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INSTITUTE FOR CLINICAL SYSTEMS IMPROVEMENT

Health Care Protocol:

Prevention of Falls (Acute Care)

The information contained in this ICSI Health Care Protocol is intended primarily for health professionals and the following expert audiences:

- 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.

This ICSI Health Care Protocol is designed to assist clinicians by providing an analytical framework for the evaluation and treatment of patients, and is not intended either to replace a clinician's judgment or to establish a protocol for all patients with a particular condition. An ICSI Health Care Protocol rarely will establish the only approach to a problem.

Health Care Protocol:
Prevention of Falls (Acute Care)

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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 adult patients in an acute care setting.

Clinical Highlights and Recommendations

- Best practice results have only been achieved when there is significant organizational support for falls reduction across departments and disciplines. *(Annotation #1; Aims #1, 2)*

- Transparency of falls rates by sharing between hospital units, hospitals and hospital systems or public reporting has a positive effect on falls and injury reduction. *(Annotation #7; Aim #1)*

- Accountability through auditing of compliance with falls risk assessments and interventions has a positive effect on reducing falls rates and injury (consensus of panel members). *(Annotation #7; Aim #1)*

- Best practice in falls reduction includes:

    - falls risk assessment,

    - visual identification of individuals at high risk for falls,

    - falls risk factor directed interventions, and

    - standardized multifactorial education including visual tools for staff, families, and patients. *(Annotations #1, 4, 5; Aims #1, 2)*

- There should be interdisciplinary collaboration on falls prevention at the time of admission between admitting providers having first contact with the patient, including admitting physicians, pharmacists and nurses. *(Annotations #2, 4; Aim #2)*

- Falls risk assessment (regardless of age) should include:

    - a determination through the use of an assessment tool that the patient has fallen in the past year,

    - a functional assessment test – visual observation of the patient's mobility for those not confined to bed rest, and

    - an injury risk assessment.

- Acute care settings should implement a visual identification system for patients at risk of falling. *(Annotation #4; Aim #2)*

- Communication of falls risk across departments and disciplines (including to attending physicians) should be reliable. *(Annotation #4; Aim #2)*

- Multifactorial interventions that increase observation and surveillance have been found to be effective on falls. *(Annotations #5, 6; Aim #2)*

Priority Aims

1. Eliminate all falls with injury through a falls prevention protocol in the acute care setting. *(Annotations #1, 2, 3, 4, 5, 6)*

2. Increase the percentage of patients who receive appropriate falls risk assessment and falls prevention interventions. *(Annotations #2, 6)*

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 composed 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 falls rates and injuries (fall/1,000 patient days and falls with injury/1,000 patient days). The analysis should report on the internal effectiveness (validity) of falls screening and effectiveness of interventions applied to those screened at risk.

Related ICSI Scientific Documents

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.

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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.

For a description of ICSI's development and revision process, please see the Development and Revision Process for Guidelines, Order Sets and Protocols at http://www.icsi.org.

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 falls prevention program – discuss how patient/family can assist with falls prevention and when/how to contact staff when necessary

  - Patient education

- Communicate patient falls risk to all members of the health care team

Perform risk factor interventions *(Annotation #5)*

- Establish universal falls interventions for all patients

- Add strict falls precautions for patients at risk

- Implement behavioral interventions

- Implement impaired mobility interventions

- Perform environmental rounds

Observation and surveillance *(Annotation #6)*

- Monitor at regular intervals – suggest hourly

- Reassess:

  - At shift change

  - If change in clinical status

  - Following a fall

Auditing, continuous learning and improvement *(Annotation #7)*

- Perform safety huddles

- Create action plan for future

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 falls rates in acute care hospitals is far from complete. In 2007 Massachusetts 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. Although the definition of injury was not consistent in this report, injuries from falls were 0.96/1,000 patient days and 0.64/1,000 patient days, respectively, in medical units (patientsfirstma.org).

The National Health Service of the United Kingdom reports an average falls 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])*.

Since this initial protocol was developed in 2008, the panel has reviewed local falls rate data as well as literature reports and found that falls rates and falls injury rates in the range of 1.7-2.7 fall/1,000 patient days are achievable, and that intervals of days without injury or reportable falls are increasing.

