevention Program

It is clear that application of a fall risk tool or prevention protocol by themselves will have little impact on rates of falls and falls with injury. Organizational support for making fall injury prevention a highly prioritized, well-publicized organizational aim that touches all disciplines and departments is necessary for achieving best results. This includes involving and enlisting the support of medical staff of health care organizations to a much greater degree than has been done in the past. This support has been linked to fall reduction rates (Healey, 2007 [R]; Lancaster 2007 [D]).

Best-practice results have only been achieved when there is significant organizational support for fall reduction across departments and disciplines.

• The organization has an interdisciplinary group in place to oversee the strategic plan for the falls prevention program.
  - The falls prevention program plan is reviewed by the group and updated periodically throughout the year.
  - The organization utilizes a "Unit-Based Champion" approach to falls prevention (or a hospital-wide champion approach for smaller facilities).
  - The organization has falls prevention program policies and procedures that are designed for differential interventions based on specific populations and units.

• The organization supports recommendation from the fall prevention group on equipment and environmental safety.

Education of Fall Reduction Policies and Procedures

All clinical and non-clinical staff should understand the hospital's policies and procedures in place for the prevention of falls. Education measures should include:

• All staff are educated on fall prevention indicators and postfall protocols for specific organization.

• Education is ongoing and includes brief understanding of the assessment tool and the implications and strategies for fall prevention.

• All staff should be aware of environmental indicators that can be a potential hazard to patient safety/falls.

2. Establish a Process for Evaluation of the Hospitalized Patient on Admission for Risk of Falling

The question for all hospital staff assessing a patient is "Will this patient fall?" Staff members include physicians, nurses, nursing assistants, transport aides and support staff. In answering this question, current available literature suggests fall risk prediction can be condensed to two elemental questions:

1. Has the patient fallen in the last year?

2. Does he or she look like he or she is going to fall? In other words, does he or she have a clinically detectable abnormality of gait or balance?
The systematic review (Ganz, 2007 [M]) of fall prediction in community dwelling elderly found that the most consistent predictors of future falls were a history of falls in the last 12 months (likelihood ratio range 2.3-2.8) and clinically detected balance and gait abnormalities (likelihood ratio range 1.7-2.4). It is important to note that visual impairment, medication variables, and impaired cognition or activities of daily living deficits did not consistently predict falls across studies of community dwelling elderly.

These domains are often included in assessments of fall risk upon patient admission to acute care hospitals. Assessment instruments have been developed in the last 10-15 years including these domains or risk factors to better predict fall risk on admission and direct fall prevention resources to those patients.

There is no disagreement that some type of fall risk assessment should occur at patient admission to the hospital unit or ward. Only recently has the concept of moving fall risk assessment into the ED been mentioned as part of a multifactorial fall prevention protocol (Lancaster, 2007 [D]). There is currently insufficient data in the literature to recommend for or against this approach. It is a concept that health care organizations may wish to pilot. This protocol focuses on the literature for inpatient assessment tools administered after patients arrive on hospital units.

A number of fall risk assessment instruments (the Hendrich I and II, Johns Hopkins, Innes, Morse, STRATIFY, Downton, Tinetti and Schmidt) have been developed and validated. To date, there has been no consensus as to whether any of these assessment instruments was better than others in fall prediction. In fact, even the best of these scores in terms of sensitivity and specificity underpredicted and overpredicted falls in acute care settings (Healey, 2007 [R]). Fall risk assessment instruments by themselves do not prevent falls, but only predict them. In addition, many of these scores may take four to seven minutes to complete per patient, straining nursing resources (Vassallo, 2005 [C]).

If a risk factor score is used, a further assessment that identifies and treats the modifiable (also termed personal) risk factor is required. Oliver, a developer of the STRATIFY tool, concluded in a recent systematic review that the focus of fall risk assessment should shift directly to identifying and treating those modifiable risk factors. This review included many commonly used scales, such as STRATIFY and Morse. It did not include the Hendrich I scale, as the data were insufficient to calculate odds ratios and confidence intervals (Oliver, 2004 [M]).

