Applying Systems Thinking to Fall Risk Reduction

Heartland Health Alliance QI Task Force
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Katherine J. Jones, PT, PhD; UNMC
kjonesj@unmc.edu
Disclosure

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Objectives

1. Identify the fall risk assessment tool with the highest predictive values in your setting

2. Apply systems thinking to change strategies
   a. Address barriers to change
   b. Advantages of successful implementation

3. Review Gap Analyses—What do the most effective teams do?

4. Share fall rate benchmarks
Obj. 1

Identify the fall risk assessment tool with the highest predictive values in your setting
“Rights” of Fall Risk Reduction

Right …
1. Frame of Reference…multiple sources of risk
2. Team
3. Coordination of Program
4. Training
5. Risk Assessment
6. Event Reporting/Learning System
7. Interventions
8. Response to a fall…Post-Fall Huddle
Which is the best tool?

- The one that best predicts who will fall and who will NOT fall

<table>
<thead>
<tr>
<th>Tool (Cut Point)</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>+ Predictive Value</th>
<th>- Predictive Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Johns Hopkins (6+)</td>
<td>100%</td>
<td>0%</td>
<td>41%</td>
<td>0%</td>
</tr>
<tr>
<td>Johns Hopkins (13+)</td>
<td>89%</td>
<td>41%</td>
<td>51%</td>
<td>83%</td>
</tr>
<tr>
<td>Morse (45+)</td>
<td>100%</td>
<td>24%</td>
<td>48%</td>
<td>100%</td>
</tr>
<tr>
<td>Morse (75+)</td>
<td>50%</td>
<td>70%</td>
<td>54%</td>
<td>67%</td>
</tr>
<tr>
<td>FRASS (8+)</td>
<td>100%</td>
<td>24%</td>
<td>48%</td>
<td>100%</td>
</tr>
<tr>
<td>FRASS (15+)</td>
<td>65%</td>
<td>78%</td>
<td>68%</td>
<td>76%</td>
</tr>
</tbody>
</table>
## Comparing Results

### Pender Schmid Fall Risk

<table>
<thead>
<tr>
<th>Did the patient Fall?</th>
<th>Total</th>
<th>Sensitivity</th>
<th>False Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>No Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive result</td>
<td>10 7 17</td>
<td>91%</td>
<td>41%</td>
</tr>
<tr>
<td>negative result</td>
<td>1 4 5</td>
<td>36%</td>
<td>59%</td>
</tr>
<tr>
<td></td>
<td>11 11 22</td>
<td>PV+</td>
<td>80%</td>
</tr>
</tbody>
</table>

- **High Risk**: 3 or higher
- **Low Risk**: 2 or less

### Pender FRASS

<table>
<thead>
<tr>
<th>Did the patient Fall?</th>
<th>Total</th>
<th>Sensitivity</th>
<th>False Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>No Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive result</td>
<td>7 2 9</td>
<td>64%</td>
<td>22%</td>
</tr>
<tr>
<td>negative result</td>
<td>4 9 13</td>
<td>82%</td>
<td>78%</td>
</tr>
<tr>
<td></td>
<td>11 11 22</td>
<td>PV+</td>
<td>69%</td>
</tr>
</tbody>
</table>

- **Positive result = 15 or higher**
- **negative result = 14 or less**

### Fall No Fall

<table>
<thead>
<tr>
<th>Did the patient Fall?</th>
<th>Total</th>
<th>Sensitivity</th>
<th>False Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>No Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>positive result</td>
<td>11 2 13</td>
<td>100%</td>
<td>15%</td>
</tr>
<tr>
<td>negative result</td>
<td>0 9 9</td>
<td>82%</td>
<td>85%</td>
</tr>
<tr>
<td></td>
<td>11 11 22</td>
<td>PV+</td>
<td>100%</td>
</tr>
</tbody>
</table>

- **Positive result = 8 or higher**
- **negative result = 7 or less**
## Linking Risk Factors to Interventions

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Suggested Targeted Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (65-79) and 80+</td>
<td>• Hourly rounding</td>
</tr>
<tr>
<td></td>
<td>• Be aware—potential increased risk for injury due to frailty (skin tears, osteoporosis)</td>
</tr>
<tr>
<td>History Previous Fall</td>
<td>• Refer for PT evaluation (automatic standing order if patient admitted due to a fall)</td>
</tr>
<tr>
<td></td>
<td>• Evaluate any assistive device for appropriateness/fit</td>
</tr>
<tr>
<td>Impaired Cognition/Orientation</td>
<td>• Hourly rounding</td>
</tr>
<tr>
<td></td>
<td>• Bed/chair pressure alarms (Tabs alarms too easily removed)</td>
</tr>
<tr>
<td></td>
<td>• Toileting schedule</td>
</tr>
<tr>
<td></td>
<td>• Do not leave alone in bathroom</td>
</tr>
<tr>
<td></td>
<td>• Low-low bed</td>
</tr>
<tr>
<td></td>
<td>• Move close to nurse’s station</td>
</tr>
<tr>
<td></td>
<td>• Educate family members about patient’s specific risk factors</td>
</tr>
<tr>
<td></td>
<td>• Encourage family members to stay with patient</td>
</tr>
<tr>
<td></td>
<td>• Family/visitors inform nursing when they leave</td>
</tr>
</tbody>
</table>
### Linking Risk Factors to Interventions