The focus has switched to injury prevention rates as falls injury data related to public reporting of fractures, serious injury and death has become available. For the most recent period for which data is available, Massachusetts hospitals had a serious reportable event (SRE) falls rate of 5.53 falls/100,000 patient days, while the rate in Minnesota was 67% lower at 3.32 SRE's/100,000 patient days. The panel is anecdotally aware of a number of injury free intervals of over one year in duration in units of acute care hospitals.

The current Minnesota Adverse Health Care Events Reporting Law requires the reporting of falls for those associated with a serious disability in addition to those associated with a death. In contrast, the reporting of fall rates in Minnesota is on a voluntary basis to the Minnesota Hospital Association, with the information available to other members. Lowering fall rates is associated with a decrease in the injury rate, and voluntary reporting leads to awareness of better performing hospitals in terms of what fall rates are achievable; it may help drive improved performance *(Adverse Health Events in Minnesota, 2009 [NA]; Lancaster, 2007 [D]; Serious Reportable in Massachusetts Acute Care Hospitals [NA])*.

A leading goal of the patient safety movement is the reduction and eventual elimination of falls that result in injury. Therefore, falls 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 falls risk to all departments and disciplines.

In spite of extensive research on falls risk factors and the development of a number of falls 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 falls reduction in acute care hospitals has yielded relatively few randomized trials and achievable benchmarks are far from certain. Falls prevention interventions are complex and multifactorial. Randomized trials are unlikely to be the main source of clinical evidence in this situation *(Oliver, 2006 [M])*. Thus,

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in the area of falls prevention, the best guide to effective strategies is dissemination of the key common elements in better performing falls programs and hospitals. These strategies are then adopted and modified according to the characteristics and abilities of that hospital.

The work group has worked to combine current knowledge of falls risk factors and interventions in the acute care setting into a suggested best-practice protocol. We have also become aware of the roles of auditing for compliance with risk assessments, hourly rounding and interventions as key elements in culture change. When these elements are applied, falls and injury rates tend to be lower; when vigilance or organizational support falters, falls and injury rates tend to climb.

Definitions

Falls: 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. Mandatory reporting of serious injury tends to go into categories 4 or 5. These are reported as serious reportable events/100,000 patient days to facilitate comparisons.

(Commonwealth of Massachusetts Department of Public Health, 2009 [NA]; Lancaster, 2007 [D])

1. Obtain Organizational Support for a Falls Prevention Program

It is clear that application of a falls risk tool or prevention protocol by itself will have little impact on rates of falls and falls with injury. Organizational support for making falls 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 falls reduction rates *(Healey, 2007 [R]; Lancaster, 2007 [D])*.

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

- The organization has an interdisciplinary team in place to oversee the strategic plan for the falls prevention program.

  - The falls prevention program plan is reviewed by the team 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 recommendations from the falls prevention team on equipment and environmental safety.

Education of Falls 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 falls prevention indicators and postfalls protocols for specific organization.

- Education is ongoing and includes brief understanding of the assessment tool and the implications and strategies for falls 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 falls risk prediction can be condensed to three elemental questions:

1. Has the patient fallen in the last year?

2. Does the patient look like he/she is going to fall? In other words, does the patient have a clinically detectable abnormality of gait or balance?

3. Does the patient have an additional risk factor for an injurious fall?

The systematic review *(Ganz, 2007 [M])* of falls 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 falls 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 falls risk on admission and to direct falls prevention resources to those patients.

There is no disagreement that some type of falls risk assessment should occur at patient admission to the acute care hospital. The concept of moving falls risk assessment into the emergency department has also been mentioned as a part of a multifactorial falls prevention protocol *(Lancaster, 2007 [D])* and adopted by some of ICSI's member hospitals.

Standardized Assessment Tool

A number of falls 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 is better than others in falls prediction. In fact, even the best of these tools in terms of sensitivity and specificity underpredicted and overpredicted falls in acute care settings *(Healey, 2007 [R])*. Falls risk assessment instruments by themselves do not prevent falls, but rather only predict them. In addition, many of these tools may take four to seven minutes per patient to complete, 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 falls 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 falls 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 falls risk precautions. A score of 5 or greater is classified as high falls risk. Widespread use and incorporation of the Hendrick II into the electronic medical record has been linked to achievement of falls 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)*.

Since our 2008 revision, the work group has become aware of successful falls reduction programs employing the Hopkins or Morse falls assessments. These are non-proprietary; however, the successful falls reduction programs appear to couple these assessments with a mobility test such as Get Up and Go or additional injury assessment (ABC's).