The more recently developed and commonly used Hendrich II fall risk model was not included in the above review. This model includes an easily performed assessment of mobility, names modifiable risk factors, and directly links to interventions or a set of strict fall risk precautions. A score of 5 or greater is classified as high fall risk. Wide spread use and incorporation of the Hendrick II into the electronic medical record has been linked to achievement of fall rates in the "better performer" category of 2.5-3.5 falls/1,000 patient days (Hendrich, 2003 [C]; Lancaster, 2007 [D]; Premier safety Web site retrieved 8/2007).

If a fall risk assessment is used, internal validation of the instrument within the hospital should occur on a periodic basis (Healey, 2007 [R]). At a minimum, this would include completing a 2x2 table of fall prediction.

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Fall N (%)</th>
<th>Did not fall N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessed as high fall risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not assessed as high fall risk</td>
<td></td>
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</tbody>
</table>

From this table, sensitivity and specificity at the facility can be calculated on a periodic basis to determine if the risk assessment tool is performing with adequate sensitivity.

The alternative to using a fall risk assessment instrument is a simple screening protocol of determining if a patient has fallen in the last year, and performing a mobility assessment, either a get up and go test or a timed get up and go test in addition to the clinical judgment of the person assessing the patient (Mathias, 1986 [C]).
See Resources Available to find examples of the Get Up and Go Test and the Timed Get Up and Go Test. If either of these screening measures suggests increased fall risk, the assessor should determine the modifiable risk factors and identify fall prevention interventions triggered by the presence of that risk factor.

On the basis of the current literature, this work group concluded that:

- falls risk scores are not an essential part of falls prevention policies;
- the falls risk score may under or overpredict patient falls;
- any falls risk score should be tested at the facility for specificity and sensitivity;
- of the currently available fall risk scores, the Hendrich II has been associated with better performance benchmarks in fall prevention in a major multihospital health care system; and
- a second stage of assessment for modifiable (personal) risk factors leading to risk factor specific interventions should be done.

3. **Perform Risk Assessments to Identify Risk Factors**

**Cognitive Dysfunction as a Risk Factor**

When discussing the cause of many geriatric syndromes, it is evident that multiple factors work together to cause the syndrome at hand. The issue of falls in the elderly is no different. One of the well-established risk factors for falls in the inpatient setting is cognitive dysfunction. Practically, this can be thought of in two ways: patients with preexisting cognitive impairment or dementia, and those who develop an acute state of severe confusion, or delirium. Patients with dementia are known to be at higher risk for delirium, but delirium can occur in patients with baseline normal cognitive function. This section of the protocol will focus on these two conditions as independent risk factors for falls.

**Delirium**

Delirium has many synonyms, including acute confusional state, altered mental status, reversible dementia, and organic brain syndrome. Over 30% of geriatric hospitalized patients will suffer from delirium at a point during their hospitalization. Approximately 15% of elders present to the emergency room with delirium. Patients may be agitated, hypoactive, hallucinate or demonstrate emotional lability.

All patients over the age of 65 years on admission, regardless of admitting diagnosis, should be assessed for both dementia and delirium. Geriatric patients with acute illnesses are known to be at a higher risk of falling. This group's review of the literature has identified multiple systematic reviews and original articles demonstrating that patients with delirium or confusion are at higher risk of falls. In one review, altered mental status was identified as the most common risk factor. Other studies have consistently demonstrated that patients with confusion are at higher risk for falls as compared to those without confusion. Agitation in a case-control study (Oliver, 1997 [C]) demonstrated an odds ratio of 20.9 [9.62:45.62].

There are a number of causes of delirium, the most common of which include acute cardiac or pulmonary events, constipation/rectal impaction, drug withdrawal, electrolyte/metabolic abnormalities, fluid disturbances, indwelling devices, infections, medications, restraints, uncontrolled pain, and urinary retention. Management of delirium initially relies on the ability to determine its underlying cause. Further non-pharmacological and pharmacological treatment approaches are warranted, but outside the scope of this review.