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Suggested Targeted Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altered Elimination</td>
<td>• Toileting schedule</td>
</tr>
<tr>
<td></td>
<td>• Commode with drop arm next to bed</td>
</tr>
<tr>
<td>Sensory Impairment</td>
<td>• Unclutter environment</td>
</tr>
<tr>
<td></td>
<td>• Orient patient to environment</td>
</tr>
<tr>
<td></td>
<td>• Ensure adequate lighting</td>
</tr>
<tr>
<td></td>
<td>• Wear glasses, hearing aids as appropriate</td>
</tr>
<tr>
<td>Impaired Activity (i.e. needs assist with gait and transfers)</td>
<td>• Refer for PT and OT evaluation as appropriate</td>
</tr>
<tr>
<td></td>
<td>• Assess for appropriate footwear</td>
</tr>
<tr>
<td></td>
<td>• Keep assistive devices within reach (even if patient is not to get up without assist)</td>
</tr>
<tr>
<td></td>
<td>• Assess patient’s posture when seated in bedside chair (i.e. are they prone to slide out because feet don’t reach floor, is it too difficult to put foot rest down)</td>
</tr>
<tr>
<td></td>
<td>• Document transfer/gait assistance on whiteboard</td>
</tr>
<tr>
<td>Medications</td>
<td>• Request medication review by pharmacist to determine appropriateness of opioids/sedatives</td>
</tr>
<tr>
<td></td>
<td>• Monitor for orthostatic hypotension as appropriate</td>
</tr>
</tbody>
</table>
## Compare Fall Risk Assessments

<table>
<thead>
<tr>
<th></th>
<th>FRASS*</th>
<th>Johns Hopkins*</th>
<th>Marian Joy**</th>
<th>Morse*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>History or Previous Fall</td>
<td>6 mo</td>
<td>6 mo</td>
<td>3 mo</td>
<td>3 mo</td>
</tr>
<tr>
<td><strong>Cognition/ Orientation</strong></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Emotional Status/Impulsive</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paresis</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Communication Deficit</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Toileting/ Altered B B</strong></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Sensory Impairment</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Assistance Needed for Amb/</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Transfers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulatory Aid</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Medications</strong></td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>IV/ Heparin Lock</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Equipment that Tethers Pt.</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Link Interventions to Risk</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Factors</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Validated in acute setting  **Validated in acute rehabilitation setting
Obj. 2

Apply systems thinking to change strategies
Instruments to Assess Risk

Fall Risk System Environment Patient Environment

Individual General System

CAPTURE Falls

Gap Analysis

Fall Risk
Structured Approach to Change: Implementation Science

Technical and social/adaptive processes intended to get an intervention into use within an organization.

Transition period during which stakeholders continuously increase their skill, consistency, and commitment to the use of an intervention.

Linkage between an organization’s decision to adopt an intervention and its routine use.

- Gap Analysis
- Systems Thinking
- Theoretical Frameworks

(Conklin, 2005; Damschroder et al., 2009; Implementation Guide; 2009; Pronovost et al., 2009)
Two Basic Type of Frameworks

1. Prescriptive—how to plan and organize a strategy to implement the intervention
2. Explanatory—how and why it will work

<table>
<thead>
<tr>
<th>Prescriptive Theory</th>
<th>Explanatory Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Strategy</td>
<td>Targeted Intervention Change</td>
</tr>
<tr>
<td>How to plan, organize, and schedule implementation of the innovation/ change/ intervention</td>
<td>Implementation Effectiveness</td>
</tr>
<tr>
<td>How and why the innovation/ change/ intervention will lead to desired change in individual or population health</td>
<td>Outcomes</td>
</tr>
</tbody>
</table>

(Implementation Guide, 2013)
Prescriptive: Rogers’ Organization Innovation Process (Rogers, 2003)

INITIATION

- Agenda Setting/Need
  - Identify need for innovation (diagnose performance gap)

DECISION

- Matching
  - Design innovation to address need and bridge gap

- Restructuring
  - Restructure organization to fit innovation

IMPLEMENTATION

- Clarifying
  - Clarify roles and tasks associated with innovation

- Routinizing
  - Hard-wire: audits, policies, procedures, job descriptions, performance appraisals
**Prescriptive: Rogers’ Individual Innovation Process** *(Rogers, 2003)*

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Persuasion</th>
<th>Decision</th>
<th>Implementation</th>
<th>Confirmation</th>
</tr>
</thead>
</table>
| • Awareness — it exists  
• How-to  
• Principles — how it works | • Relative advantage  
• Compatibility  
• Complexity  
• Trialability  
• Observability | • Adopt  
• Reject | Restructure: Modification to fit an existing environment | • Recognize benefits  
• Make it routine  
• Promote it to others |