A comparison of the domains or variables contained within each of these instruments is noted below:

Comparison of the Hendrich, Morse, and Johns Hopkins Tools

Risk Factors for the Morse Tool	Score	Risk Factors for the Hendrich II Tool	Score	Risk Factors for the JHH Tool	Score
History of falls	25		7	Falls history	0-5
Secondary diagnosis	15				
Ambulatory aid	30 or 15			Patient care equipment	0-3
IV/heparin lock	20			IV in patient care equipment	
Gait transferring	20 or 10	Get up and Go test	0-4	Mobility	0-6
Mental status	15	Confusion/disorientation	4	Cognition	0-7
		Altered elimination	1	Elimination	0-4
		Dizziness/vertigo	1	Dizziness mentioned in mobility	
		Depression	2		
		Gender (male)	1		
		Any Anti-epileptics	2	Medications (high-risk drugs)	0-3
		Any benzodiazepines	1	See medications	
				Age	0-3
				Automatic risk factors	Low or high

Regardless of the falls assessment tool selected, internal validation of the instrument within the hospital should occur on a periodic basis *(Healey, 2007 [R])*. It is suggested that this assessment include completing a 2x2 table of falls prediction. 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. In general, a facility's trustee of falls prevention efforts would want to minimize the number of false negatives in screening for falls risk. This would optimize the negative predictive value of negative screens and optimize sensitivity. In addition, other factors such as cost, training, and nursing time to administer the screen should be considered.

Risk category	Fall N (%)	Did not fall N (%)
Assessed as high fall risk		
Not assessed as high fall risk		

The alternative to using a falls 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])*. However, the work group is aware of no published reports of better performance in falls and falls injury rates without using a falls risk assessment instrument.

The Get Up and Go Test and the Timed Get Up and Go Test is available at http://www.fpnotebook.com/Geri/Exam/GtUpAndGTsf.htm

If either of these screening measures suggests increased falls risk, the assessor should determine the modifiable risk factors and identify falls 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 falls risk scores, the Hendrich II has been associated with better performance benchmarks in falls prevention in a major multihospital health care system. Non-proprietary assessments such as the Morse scale or Hopkins scale should be coupled with a mobility test such as a Get Up and Go test, or nursing observation and judgment on the patient's mobility.

- a second stage of assessment for injury risk modifiable (personal) risk factors leading to risk factor specific interventions should be done. These factors include **age, bone, coagulations** and **surgery** (ABC's).

Injury Risk Assessment

- There has been increased focus on assessing each patient's risk for injury, as well as their risk for falling.

- There are certain populations that, if they fell, would be at much greater risk for serious injury.

- The common categories that have been used recently are age (often 85 years old and older), bone (osteoporosis, conditions that are risk factors for osteoporosis, metastases to the bone, etc.), and coagulation (on anticoagulation therapy or bleeding disorder). Another category could include major surgery (surgical wound that could dehisce with a fall). These have been referred to as the ABC's *(Currie, 2004 [M]; Quigley, 2008 [D])*. Additional information available at http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=nursehb&part=ch10.

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. More than 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 or hypoactive, or may 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/fecal 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 are 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.

Dementia

Patients with dementia include those with a diagnosis of Alzheimer's disease, vascular dementia, Lewy-Body dementia, fronto-temporal lobe dementia, and those associated with other disorders. Such patients normally have slower reaction times and demonstrate impaired judgment. In addition, these patients often have impaired mobility, are admitted from nursing homes, have poor baseline functional status and impaired strength, and are at higher risk for significant polypharmacy, all of which are known to place patients at higher risks for falls.

Cognitive impairment has been well established as a risk factor for falls. A recent systematic review demonstrated two studies with likelihood ratios of 17 (1.9-149) and 4.2 (1.9-9.6) *(Ganz, 2007 [M])*. The risk for two or more falls in a 12-month period demonstrated a likelihood ratio of 13 (2.3-79) *(Chu, 2005 [B])*. In one study *(Tinetti, 1995 [B])*, the relative risk of falling for patients with an Mini-Mental Status Exam (MMSE) of less than 20 was 2.6 (95% CI:1.7:4.0). Patients with preexisting cognitive dysfunction often have impaired executive functioning and lose insight, particularly with the inability to differentiate between a safe and unsafe environment.

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 State 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 in the public domain, 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, MMSE and Kokmen Short Test of Mental Status Sources.

