Falls Prevention/Prevention of Injury from Falls
An Integrative Review of the Evidence

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Integrative Review

• A review via a systematic approach that uses a detailed search strategy to find relevant evidence to answer a targeted clinical question

• Evidence can come from RCTs, observational studies, qualitative research, clinical experts, and other types of evidence

• Does not use summary statistics
Clinical Question

For adults in the acute care setting, what strategies are effective in (a) preventing falls and (b) preventing harm from falls?
Search Methodology

- **Inclusion criteria:** fall prevention, falls, prevention of harm/injury from falls, acute care setting, hospitalized patient population, adult inpatient

- **Exclusion criteria:** evaluation of fall risk assessment tools/instruments; children, pediatric population, acute care nurses experiences, perceived barriers, measuring direct healthcare costs, fracture risk, implementation of clinical guidelines, ambulatory care, community care, home care, skilled nursing facilities, rehabilitation units outside the acute care setting, subacute care units outside the acute care setting, convalescent homes, data sets, DRG weights
# Search Methodology

## Search Results
*(October 18\textsuperscript{th} to November 17\textsuperscript{th}, 2010)*

<table>
<thead>
<tr>
<th>Key Search Terms</th>
<th>AHRQ</th>
<th>Cochrane Library: Cochrane Review</th>
<th>Institute of Healthcare Improvement</th>
<th>Joanna Briggs Institute</th>
<th>KP Clinical Guidelines</th>
<th>Ovid</th>
<th>Proquest (search 1 + Search 2)</th>
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<tr>
<td>Falls, prevention, adult(s), acute care, fall injury</td>
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<td>28</td>
<td>2</td>
<td>10</td>
<td>0</td>
<td>17 (2 duplicates)</td>
<td>32 (10 duplicates)</td>
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<tr>
<td>Key Search Terms</td>
<td>Search Results (October 18th to November 17th, 2010)</td>
<td></td>
<td></td>
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### Evidence Ranking & Leveling

**Canadian Medical Association Evidence Scoring System**  
*(Adapted by KP SCAL Regional Nursing Research Research Program, 2006)*

<table>
<thead>
<tr>
<th>SCORE</th>
<th>LEVELS OF STUDIES</th>
<th>RELEVANT ARTICLES</th>
<th>ARTICLE NUMBER</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>Meta-Analysis of RCTs/Systematic Reviews</td>
<td>4</td>
<td>3,8,12,34</td>
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<tr>
<td>9</td>
<td>Large Sample RCTs</td>
<td>1</td>
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<td>8</td>
<td>Small Sample RCTs</td>
<td>1</td>
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<td>7</td>
<td>Non-random, Controlled Prospective Studies</td>
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<td>21,32</td>
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<td>6</td>
<td>Non-random, Controlled Retrospective Studies</td>
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<td>1</td>
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<tr>
<td>5</td>
<td>Cohort Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Case-Controlled Studies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Non-Controlled, Clinical, Descriptive Studies</td>
<td>10</td>
<td>9,13,17,26,28,37,40,39,41,42</td>
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<td>2</td>
<td>Case Studies</td>
<td>2</td>
<td>2,23</td>
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<tr>
<td>1</td>
<td>Expert Consensus, Manufacturers Recommendations (Literature Reviews)</td>
<td>19</td>
<td>4,5,6,11,14,15,18,19,20,22,24,25,27,29,30,31,33,35,36</td>
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<tr>
<td>0</td>
<td>Anecdotes &amp; *Qualitative Studies</td>
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<td>7,38*</td>
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<td><strong>Total</strong></td>
<td><strong>42</strong></td>
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### Evidence Ranking & Leveling

#### American Association of Critical Care Nurses (AACN) Evidence Leveling System

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>DESCRIPTION</th>
<th>RELEVANT ARTICLES</th>
<th>ARTICLE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Meta-analysis of multiple controlled studies or metasynthesis of qualitative studies with results that consistently support a specific action, intervention, or treatment</td>
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<td></td>
</tr>
<tr>
<td>B</td>
<td>Well-designed controlled studies, both randomized and nonrandomized, with results that consistently support a specific action, intervention, or treatment</td>
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<tr>
<td>C</td>
<td>Qualitative studies, descriptive or correlational studies, integrative reviews, systematic reviews, or randomized controlled trials with inconsistent results</td>
<td>20</td>
<td>1,3,8,9,12,13,16,17,21,24,26,28,32,34,37,38,39,40,41,42</td>
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<tr>
<td>D</td>
<td>Peer-reviewed professional organizational standards, with clinical studies to support recommendations</td>
<td>15</td>
<td>2,5,6,7,14,15,18,19,20,22,29,30,33,35,36</td>
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<tr>
<td>E</td>
<td>Theory-based evidence from expert opinion or multiple case reports</td>
<td>6</td>
<td>4,11,23,25,27,31</td>
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<tr>
<td>M</td>
<td>Manufacturer’s recommendations</td>
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<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>42</strong></td>
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</tbody>
</table>
## Search Methodology

