Innovations in Fall and Fall-Injury Prevention and Reduction Strategies for Older Adults

Pat Quigley, PhD, MPH, ARNP, CRRN, FAAN, FAANP
Associate Director, VISN 8 Patient Safety Center
Associate Chief for Nursing Service/Research

E-Mail: patricia.quigley@va.gov
http://www.visn8.va.gov/patientsafetycenter/fallsTeam/default.asp
Objectives

- Illustrate Relationship of Complementary Perspectives of Evidence-based Practice
- Translate Actionable Elements of a Fall Prevention Program
- Segment Vulnerable High Risk Populations to Prevent Injury
- Organize 2 strategies to implement and evaluate Evidence-based Practices to Prevent Falls and Reduce Severity of Injury
Integration of Complementary Perspectives

Knowledge → Innovation Diffusion → Knowledge Transfer → Outcome

Knowledge base → Evidence-based Practice
Three Perspectives

Evidence-based Practice (Sackett)
“...the conscientious use of current best evidence in making decisions about the care of individual patients or the delivery of health services.”

Innovation Diffusion (Rogers)
The process of communicating new ideas through certain channels over time among members of a social system.

Knowledge Transfer (Dixon)
Sharing of common knowledge, that is the knowledge that employees learn from doing the organization’s tasks.
Overview

1. Differentiate Prevention vs. Protection
2. Brief description of our Patient Safety Research Center
3. State of Science related to patient falls
4. Why we have not “cracked the code” for preventing patient falls
5. New and Emerging Research on patient falls
Prevention

- The act of preventing, forstalling, or hindering
Protection

- Shield from exposure, injury or destruction (death)
- Mitigate or make less severe the exposure, injury or destruction
Clinical trial to test interventions

Review Research, Clinical and Laboratory Information

Is evidence strong enough to warrant practice change?

Yes

Implement evidence-based practice

No

Does evidence support clinical trials?

Yes

Clinical trial to test interventions

No

Epidemiological study to identify modifiable risk factors for adverse events or descriptive studies to understand process and outcomes

OR

Equipment design or redesign

Technology Transfer

Is equipment ready for Market?

Yes
<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level I</td>
<td>Meta-Analysis (Combination of data from many studies)</td>
</tr>
<tr>
<td>Level II</td>
<td>Experimental Designs (Randomized Control Trials)</td>
</tr>
<tr>
<td>Level III</td>
<td>Well designed Quasi Experimental Designs (Not randomized or no control group)</td>
</tr>
<tr>
<td>Level IV</td>
<td>Well designed Non-Experimental Designs (Descriptive-can include qualitative)</td>
</tr>
<tr>
<td>Level V</td>
<td>Case reports/clinical expertise</td>
</tr>
<tr>
<td>A</td>
<td>Strongly recommended; Good evidence</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>B</td>
<td>Recommended; At least fair evidence</td>
</tr>
<tr>
<td>C</td>
<td>No recommendation; Balance of benefits and harms too close to justify a recommendation</td>
</tr>
<tr>
<td>D</td>
<td>Recommend against; Fair evidence is ineffective or harm outweighs the benefit</td>
</tr>
<tr>
<td>I</td>
<td>Insufficient evidence; Evidence is lacking or of poor quality, benefit and harms cannot be determined</td>
</tr>
</tbody>
</table>
Role of RCTs

- Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials
- Gordon C S Smith, Jill P Pell
- BMJ 2003;327
Would you or not?
Who dies if they fall?

- Very young and very old
Limits to Science

- Failure to Differentiate Type of Fall
  - Accidental
  - Anticipated Physiological
  - Unanticipated Physiological (Morse 1997)
  - Intentional Falls

- Failure to Link Assessment with Intervention
Where are we?

BEST PRACTICES:

LEVEL OF EVIDENCE
What is Known: Tried and True

The BEST (most effective) fall prevention programs are multifactorial and interdisciplinary (AHRQ I-II, USPSTF A):

LTC

Ambulatory Care – AGS Guidelines, 2010

Source of Policy for JCAHO Fall Program Guidance 2007
Ambulatory Care

- AGS, BGS Clinical Practice Guidelines 2010:

- Assessment
- Interventions
- Evidence Grades
- Bibliography

- www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2010
1. Obtain relevant medical history, physical examination, cognitive and functional assessment
2. Determine multifactorial fall risk:
   a. History of falls
   b. Medications
   c. Gait, balance, and mobility
   d. Visual acuity
   e. Other neurological impairments
   f. Muscle strength
   g. Heart rate and rhythm
   h. Postural hypotension
   i. Feet and footwear
   j. Environmental hazards

Interventions

Initiate multifactorial/multicomponent intervention to address identified risk(s) and prevent falls:

1. Minimize medications
2. Provide individually tailored exercise program
3. Treat vision impairment (including cataract)
4. Manage postural hypotension
5. Manage heart rate and rhythm abnormalities
6. Supplement vitamin D
7. Manage foot and footwear problems
8. Modify the home environment
9. Provide education and information
Must Reads:

- Clinics in Geriatric Medicine, Nov. 2010.