Impaired Mobility

Impaired mobility has been identified as being a risk factor for falling. This includes impaired gait, weakness, decreased lower extremity mobility, and decreased coordination and balance. The literature also suggests that patients who fell 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 his or her balance. The higher the score, the more independent the patient *(Berg, 1989 [C]; Mathias, 1986 [C]; Podsiadio, 2000 [C]; Tinetti, 1986 [C])*.

Medications

Many medications have been implicated as risk factors for falls. Elderly people 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 falls 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 people. Bezodiazepines 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]; Rhalimi, 2009 [C])*.

There is an associated risk of falls when patients used zolpidem, meprobamate or calcium channel antagonists. When an alternate medication can be selected, this is advised. It has been demonstrated that use of poly-pharmacy may represent an exposure to medications that increase the probability of falls. Falls risk increases from 25% with one medication to 60% with six or more concurrent medications *(Rhalimi, 2009 [C])*.

Psychotropic medications have about a twofold increased risk of falls and fractures. Similarly there is strong evidence for antidepressants increasing falls 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]; (Rhalimi, 2009 [C]).*

There are different mechanisms by which medications increase the falls 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 bathroom 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.

Further information is located in Resources Available.

Environmental

Physical hazards are often involved in patient falls. An environmental assessment or checklist can often identify modifiable risk factors to falls, such as floor mats, lack of handrails in bathrooms, poorly anchored rugs or clutter *(Agostini, 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.

Patient-specific falls risk status must be identified clearly to alert all staff handling the patient and anyone entering the room. Icons can be very helpful for health care providers to identify what a patient's risks may be, but they need to be communicated by all staff and agreed upon to be effective. Optimizing use of visual cues (i.e., assist of two for transfers, needs assistive device, history of falls) by members of the health care teams to clearly alert all staff of a patient's specific falls risk is important for follow-through and to facilitate immediate recognition/interpretation. When utilizing visual cues, it is important to consider sign fatigue *(Hurley, 2009 [C]).*

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 Falls 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 falls risk upon admission, as risk changes, and upon discharge.

- Describe the organization's falls 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 falls prevention and when/how to contact staff when necessary.

- Document evidence of patient education regarding falls risk, and the patient and family members understanding of the risk and prevention measures.

(Tinetti, 1994 [B])

Patient Education

- Evidence shows that the best falls prevention programs are multifactorial, education being one of those pieces *(Ryu, 2008 [D])*.

- Clinical practice guidelines from the United States and Canada both recommend patient education as a part of falls prevention *(Ryu, 2008 [D])*.

- Multiple teaching methods, in conjunction with each other, create an optimal learning experience for patients *(Ryu, 2008 [D])*.

  - Written

  - Verbal

  - DVD/video *(Hill, 2009 [A])*

  - The use of technology (i.e., DVDs, internal hospital on-demand video system) can help to deliver a consistent message and can help to "modify patients' perceptions, belief and knowledge" *(Hill, 2009 [A])*.

Communication to Members of the Health Care Team Who Come in Contact with the 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. Organizations must implement a standardized approach to hand off communications consistent with The Joint Commission's National Patient Safety Goals. In a hospital, such interactions may occur upon arrival to or from the following patient care areas:

- Radiology

- Procedure rooms

- Surgery

- 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, which is a comprehensive checklist that must be completed and signed before a patient can leave the care unit. Such a checklist should include the falls risk 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's 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 falls risk to all caregivers.

(Agostini, 2001 [R])

Strict falls 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.

- Keep 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 falls rates. However, the literature is contradictory in determining which intervention is most effective. Hospitals generally use multiple interventions to produce their improvement in falls rates *(Barnett, 2002 [R])*.

Exercise reduces the rate of falling in older people. Decreased muscle strength, impaired mobility and gait are some common risk factors that help predict falls. These risk factors can be modified by an exercise program prescribed by a physical therapist *(Sherrrington, 2008 [M])*.

Interventions:

- Patients should wear their shoes or non-skid footwear (some have used red slippers for easy identification by staff)

- Physical therapy and occupational therapy consults for evaluation and possible 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 physical therapy or occupational therapy

- 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

- Use of 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.

An example of environmental rounds can be found at http://www.health.vic.gov.au/qualitycouncil/.

In recent reviews, the authors reported on hip protectors, removal of physical restraints, falls alarm devices and other physical environmental changes.

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

Hip protectors were associated with reduction in hip fracture (ratio 0.67) but not in falls 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 falls precautions *(Healey, 2007 [R])*.