Recognition of delirium is particularly important as a modifiable risk factor for falls and a multidisciplinary approach is needed to screen patients. We advocate the use of the four-item Confusional Assessment Method (CAM) (Inouye, 1990 [C]), as it has a sensitivity of 94%-100%, a specificity of 90%-95% and a high inter-observer reliability. This tool is easy to administer and use, and requires very little training. See Resources Available for CAM.
In the inpatient setting, we recommend two approaches in screening patients for cognitive impairment. The first is the Mini-Cog, a clinical tool advocated by the Society of Hospital Medicine as a screening instrument for dementia. It involves three items plus a clock-drawing test, can be administered in three minutes, and is highly reproducible and reliable (Borson, 2000 [C]). Two other methods of screening include the Folstein Mini-Mental Status Examination and the Kokmen Short Test of Mental Status. Both can take up to 10 minutes to administer and have been well validated in previous studies in screening for dementia. The MMSE is well accepted and commonly used. However, a significant disadvantage is that it is copyrighted and would require a license for use in institutions. Patients with a MMSE score of less than 24/30 are at higher risk for falls. The Kokmen is public domain and has been shown to be just as effective as the MMSE and can be used free of charge. An alternative screening method includes the Short Portable Mental Status Questionnaire (Pfeiffer, 1975 [C]). This 10-item questionnaire is easy to administer and patients with five or greater incorrect items have been demonstrated to be at a higher risk of falls (Tinetti, 1988 [B]).

See Resources Available for Mini-Cog and Kokmen Short Test of Mental Status.

Impaired mobility

Impaired mobility has been identified as being a risk factor for falling. This includes impaired gait, weakness, decreased lower extremity mobility, decreased coordination, and balance. The literature also suggests that patients that fall were more likely to have been using an assistive device (Evans, 1998 [M]).

Physical assessment of the patient's mobility is an important factor in the identification of patients at risk for falling. The literature contains several different tools to use but does not adequately define the "best" tool. Examples of tools include the Timed Get Up and Go Test, the Tinetti, and the Berg.

The Get Up and Go test takes about five minutes and has patients perform six tasks. It is scored on a five-point scale with 1 being normal and 5 being severely abnormal. The Tinetti Assessment tool takes 10 to 15 minutes. It has been shown to have good interrator reliability. Patients who score 19 or below are at high risk for falls. Patients who score between 19-24 are at risk for falls. The Berg Balance Measure tool takes 15 to 20 minutes. The patient performs 14 tasks to challenge their balance. The higher the score, the more independent the patient is (Berg, 1989 [C]; Mathias, 1986 [C]; Podsiadio, 2000 [C]; Tinetti, 1986 [C]).

Medications

Many medications have been implicated as risk factors for falls. Elderly are more prone to adverse effects of medications due to changes in metabolism and slowed clearance from renal and hepatic impairment. In addition, drug interactions leading to adverse effects by additive or synergistic effects may be more prevalent.
In elderly as they are often on multiple medications (Neutel, 2002 [D]). **Patients on four or more drugs are at greater risk of falls.**

Several drugs are associated with increased fall risk in elderly. Agents that have been associated with falls are anticonvulsants, antidepressants, antipsychotic, benzodiazepines, Class 1A antiarrythmics, digoxin, opiates and sedative hypnotics.

Particular drugs may be an independent risk factor in itself causing falls in elderly, but other parameters relating to drug use can increase risk even further. For example, with benzodiazepines the risk increases in the first two weeks and higher doses have higher risk (greater than 8 mg diazepam or equivalent) (Leipzig, 1999 [M]; Tinetti, 2003 [R]). Benzodiazepines have been recognized as independent risk factors for falls among elderly. Benzodiazepines with a shorter half-life were positively associated with falls during hospital stay. The risk increases if other psychotropic drugs or diabetic medications are being used, if the patient has cognitive impairment, if comorbidities are present, if greater than 80 years of age, or if they were in hospital longer than 17 days. Long-acting benzodiazepines increase falls and the risk of hip fracture (Passaro, 2000 [D]).

Psychotropic medications have about a twofold increased risk of falls and fractures. Similarly there is strong evidence for antidepressants increasing fall risk – particularly the tricyclics. Antidepressants and antipsychotics can cause drowsiness, gait imbalance, lack of coordination or slow reaction, confusion, orthostatic hypotension and involuntary muscle contractions, all of which can lead to a fall (Leipzig, 1999 [M]).

There are different mechanisms by which medications increase the fall risk. A key mechanism seems to be the orthostatic hypotension (defined as a drop in systolic blood pressure greater than 20 mmHg or a drop in diastolic BP greater than 10 mmHg on standing). Antihypertensive medications, antiarrythmics, antianginals and anti-parkinsonian drugs can cause low blood pressure or orthostatic hypotension, which can cause dizziness and fainting. A very slow heart rate can also cause falls.