- 30% to 51% of falls result with some injury
- 80% - 90% are unwitnessed
- 50%-70% occur from bed, bedside chair (suboptimal height), or transferring between the two; whereas in mental health units, falls occur while walking
- Risk Factors: Recent fall, muscle weakness, behavioral disturbance, agitation, confusion, urinary incontinence and frequency; prescription of “culprit drugs”; postural hypotension or syncope
Most effective, fall prevention interventions should be targeted at both point of care and strategic levels

- Best Practice Approach in Hospitals:
  - Implementation of safer environment of care for the whole patient cohort (flooring, lighting, observation, threats to mobilizing, signposting, personal aids and possessions, furniture, footwear)
  - Identification of specific modifiable fall risk factors
  - Implementation of interventions targeting those risk factors so as to prevent falls
  - Interventions to reduce risk of injury to those people who do fall

  (Oliver, et al., 2010, p. 685)
Who is not at risk for falls and harm?

- Risk Screening
- Risk Assessment
- Differential Diagnosis
- Range of Severity
Accident Theory
Differentiate Screening from Assessment

- **Screening**
  - Disease Detection
  - Who should undergo diagnostic testing for confirmation - Cut off point to be negative or positive

- **Assessment**
  - Data for differential Diagnosis
### Morse Fall Scale  (Morse, 1997, *Preventing patient falls.*)

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Scale</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of Falls</td>
<td>Yes</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Secondary Diagnosis</td>
<td>Yes</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Ambulatory Aid</td>
<td>Furniture</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Crutches / Cane /</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>None / Bed Rest / Wheel Chair / Nurse</td>
<td>0</td>
</tr>
<tr>
<td>IV / Heparin Lock</td>
<td>Yes</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>Gait / Transferring</td>
<td>Impaired</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>Weak</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>/ Bed Rest / Immobile</td>
<td>0</td>
</tr>
<tr>
<td>Mental Status</td>
<td>Forgets Limitations</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Oriented to Own Ability</td>
<td>0</td>
</tr>
</tbody>
</table>
Screening to Assessment

- History of Falls
  - Screen: yes or no
  - Assessment: based on positive or negative screen response

- Assessment must be comprehensive
- Required for rest of nursing process
Other Risk Factors

Other risks (choose 1 or more)

- History of falling (if 'yes' response to Morse Fall Scale Q1)

Answer both questions

1. Obtain additional fall history:
   - contributing factors to falls
   - frequency of falls in the last three months
   - any other pertinent history

   Fall History:
   *

2. Did patient/resident have a history of injury with prior falls?
   - No
   - Yes - Injury with Fracture
   - Yes - Injury without Fracture
   - Unknown history of injury or injuries

Secondary Diagnosis (if 'yes' response to Morse Fall Scale Q2)

Neither of the above (no history of falling and no secondary diagnosis)
What About?

- The 85 yo who says No to a history of recent falls?
- The patient who gets admitted because of a fall?
- The patient who falls in our care?
In-Patient Settings: Prevent Falls and Protect from Injury

- What is Risk Assessment?
- Universal Fall Precautions
- Segment Populations by Risk
- Patient Centered Care: Health Literacy Actions
- Intervene on Modifiable Intrinsic Risk Factors
- Intervene on Modifiable Extrinsic Risk Factors
- Multi-disciplinary Care Planning
- Rapid Response Team (Nursing or Multidisciplinary)
- Special Emphasis Populations (Cognitively Impaired, >75 yoa, Radiation Treatment, Newly Disabled, who else?)
- Risk for Injury
Interventions

1. Basic preventive and universal falls precautions for all patients
2. Assessment of all patients for risk of falling and sustaining injuries from a fall in the hospital
3. Cultural infrastructure
4. Hospital protocols for those identified at risk of falling
5. Enhanced communication of risk of injury from a fall
6. Customized interventions for those identified at risk of injury from a fall
Protect from Injury
Protecting Patients from Harm – Our Moral Imperative
Moderate to Serious Injury

- Those that limit function, independence, survival
- Age
- Bones (fractures)
- Bleeds (hemorrhagic injury)
- Surgery (post operative)
## Fall Prevention and Injury Reduction Matrix
(Assumes Universal Falls Prevention Implemented)