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

Falls alarm devices: One study in a nursing home reported a significant reduction in falls with alarm devices *(Oliver, 2006 [M])*. Associations with falls reduction in hospitals are far less clear. Another recent literature review found only one small hospital study concluding that they were not effective in falls 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 falls 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% falls rate reduction within five months. The average falls rate after bed integration of 2.43 falls/1,000 patient days is on the lowest end of reported falls 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 falls 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.

(Gowdy, 2003 [D])

6. Observation and Surveillance

All patients admitted to acute care need to be monitored and reassessed on a regular basis. Due to the likelihood of ongoing changes, patients should be continuously reassessed even though they may not be in a high-risk falls 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.

Hourly Rounding

Hourly rounding by nurses to monitor for changes in the patient's condition is one strategy that can determine the need for reassessment *(Meade, 2006 [C])*. However, recent literature shows that hourly rounding can be expanded to comfort and safety rounding, as well. Studies have shown that 45.2% of all falls were toileting related *(Tzeng, 2009 [D])*. By implementing hourly rounding and incorporating toileting assistance, hospitals have been able to reduce their falls by 60% in one year *(Meade, 2006 [C]; Quigley, 2008 [D])*. Patient satisfaction and safety have been improved with this concept, and hospital personnel experience less job fatigue and "burnout" with the decreased number of call lights experienced throughout the shift. The nursing professional team shares the responsibility of these rounds and finds that shifts are quieter and more organized, allowing nurses time for charting and patient and family education.

Components of the hourly safety and comfort rounds may include:

- assessment of pain level;
- offering toileting assistance;
- re-positioning and comfort;
- patient belongings, call light, telephone, television remote, urinal, etc. within reach;
- dressing checks;
- water refreshed and offered;
- lighting and temperature of room;
- checking room for environmental and hazardous concerns;
- asking the final question, "Is there anything else I can do for you?" and
- making arrangements for time to return.

These measures are often referred to as The Four P's – position, plan assessment, personal needs, and placement *(Meade, 2006 [C]; Quigley, 2008 [D])*.

Successful implementation of an hourly rounding program revolves around hospital leadership supporting the concept, as well as a strong training program and accountability on every level. Recognition of a successful falls prevention program helps to sustain staff's continued commitment to the program. Posters showing success rates in decreasing numbers of patient falls and days without falls in prominent view for staff, patients, and families gives staff a great sense of pride in a job well done. These types of posters bring the topic of falls prevention into daily conversations and help involve the entire interdisciplinary team in the program. Challenging the staff to build on previous success rates with the promise of unit reward or celebration parties build incentive to continue the satisfying work.

Sitters

Available evidence suggests that sitters contribute little to falls prevention programs. Two studies from Australia had mixed results. In both studies, sitters' hospitals had no patients falls while volunteer sitters were present. However, the overall falls rate of the facility was not decreased in one study *(Donoghue, 2005 [C])* but was reduced 44% in another study *(Giles, 2006 [D])*. Furthermore, an attempt to develop a Patient Attendant Assessment Tool (PAAT) at the University of Michigan *(Tzeng, 2008 [C])* improved the fill/ request rates for sitters, but the rate of falls with injuries was higher. None of these studies described the training or education provided to either volunteer or paid sitters.

Thus, while studies involving sitters suggest a questionable effect on falls rates, studies that involve increased observation and surveillance by nursing appear to have a more consistent positive effect on falls rates.

7. Auditing, Continuous Learning and Improvement

Safety huddles (post-falls huddles) provide a mechanism to learn from falls, near misses or other unexpected events. These immediate assessments of the situation allow a review of the event with the people involved, including family members, and can be done at the bedside. Points included in safety huddles:

- What happened?

- Risk factors

- Injury

- Falls interventions in place at time of fall

- Action plan for future

Corrective actions can be put in place and preventive measures can be instituted for improvement after this exchange *(Quigley, 2008 [D])*. These huddles can be documented and audited for learning opportunities to be shared throughout the interdisciplinary health care team.