Diuretics can increase frequency of urination, leading to frequent toilet trips and can provoke a fall. Low potassium can cause weakness, leading to a fall.

Allergy and cold medications (antihistamines/diphenhydramine, etc.) can cause drowsiness, confusion and dizziness. Diabetic medications can cause very low blood sugars, leading to weakness, confusion and dizziness, which in turn can cause a fall.

**Environmental**

Physical hazards are often involved in patient falls. An environmental assessment or checklist can often identify modifiable risk factors to falls, such as lack of floor mats, handrails in toilets, poorly anchored rugs or clutter (Agnostini, 2001 [R]).

See Resources Available for an example of environmental checklist.

### 4. Communicate Risk Factors

**Visual Communication**

Identify those at risk by placing visual identifiers such as signs on room and bathroom, wristbands, buttons, stickers, posters, chart identifiers, door/name identifiers, etc.

Members of the health care team, in all departments, should be educated in recognizing these cues. Also all family and visitors should be educated in recognizing and understanding the identifiers and be aware of how to obtain help from appropriate staff.
Examples of visual identifiers/cues

- Catch a Falling Star Program: falling star on door to patient room, yellow armband on patient, non-skid slipper socks on patients.

- Ruby Slippers Program: Ruby Slippers or Red Star sign on door to patient room, red non-skid slipper socks on patient's feet, red stickers on front of chart/cardex, special ruby slipper marker on patient's census board.

- SAFE Program: "Stay Alert for Fall Event": yellow SAFE sign on door, yellow armband on patient, non-skid slipper socks on patient.

- LAMP Program: "Look at Me Please": yellow lamp sign on door, yellow armband on patient, non-skid slipper socks on patient.

- IRIS Program: "I Require Intensive Surveillance:" Sign on door, pink armband in place, non-skid slipper socks on patient.

Visual Cues Program from The Joint Commission Journal on Quality and Patient Safety July 2007 (Lancaster, 2007 [D]).

Communication to Patients and Families

- Notify patient and family of fall risk upon admission, as risk changes, and upon discharge.
- Describe the organization's fall prevention program and educate the patient and family in recognizing and understanding visual identifiers.
- Clarify reasonable expectations of the organization.
- Discuss how the patient and family members can assist with fall prevention and when/how to contact staff when necessary.
- Document evidence of patient education regarding fall risk, and the patient and family members understanding of the risk and prevention measures.

(Tinetti, 1994 [B])

Communication to Members of the Health Care Team Who Come in Contact with Patient

The goals of communication are seamless transition of patient information from one unit to another, one caregiver to another and one department to another. With the Joint Commission's new 2008 National Patient Safety Goal #2E, organizations must implement a standardized approach to hand off communications. In a hospital, such interactions may occur upon arrival to or from the following patient care areas:

- Radiology
- Procedure suites for cardiac catheterization
- Endoscopy
- Physical therapy

Visual identifier clues (ruby slippers, falling stars, wristbands, etc.) should be active and prominent so every department that is dealing with the patient should be able to relate to the high risk status of the patient. Members of the health care team, in all departments, should be educated in recognizing these cues.
A transport procedure checklist documents the information for transfer of the patient and responsibility for care from one department and caregiver to another. Similarly some facilities use a patient passport, is a comprehensive checklist that must be completed and signed before a patient can leave the care unit. Such a checklist should include the risk fall status and recommendations such as "do not leave the patient unattended."

If a patient receives medications, such as midazolam and lorazepam for procedures or radiology tests, communicate this to nursing staff on the patient's unit. A handoff communication protocol such as SBAR (Situation, Background, Assessment, Recommendation) is recommended. The patient should then be monitored closely for the next 24 hours as the risk for falling increases with these medications.

5. **Perform Risk Factor Interventions**

**Universal Falls Interventions**

*These interventions should be present for all patients regardless of risk of falling*

- Familiarize the patient to the environment.
- Have the patient demonstrate call light use.
- Maintain call light within reach.
- Keep patient personal possessions within patient reach.
- Have sturdy handrails in patient bathrooms, room and hallway.
- Place hospital bed in low position.
- Keep hospital bed brakes locked.
- Keep non-slip, well-fitting footwear on patient.
- Utilize night light or supplemental lighting.
- Keep floor surfaces clean and dry. Clean up all spills promptly.
- Keep patient care areas uncluttered.
- Communicate patient fall risk to all caregivers.