<table>
<thead>
<tr>
<th>Grand Total of Search Results</th>
<th>Relevant Articles for Review</th>
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</thead>
<tbody>
<tr>
<td>131</td>
<td>50</td>
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</tbody>
</table>

Article review by 6 nurses* from November 17, 2010 to January 31, 2011

Total Articles Excluded After Review: 8

Total Relevant Articles Included in Final Review: 42

*Collaborative Center for Integrative Reviews and Evidence Summaries (CCIREN)
Evidence Appraisal

- Strength of evidence evaluated ranged from insufficient to fair.
- Majority of evidence was insufficient (internal standardized KP SCPMG tool).

- Good = 0
- Fair = 6
- Insufficient = 36

Final Grade = Insufficient
Evidence Appraisal

- **Result Limitations**
  - Lack of RCTs
  - Varied & mixed research methodologies with conflicting results
  - Insufficient sample size
  - Multitude of diverse interventions
  - Inability to generalize some research results to the KP patient population
Evidence Results

Executive Summary

- The evidence presented a conceptual framework that can be used to design and implement a strategic falls prevention program ²

- Based on Sentara’s Falls Reduction Conceptual Framework: An Error Management Model ²
Appendix A
Falls Awareness & Prevention Model: An Evidence-Based Framework for Risk Reduction & Management

Adapted from Sentara’s Falls Reduction Conceptual Framework: An Error Management Model (2008); C. Crawford, RN, MSN; Kaiser Permanente SCAL Regional Nursing Research Program, March 2011
Evidence Results

Critical Elements of the Evidence

- Use a collaborative interdisciplinary programmatic approach to design, implement, monitor, and evaluate a falls prevention program 2,4,6,9,17,19,20,23,25,27,29,32,33,36

- Target falls awareness, prevention, and management to patients most at risk for falls/injury from falls via routine and regular assessment and reassessment throughout the hospital stay 2,6,9,15,17,18,20,24,27,29,42
Evidence Results

Critical Elements of the Evidence

- Evidence-based best practice guidelines and protocols should be specific to patient populations.

- Strategically focus on the prevention and/or reduction of falls with injury for patients with repeat/multiple falls and/or patients who are at high risk.

2,3,5,14,18,19,21,27,32,37,41,42
2,5,6,9,18,20,21,24,30,34,37,42
Evidence Results

- Focused on several falls-related areas
  - Prevention strategies 1,2,4-6,33,38,39
  - Risk stratification and identification 2,6,9,20,24,29
  - Risk assessment 2,5,6,9,10,17,24,36,37
  - Risk factor characteristics 2,4-7,12,13, 15,17,24,26,27,30,32-38,41,42
  - Nursing care implications and strategies 2,5,9,14,17-20-22,27, 28,33,36,37-39,42
  - Suggestions for future research 3,5,6,9,10,13,15-17,18,32,33,38,40,41
Clinical expertise, coupled with an evidence-based strategic falls awareness and prevention framework, is needed to ensure the continuation of quality patient care while also reducing falls/injury from falls rates 2,5,10,27.

Professional nurses are integral for the development and implementation of evidence-based practices to prevent falls/injury from falls and improve the outcomes of patients 19,25.
Evidence Results

- To achieve the full impact of a multifaceted falls program, the traditional manner in which interdisciplinary staff thinks about falls may need to be changed \(^{18,29}\)
- Instead of assuming all patients are at risk, regardless of risk factors, staff may need to target individualized interventions for those patients most at risk for falling and injury
- *Careful assessment/reassessment on a regular and routine basis is KEY* \(^{2,9,18,24}\)
Regardless of the design, the success of a falls prevention program depends upon interdisciplinary staff, unit-level management, and senior leadership alignment with the high priority organizational goal of falls prevention 4,6,9,19,33
Evidence Results

- This heightened sense of awareness throughout multiple organizational levels not only assists in the identification of high-risk patients, but also promotes the central mission of protecting patient from falls at all entry points within the Kaiser Permanente healthcare system 14,20,32,36
Evidence Results

The Power of Clinical Judgment

- Multimodal programs have been endorsed by clinical experts as foundational to the design of evidence-based strategies needed to both standardize and individualize patient care with the acute care setting.