Following is a Falls Risk Audit tool used by a major metropolitan hospital:

Falls Risk Audit

EPIC INFORMATION	MR# ROOM:	MR# ROOM:	MR# ROOM:	MR# ROOM:	MR# ROOM:	MR# ROOM:	Percentage
DATE AND TIME OF LAST FALLS SCORE.	Score=	Score=	Score=	Score=	Score=	Score=	
Falls Risk Assessment done within 4 hours of admission/transfer.							
Are appropriate interventions being documented?							
Is there a Falls/Impaired mobility care plan?							
Has Falls Prevention Education been given & documented for patient and or family?							
RISK ALERTS							
Falls Risk sign must be posted near the door and above the HOB if in a double room.							
Green armband?							
Red slippers?							
IS A BED ALARM IN USE? IF SO, IS IT TURNED ON?	Posey= Versa care=	Posey= Versa care=	Posey= Versa care=	Posey= Versa care=	Posey= Versa care=	Posey= Versa care=	
Is Hourly Rounding form being completed?							
Is toileting Schedule indicated?							
Is there documentation that shows the patient is being mobilized?							
Is there documentation that CNS or Pharmacy was consulted?							
Discussion with staff?							
FALLS OCCURANCE							
Is there documentation in EPIC on clinical Doc Flow Sheet, related to the fall?							
Is there documentation indicating alternative strategies have been deployed?							
PERCENTAGES							

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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.

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INSTITUTE FOR CLINICAL
SYSTEMS IMPROVEMENT

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 through a falls prevention protocol in the acute care setting.

    Possible measures for accomplishing this aim:

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

    b. Falls with injury: rate of inpatient falls with injury per 1,000 patient days.

2. Increase the percentage of patients who receive appropriate falls risk assessment and falls prevention interventions.

    Possible measure for accomplishing this aim:

    a. Percentage of patients who receive appropriate falls prevention interventions based upon the results of their falls risk assessment.

Measurement Specifications

Possible Success Measurement #1a

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

Population Definition

All adult hospitalized patients who falls 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

Falls 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 falls rates and injuries (fall/1,000 patient days and falls with injury/1,000 patient days). The analysis should report on the internal effectiveness (validity) of falls 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/improvement_resources. 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

*	Author/Organization	Title/Description	Audience	Web Sites/Order Information
	Department of Veterans Affairs National Center for Patient Safety	National Center for Patient Safety: The Falls Toolkit – includes background information and materials for designing a falls reduction program including the Morse Falls Scale, falls risk assessment, and standard falls prevention interventions.	Health Care Providers	http://www.va.gov/ncps/ safetytopics/fallstoolkit/index.html
	Family Practice Note-book.com	Kokmen Short Test of Mental Status, Mini-Mental State Exam, Get Up and Go Test	Health Care Providers	http://fpnotebook.com/neuro/exam/ kkmnshrttstofmntl.sts.htm
	The Hospital Elder Life Program (HELP)	Includes information on recognizing delirium.	Health Care Providers	http://elderlife.med.yale.edu
*	ICSI members	Falls prevention toolkit – a variety of assessment tools, nursing protocols and care plans developed by ICSI members.	Health Care Providers	http://www.icsi.org/
	The Joint Commission	National Patient Safety Goals contains a chapter on reducing falls in an inpatient setting.	Health Care Providers	http://www.jointcommission.org/ PatientSafety/NationalPatientSafetyGoals
	Minnesota Department of Health	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.	Patients and Families	http://www.health.state.mn.us/ patientsafety
	Minnesota Hospital Association	Information about the SAFE from FALLS call to action. Information includes Morse Falls Scale and John Hopkins Hospital Falls Risk assessment tools, prevention suggestions, and a post-falls huddle form.	Patients and Health Care Providers	http://www.mnhospitals.org
	Minnesota Safety Council: Minnesota Senior Safe	Includes falls prevention checklist, home safety checklist, fact sheets on preventing falls, exercise and safety. Includes links to other senior health sites.	Patients and Families	http://www.mnsafetycouncil.org
	Society of Hospital Medicine	Mini-Cog Assessment Instrument for Dementia. A clock drawing test combined with a 3-item recall test.	Health Care Providers	http://www.hospitalmedicine.org/ geriresource/toolbox/mini_cog.htm

* Available to ICSI members only.

*	Author/Organization	Title/Description	Audience	Web Sites/Order Information
	The Victorian Quality Council Safety and Quality in Health Care State Government of Victoria, Australia	Includes guidelines for acute, sub-acute and residential care settings. Provides a framework (model) and supporting resources for a falls prevention program in hospitals, including environmental rounds, environmental checklists and other tools. Virtual training in falls assessment can be accessed through this Web site.	Health Care Providers	http://www.health.vic.gov.au/ qualitycouncil

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