*(Agnostini, 2001 [R])*

**Strict fall precautions (for patients at risk). Universal interventions, plus the following:**

- Mark patient's door with "Please help prevent falls" sign.
- A staff member must remain with the patient when assisted to the bathroom.
- Offer assistance to bathroom/commode or use bedpan hourly while awake.
- Walking/transfer belts available near the bedside.
- Assess need for home safety evaluation, including physical and occupational therapy consultation, as part of discharge planning needs.
- Staff member performs hourly checks of patient.
- Assess the need for 1:1 monitoring and arrange as needed.
- Use chair or bed alarm.
Behavioral interventions can be used in patients with dementia in order to prevent falls. There is limited success with pharmacotherapy. These interventions can be implemented by the multidisciplinary team and should be communicated to the patient's primary care provider in order to prevent falls in the outpatient setting. Maintain consistency in procedures, routines and schedules, and staff allocation. Identify possible triggers for agitated, impulsive behavior, such as a particular medication, time of day, infection or loud noise, and minimize them when possible.

Refer the patient to occupational and physical therapists to assist with behavioral management, to develop a plan to maximize orientation, awareness and function, and to determine whether gait aids are needed and used appropriately and correctly.

Impaired mobility interventions should be multidisciplinary in nature. The following interventions have been employed by hospital systems to reduce fall rates. However, the literature is contradictory in determining which intervention is most effective. Hospitals generally use multiple interventions to produce their improvement in fall rates.

(Evans, 1998 [M]; VA National Center for Patient Safety, 2004 [R])

Interventions:

- Patients should wear their shoes or non-skid footwear (some have used red slippers for easy identification by staff).
- PT and OT consults for evaluation treatment
- Instruct the patient to rise slowly
- Early and regular ambulation of high-risk patients
- Repeated education of safety measures to the patient and family members
- Assist high-risk patients with transfers
- Use of patient's regular assistive device such as a walker or cane, or equipment recommended by PT or OT
- Regularly scheduled assistance with toileting
- Provide supportive chairs with armrests
- Apply hip protectors to patients at high risk for hip fracture
- Adequate day time and night time lighting for ambulation and activities of daily living
- Elevated toilet seats
- Use of a gait belt or transfer belt during mobility activities

(Evans, 1998 [M]; VA National Center for Patient Safety, 2004 [R])

Environmental Interventions

Facility management, nursing and biotech staff should perform environmental rounds to confirm that hallways and patient areas are well lit, uncluttered and free of spills. Also that locked doors are kept locked when unattended, handrails are secure, and tables and chairs are sturdy. Biotech staff should inspect assistive devices regularly. Nursing staff should confirm that patient rooms are set up in a way that minimizes the risk of falling. All staff should make sure that unsafe situations are dealt with immediately.

See Resources Available for an example of environmental rounds.
In recent reviews, the authors reported on hip protectors, removal of physical restraints, fall alarm devices and other physical environmental changes.

**Hip protectors:** These are a consideration in hospital wards where strict fall precautions or close observation is problematic. Examples might include rehab units, behavioral health units or geriatric psychiatry units.

Hip protectors were associated with reduction in hip fracture (ratio 0.67) but not in fall rates (Oliver, 2006 [M]). The variability of hip protector types and patient tolerance of the protectors remain significant barriers that preclude their being a standard component of strict fall precautions (Healey, 2007 [R]).

**Removal of physical restraint:** A meta-analysis that included a hospital stroke ward showed a reduced rate ratio for falls (Oliver, 2006 [M]).

**Fall alarm devices:** One study in a nursing home reported a significant reduction in falls with alarm devices (Oliver, 2006 [M]). Associations with fall reduction in hospitals are far less clean. Another recent literature review has found only one small hospital study concluding that they were not effective in fall prevention. Suggested reasons for this lack of effectiveness are related to temporal factors. Patients with severe gait instability who will fall as soon as they get out of bed or a chair will not be protected by these devices (Healey, 2007 [R]).