2,5,6,9,17-20,23,24,30,33,38

- Strength training, early frequent ambulation, toileting.
Evidence Results

- To date, a ubiquitous fall and injury prevention strategy has not been identified for hospitalized patients 5,6
  - Falls result from a myriad of factors that complicate program evaluation and management 27
  - May reflect the difficulties in introducing multifaceted strategies and interventions within complex clinical environments 5,6
Evidence Results

- Conflicting evidence surrounds the broad topic of (a) falls preventions and (b) prevention of harm/injury from falls. 1-4; 6-10; 12; 14; 18; 24; 25; 28; 36; 38

- Contradictory results may represent the lack of high quality research studies & the difficulty conducting RCTs for this vulnerable patient population 3, 8, 10, 12, 28

- Exercise – Often not defined or adequately described 8
Evidence Results

- Risk factors vary between falls prevention versus prevention of harm/injury from falls
- There is conflicting evidence concerning the specific recommendations for falls prevention strategies and programs
Recommendations

Based on the reviewed evidence, the following recommendations are offered for consideration...
Appendix A
Falls Awareness & Prevention Model:
An Evidence-Based Framework for Risk Reduction & Management

Risk Stratification and Identification
Fall Risk/Injury Risk Assessment Scale
- Admission; every shift; clinical status change
- Visual Indicators of falls
  - Colored socks, blankets, ambulants
  - Room/door/assign. board signage
  - Reminders of hourly rounding

Active Interventions
- Clinical expertise/judgment
- Patient/family involvement
- Rounding & Assessment
- Free & open walking paths
- Call light & other items in reach
- Offer frequent toileting
- Room near nurses station
- Skid resistant slippers
- Gait belts
- Low bed with locked brakes
- Limit restraint/bedrail use
- Sitters
- Avoid sedation use

Disclosure
- Open disclosure & communication with patient & family

Safety Devices
- Hip protectors
- Helmets
- High Impact Floor mats

Initial Response
- Rapid & complete assessment & treatment
- Follow-up monitoring for 48 hrs
- Root Cause Analysis

Alarms/Monitors
- Bed, chair, tab, body

Assist to Floor
- 2, 3, 20

Immediate Response
- 2, 3, 20

Nursing Staff
- Expedite care & communication

Environmental Risks
- Assessment
- Medical devices/equipment
- Restraints
- Furniture arrangement
- Flooring (high gloss, damaged)
- Hazards (spills, cords, steps)
- Geriatric unit
- Unfamiliar environment

Communication
- Between patient, family, & all staff
- Between departments
  - Pre-shift safety huddle
  - Handoffs
  - SBAR
  - Medication review
  - Electronic health record
  - Rounding with checklists
  - Coaching
  - Feedback Loops
  - Post-fall huddle

Reporting
- 2, 1, 2, 20, 23, 25, 29
- Usability testing
- Timely reporting
- Blame-free reporting
- Root Cause Analysis
- Control/Run Charts
- Regular data review
- Staff awareness of data

Education
- 2, 4, 6, 7, 8, 10, 20, 23, 25, 30
- Assessment & reassessment of intrinsic & extrinsic risk factors
- Falls/injury prevention
- Targeted surveillance & awareness
- Environmental risks
- Safe transfers/mobility/falling
- Post fall follow-up
- Teach Back/Show Back, Ask Me 3

Interdisciplinary Collaboration
- 2, 6, 9, 10, 20, 23, 25, 27, 33
- Diverse membership with fall champions
- Teamwork
- Common Goals
- Evidence-based guidelines, protocols & best practices

Multifactorial/Multimodal Falls Program
- Multipronged & Multifaceted evidence-based strategies
- Organizational alignment & support
- Broad communication systems
- Hospital-wide & unit-specific interventions
- Individualized patient population practice changes

STRATEGIC PROGRAMMATIC INFRASTRUCTURE
Assessment, Implementation, Monitoring, & Evaluation Systems
- Quality Improvement & Risk Management