*(Rogers, 2003; pp. 169, 421)*
Prescriptive: Rogers’ Organization Innovation Process (Rogers, 2003)

- **INITIATION**
  - Agenda Setting/Need

- **DECISION**
  - Innovation better than old way
  - Resource availability

- **IMPLEMENTATION**
  - Management Support
  - Champions

- **Routinizing**
  - Matching
  - Restructuring
  - Clarifying

Diagram shows the flow of processes:
- Agenda Setting/Need leads to Matching
- Matching leads to Restructuring
- Restructuring leads to Clarifying
- Clarifying leads to Routinizing
- Innovation better than old way and Resource availability lead to Management Support and Champions, which support the processes.
Explanatory: Why it works

Donabedian...Original Systems Thinker

Structure → Process → Outcome

How care is delivered, organized, financed
People, equipment, policies/procedures
Equivalent to system design, capacity for work

Tasks performed that are intended to produce an outcome
Most closely related to outcomes
Causal relationship between process & outcomes

“Ultimate Validator”
Changes in individuals and populations due to health care
Time to develop, multifactorial, random component

(Donabedian, 2003)
Explanatory: Why it works

**Structure**
1. Interprofessional Coordinating Team leads a Multi-team system
2. Risk Assessment Instruments
3. Reporting/Learning System

**Process**
1. Coordinate processes
   - Plan
   - Standardize
   - Adjust

2. Conduct Training

**Outcome (Fall Risk)**
1. Total Fall Rate
2. Unassisted Fall Rate
3. Injurious Fall Rate
4. Repeat Fall Rate
5. Reporting Falls
Apply Frameworks... Barriers to changing tool?

- **Organizational barriers?**
  - Restructure
  - Clarify roles
  - Routinize

- **Individual barriers?**
  - Knowledge
  - Persuasion
  - Decision
  - Implementation
  - Confirmation

- **Facilitators?**
  - Management support
  - Resources
  - Champions

- Fit with EMR?
- Conduct training
- Change policy/procedure
- Clarify nurse role in choosing interventions
Summary…Better than Old Way?

1. Staff is educated about patient source of fall risk
2. Staff have shared mental model of how to match interventions to specific risk factors (not the score)
3. Standardization is foundation for accountability and communication between staff, between staff and patient, and across shifts
Obj. 3

Review Gap Analyses—What do the most effective teams do?
Coordinating Team Processes

- Inform front-line staff about actions taken to improve systems as a result of reported falls
- Integrate evidence from multiple disciplines to improve fall risk reduction
- Modify fall-risk-reduction policies and procedures based on fall-related outcomes
- Select fall-risk assessment tool(s)
- Communicate fall-risk-reduction program barriers and successes to senior leaders
- Link targeted interventions to identified fall-risk factors
- Analyze data regarding fall-risk-reduction program outcomes
- Collect data regarding fall-risk-reduction program outcomes
- Educate staff to use fall-risk assessment tool
- Select interventions to reduce risk of falls
- Educate staff about fall-risk-reduction policies/procedures
- Create fall-risk-reduction policies/procedures
- Educate staff to report all falls (Unassisted & Assisted)
- Educate staff to implement targeted fall-risk-reduction interventions
- Educate staff about outcomes of fall-risk-reduction program
- Select/Develop/Revise Fall Reporting Form
- Conduct audits of fall-risk-reduction interventions to monitor adherence
- Share fall-risk-reduction program and outcomes with hospital board members
- Conduct or participate in individual root cause analysis of injurious falls
- Communicate results of audits of fall-risk-reduction interventions to staff
- Conduct or participate in aggregate root cause analysis of multiple falls
2014 Mean Fall Rates for 16 Nebraska CAHs in CAPTURE Falls

<table>
<thead>
<tr>
<th></th>
<th>Total Falls/1000 Pt. Days</th>
<th>Unassisted Falls/1000 Pt. Days</th>
<th>Injurious Falls/1000s Pt. Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014 Mean</td>
<td>4.5</td>
<td>3.7</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Obj. 4 Share Benchmarks

2014 Fall Rates for 16 Nebraska CAHs by Effectiveness of Fall Risk Reduction Team
Questions
References


Eccles MP, Mittman BS. Welcome to implementation science. Implementation Science. 2006. 1:1-3


Tool References


2. Johns Hopkins tool is copyrighted. Contact: Stephanie S. Poe, spoe@jhmi.edu


5. Morse Fall Scale is freely available at https://www.ahrq.gov/professionals/systems/hospital/fallpxtoolkit/fallpxtk-tool3h.html


7. Contact Jenny Cook for permission to use, email J.Cook2@cgmc.org.au
CAPTURE Falls

Collaboration and Proactive Teamwork Used to Reduce

http://unmc.edu/patient-safety/capture_falls.htm