**Beds:** Beds that have low height have recently been associated with fall reduction. These beds have various features but must be able to get within 8-10 inches off the floor. One large health care system reported that integration of beds with features of pressure redistribution surfaces, built-in alarms and ability to get within 8-10 inches of the floor was linked to a 9% fall rate reduction within five months. The average fall rate after bed integration of 2.43 falls/1,000 patient days is on the lowest end of reported fall rates in the literature to date (Lancaster, 2007 [D]). If subsequent reports bear these findings out, hospitals will need to consider facilitywide bed replacement as a key component of their fall and injury reduction strategy.

**Other environmental factors:** One small general hospital study found that wood flooring was associated with a significantly lower injury rate (Healey, 1994 [D]).

Examples of environmental interventions utilized by facilities include:

- purchasing adult assistive walking devices,
- installing convex mirrors to enable nursing staff to visualize all hallways from the nursing station,
- implementing motion detectors at the bedside in patients' rooms,
- having patients use non-slip footwear, and
- upgrading all bed-exit alarms.

(Healey, 2007 [R])

### 6. Continuous Monitoring and Reassessment

All patients admitted to acute care need to be monitored and reassessed on a regular basis. Hourly rounding by nurses to check changes in the patient's condition is one strategy that can determine the need for reassessment (Meade, 2006 [C]). Due to the likelihood of continuous changes, patients should be continuously reassessed even though they may not be in a high-risk fall group. Routine reassessments should occur at shift change, with a change in the patient’s clinical status and following a fall.

The same assessment tool should be used on all reassessments. If risk factors have changed from the previous assessment, interventions need to be revised to address any new risk factors.
Availability of references

References cited are available to ICSI participating member groups on request from the ICSI office. Please fill out the reference request sheet included with your protocol and send it to ICSI.

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Brief Description of Evidence Grading

Individual research reports are assigned a letter indicating the class of report based on design type: A, B, C, D, M, R, X.

A full explanation of these designators is found in the Foreword of the protocol.
References


Barnett K. Reducing patient falls project. Mid Yorkshire Hospitals NHS Trust. 2002. (Class R)


Chang JT, Ganz DA. Quality indicators for falls and mobility problems in vulnerable elders. JAGS 2007;55:S327-S34. (Class M)


Ganz DA, Bao Y, Shekelle PG, Rubenstein LZ. Will my patient fall? JAMA 2007;297:77-86. (Class M)


Healey F. Does flooring type affect risk of injury in older in-patients? Nurs Times 1994;90:40-41. (Class D)


Hendrich AL, Bender PS, Nyhuis A. Validation of the Hendrich II fall risk model: a large concurrent case/control study of hospitalized patients. Applied Nursing Research 2003;16:9-21. (Class C)


References


Meade CM, Bursell AL, Ketelsen L. Effects of nursing rounds: on patients' call light use, satisfaction, and safety. *AJN* 2006;106:58-70. (Class C)

Neutel CI, Perry S, Maxwell C. Medication use and risk of falls. *Pharmacoepidemiol Drug Saf* 2002;11:97-104. (Class D)


Oliver D, Daly F, Martin FC, McMurdo MET. Risk factors and risk assessment tools for falls in hospital in-patients: a systematic review. *Age and Ageing* 2004;33:122-30. (Class M)


This section provides resources, strategies and measurement specifications for use in closing the gap between current clinical practice and the recommendations set forth in the protocol.

The subdivisions of this section are:

- Priority Aims and Suggested Measures
  - Measurement Specifications
- Key Implementation Recommendations
- Knowledge Resources
- Resources Available
Priority Aims and Suggested Measures

1. Eliminate all falls with injury in the acute care setting.
   Possible measures for accomplishing this aim:
   a. Fall prevalence: rate of inpatient falls per 1,000 patient days.
   b. Fall with injury: rate of inpatient falls with injury per 1,000 patient days.

2. Increase the percentage of patients who are screened by an interdisciplinary team for risk of falls on admission and with a change in clinical status.
   Possible measures for accomplishing this aim:
   a. Percentage of patients screened by an interdisciplinary team.
   b. Percentage of patients receiving a functional performance test.