Adapted from Sentara's Falls Reduction Conceptual Framework: An Error Management Model (2008); C. Crawford, RN, MSN; Kaiser Permanente SCAL Regional Nursing Research Program, March 2011
Ensure the strategic programmatic infrastructure of a falls prevention program involves Quality Improvement & Risk Management and include assessment, implementation, monitoring, reporting, and evaluation systems 2,4,11,17,20,29,36
Involve a dedicated interdisciplinary falls prevention team in the multimodal design of multipronged evidence-based strategies, guidelines, and protocols in order to standardize and individualize population-based practice changes

2,5,6,9,17-20,23-25,27,30,33,3
Embed broad communication systems within organizational infrastructures to facilitate the spread of hospital-wide and unit-specific evidence-based improvements to all hospital staff 2,7,9,29
Prevention

- Establish a system for fall risk stratification and identification based upon a falls risk assessment scale used upon admission, every shift, and any clinical status change\textsuperscript{2,6,9,20,24,29}
Prevention

- Educate patient, family, & interdisciplinary staff about high falls risk via tailored education focusing on population-based risk factors, targeted staff surveillance and awareness, and preventative strategies for falls, as well as goal setting

2,4,9,14,18,20,21,23,24,29,30,34,35,37,38,41

- Assessment & reassessment 2,6,9,20,24

- Hourly rounding 2,4

- Toileting 2,4
Prevention

- Combine clinical expertise and judgment with environmental risk assessment and falls interventions, such as visual indicators and hourly rounding, to individualize patient care, target unique patient populations, and prevent/reduce falls. 

1,2,4,7,9,20,24,27,33,36,38,38
Rescue

- Use bed, chair, body, and tab alarms to alert nursing staff for immediate response, quick attendance, and early rescue of patients who have fallen $^2,^3,^20$

- Educate nursing staff to respond to patients who are actively falling by assisting patients safely to the floor and then provide immediate assistance and treatment $^2$
Protection

- Establish open communication and disclosure between patients, family, interdisciplinary staff, and hospital departments about fall injury risk upon admission and throughout the hospital stay.
Protection

- Reduce injury from falls by limiting the use of restraints\(^6\), lowering bed height\(^3,38\), lowering bed rails\(^6\), and via safety devices such as hip protectors\(^2,5,6,30,33,34\), helmets\(^2\), and high impact beveled edge floor mats\(^2\).

- Mats used when patient is in bed; stowed away safely when OOB\(^2\).
Institute an Injury from Falls Initial Response System that includes comprehensive and rapid reassessment, continuous patient monitoring for 48 hours, and root cause analysis 2,6,20,24,27,3
Utilize an evidence-based conceptual framework when designing a comprehensive falls prevention program

Use a collaborative interdisciplinary programmatic approach for all phases of a falls prevention program

2, 4, 6, 9, 17, 19, 20, 23, 25, 27, 33, 36
Establish open lines of communication to actively involve patients & family in falls prevention $^{2,9,24,37}$
Summary & Conclusions

PREVENTION

- Increase nursing vigilance, assessment, and reassessment at any change in clinical status \(^2,37\)

- Incorporate post-fall and environmental risk assessments into routine nursing practice \(^3,9,33\)
Summary & Conclusions

PREVENTION

- Use falls and environmental risk assessment information and clinical judgment to individualize patient care

2,9,18,24
Summary & Conclusions

RESCUE

- Utilize fall risk alarm devices to facilitate early rescue and immediate attendance to patients who have fallen.\(^2,3,20\)
There is a need for an evidence-based risk assessment tool specific to patients who are at high risk of injury from falls \(^6,18,29\).
Summary & Conclusions

RESEARCH OPPORTUNITIES

- Nursing education & change in practice as vital markers for falls prevention
- Falls incidence & prevention
- Falls/injury from falls risk assessment tools
- Falls risk factors
- Repeat/multiple falls
- Toileting issues
An evidence-based falls prevention program fulfills the KP Nursing Vision:

“Advance the art and science of nursing in a patient-centered healing environment through our professional practice and leadership”
Contact Information

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Cecelia.L.Crawford@kp.org
References


References


References


(29) Quigley P, Hahm B, Gibson W et al. Reducing Serious Injury From Falls in Two Veterans' Hospital Medical-Surgical Units. *Journal of Nursing Care Quality* 2009;24:33-41.


References


References


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