<table>
<thead>
<tr>
<th>RISK OF FALL</th>
<th>+ RISK FALL/-- RISK INJURY</th>
<th>+ RISK FALL/+ RISK INJURY</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>Implement fall reduction interventions</td>
<td>Implement fall reduction interventions</td>
</tr>
<tr>
<td></td>
<td>Assess, intervene and communicate if <em>injury risk</em> changes</td>
<td>Implement injury prevention interventions</td>
</tr>
<tr>
<td>--</td>
<td>Implement fall reduction interventions</td>
<td>--RISK FALL/+RISK OF INJURY</td>
</tr>
<tr>
<td></td>
<td>Assess, intervene and communicate if <em>fall risk or injury risk</em> changes</td>
<td>Implement injury prevention interventions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess, intervene and communicate if <em>fall risk</em> changes</td>
</tr>
<tr>
<td>--</td>
<td></td>
<td>--RISK FALL/--RISK INJURY</td>
</tr>
<tr>
<td>--</td>
<td>--RISK FALL/--RISK INJURY</td>
<td>--RISK FALL/+RISK OF INJURY</td>
</tr>
</tbody>
</table>

---

**RISK OF INJURY FROM A FALL**

---

+
Universal Injury Prevention

- Educates patients / families / staff
  - Remember 60% of falls happen at home, 30% in the community, and 10% as inpts.
  - Take opportunity to teach
- Remove sources of potential laceration
  - Sharp edges (furniture)
- Reduce potential trauma impact
  - Use protective barriers (hip protectors, floor mats)
- Use multifactorial approach: COMBINE Interventions
- Hourly Patient Rounds (comfort, safety, pain)
- Examine Environment (safe exit side)
Age: > 85 years old

- Education: Teach Back Strategies
- Assistive Devices within reach
- Hip Protectors
- Floor Mats
- Height Adjustable Beds (low when resting only, raise up bed for transfer)
- Safe Exit Side
- Medication Review
Bones

- Hip Protectors
- Low Beds
- Floor Mats
- Evaluation of Osteoporosis
Bleeds

- Evaluate Use of Anticoagulation: Risk for DVT/Embolic Stroke or Fall-related Hemorrhage
- Patient Education
- TBI and Anticoagulation: Helmets
- Wheelchair Users: Anti-tippers
Surgical Patients

- **Pre-op Education:**
  - Call, Don’t Fall
  - Call Lights

- **Post-op Education**

- **Pain Medication:**
  - Offer elimination prior to pain medication

- **Increase Frequency of Rounds**
Safety Huddles

- Post Fall Analysis
  - What was different this time?
  - When
  - How
  - Why
  - Prevention: Protective Action Steps to Redesign the Plan of Care
Health Literacy

How many patients understand what we tell them or give them to read? According to the research, about 52%

Health Literacy Definition: The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.

(Ratzan and Parker, 2000)

IOM Report: Health Literacy: A Prescription to End Confusion 2004
healthliteracy@ama-assn.org
“Teach Back”

“Teach Back” Testing: what are the trends in patients’ difficulty to understand what is taught?

Ask the patient to describe or repeat back in his or her own words what has just been told or taught. Use return demonstration.
Biomechanics of Fall-Related Injuries

Understanding the “rate of splat” and its impact on injury
Summary of Results

Feet First Fall from Bed

- No Floor Mat fall over top of bedrails: ~40% chance of severe head injury
- No Floor Mat, low bed (No Bedrails): ~25% chance of severe head injury
- Low bed with a Floor Mat: ~1% chance of severe head injury
Bedside Mats – Fall Cushions

- CARE Pad
- NOA Floor Mat
- Posey Floor Cushion
- Tri-fold bedside mat
- Roll-on bedside mat
- Soft Fall bedside mat
Technology Resource Guide: Bedside Floor Mats

- Bedside floor mats protect patients from injuries associated with bed-related falls.
- Targeted for VA providers, this web-based guidebook will include: searchable inventory, evaluation of selected features, and cost.
Hip Protectors – Examples

Safehip

KPH

CuraMedica

HipGuard

HIPS
Hip Protector Toolkit

- This web-based toolkit will include:
  - prescribing guidelines
  - standardized CPRS orders
  - selection of brands and models
  - sizing guidelines
  - protocol for replacement
  - policy template
  - laundering procedure
  - stocking procedure
  - monitoring tools
  - patient education materials
  - provider education materials
Assistive technology for safe mobility-Bed & Chair Monitors

AirPro Alarm
Locator Alarm
Bed & Chair Alarm
Chair Sentry

Economy Pad Alarm
Floor Mat Monitor
Keep Safe
QualCare Alarm
Safe-T Mate Alarmed Seatbelt
Wheelchair-Related Falls

- Current Fall-Risk Assessment tools not effective
- Features of Wheelchairs contribute to risk
- Most common site of injury is NOT hip, but rather fractures of extremities
- Head injury/mortality
Evaluations Methods

- Prevalence Studies
- Formative and Summative Evaluation Methods
  - Type of Falls
  - Severity of Injury
  - Repeat Falls
  - Survival Analysis
  - Annotated Run Charts
What to do When you Fall...
Testing on a *Small Scale*

- Remember to actually try out new ideas before implementing them.
- Break-down New Changes into a series of small tests - that you will study and modify if needed.
- **No** important change will “fit” your system perfectly.
- You want to “work out the bugs” in the new change before you implement it.
Pat And Her Mom

Getting ready to dance
Questions?