3. Increase the percentage of patients who receive the appropriate falls prevention interventions.
   Possible measure for accomplishing this aim:
   a. Percentage of patients who receive the appropriate falls prevention interventions based on assessment risk factors.
Measurement Specifications

Possible Success Measurement #1a

Fall prevalence: rate of inpatient falls per 1,000 patient days.

Population Definition

All adult hospitalized patients who fall during their hospital stay.

Data of Interest

Numerator: Total number of inpatient falls within 1,000 patient days
Denominator: 1,000 patient days

Measurement Period

Monthly. Data will be submitted within one month following collection period.
Possible Success Measurement #1b
Fall with injury: rate of inpatient falls with injury per 1,000 patient days.

Population Definition
All adult hospitalized patients who fall and have an injury during their hospital stay.

Data of Interest
Numerator: Total number of inpatient falls with injury within 1,000 patient days
Denominator: 1,000 patient days

Measurement Period
Monthly. Data will be submitted within one month following collection period.
Key Implementation Recommendations

The following system changes were identified by the protocol work group as key strategies for health care systems to incorporate in support of the implementation of this protocol.

1. Organizational leadership needs to identify and support an interdisciplinary falls prevention team comprising clinical and non-clinical staff to oversee the falls prevention program. The team should include at least one provider with a background or additional education in falls prevention.

2. Organizations need a reliable process in place for a comprehensive, interdisciplinary clinical assessment, communication and risk factor intervention plan.

3. Falls prevention education should be provided to patients, families, clinical and non-clinical staff.

4. Organizational leadership needs to support systems that promote learning, ongoing evaluation and improvement of the falls prevention program, including analysis of fall rates and injuries (fall/1,000 patient days and fall with injury/1,000 patient days). The analysis should report on the internal effectiveness (validity) of fall screening and effectiveness of interventions applied to those screened at risk.

Knowledge Resources

Criteria for Selecting Resources

The following resources were selected by the Prevention of Falls (Acute Care) protocol work group as additional resources for providers and/or patients. The following criteria were considered in selecting these resources.

- The site contains information specific to the topic of the protocol.
- The content is supported by evidence-based research.
- The content includes the source/author and contact information.
- The content clearly states revision dates or the date the information was published.
- The content is clear about potential biases, noting conflict of interest and/or disclaimers as appropriate.

Resources Available to ICSI Members Only

ICSI has a wide variety of knowledge resources that are only available to ICSI members (these are indicated with an asterisk in far left-hand column of the Resources Available table). In addition to the resources listed in the table, ICSI members have access to a broad range of materials including tool kits on CQI processes and Rapid Cycling that can be helpful. To obtain copies of these or other Knowledge Resources, go to http://www.icsi.org/knowledge. To access these materials on the Web site you must be logged in as an ICSI member.

The resources in the table on the next page that are not reserved for ICSI members are available to the public free-of-charge.
## Resources Available

<table>
<thead>
<tr>
<th>* Author/Organization</th>
<th>Title/Description</th>
<th>Audience</th>
<th>Web Sites/Order Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>* ICSI members</td>
<td>Fall prevention toolkit – a variety of assessment tools, nursing protocols and care plans developed by ICSI members.</td>
<td>Health Care Providers</td>
<td><a href="http://www.icsi.org/">http://www.icsi.org/</a></td>
</tr>
<tr>
<td>Minnesota Department of Health</td>
<td>Consumer Guide to Adverse Health Events – includes current adverse events information and a guide to learn about questions patient and families should ask to make sure they receive the best care.</td>
<td>Patients and Families</td>
<td><a href="http://www.health.state.mn.us">http://www.health.state.mn.us</a></td>
</tr>
<tr>
<td>Minnesota Safety Council: Minnesota Senior Safe</td>
<td>Resources include falls prevention checklist, home safety checklist, fact sheets on preventing falls, exercise and safety. Includes links to other senior health sites.</td>
<td>Patients and Families</td>
<td><a href="http://www.mnsafetycouncil.org">http://www.mnsafetycouncil.org</a></td>
</tr>
<tr>
<td>The Hospital Elder Life Program (HELP)</td>
<td>Confusion Assessment Method (CAM) – a standardized tool for the detection of delirium.</td>
<td>Health Care Providers</td>
<td><a href="http://elderlife.med.yale.edu">http://elderlife.med.yale.edu</a></td>
</tr>
</tbody>
</table>

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