Managing the Complexity of Patient Safety Problems using Multiteam Systems

Nebraska Coalition for Patient Safety
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Katherine J. Jones, PT, PhD; UNMC
kjonesj@unmc.edu
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Research Team

University of Nebraska Medical Center

- Katherine Jones, PT, PhD
- Victoria Kennel, PhD
- Anne Skinner, RHIA, MS
- Dawn Venema, PT, PhD
- Jane Potter, MD
- Linda Sobeski, PharmD
- Robin High, MBA, MA
- Kristen Topliff, DPT
- Caleb Schantz, DPT
- Mary Wood
- Fran Higgins, MA, ADWR

University of Nebraska-Omaha

- Roni Reiter-Palmon, PhD
- Joseph Allen, PhD
- John Crowe, MA

Nebraska Medicine

- Regina Nailon, RN, PhD

Methodist Hospital

- Deborah Conley, MSN, APRN-CNS, GCNS-BC, FNGNA
Objectives

1. Explain why teams are better able to manage complex patient safety problems than individuals

2. Describe the three major component teams of a fall risk reduction multiteam system

3. Relate five fall risk reduction outcomes to the coordination and training processes conducted by an interprofessional fall risk reduction team
Objective 1.

Explain why teams are better able to manage complex patient safety problems than individuals.
Why Teams?

“Wicked” problems exist...

Harm to Patients

(Reason, 1997)
Why do patients fall?

System and Environment Factors

http://quotesgram.com/patient-rounding-quotes/

http://2.bp.blogspot.com/-2cYcmSYHrW0/T1euBp-CWzI/AAAAAAAABvw/LCsQLvxPh4U/w1200-h630-p-nu/Beers+Criteria.jpg

https://www.acep.org/content.aspx?id=104618
Why do patients fall?

Patient Factors

Table 1. Results of Univariate Analysis* of Most Common Risk Factors for Falls Identified in 16 Studies* That Examined Risk Factors

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Significant/Total†</th>
<th>Mean RR-OR‡</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle weakness</td>
<td>10/11</td>
<td>4.4</td>
<td>1.5–10.3</td>
</tr>
<tr>
<td>History of falls</td>
<td>12/13</td>
<td>3.0</td>
<td>1.7–7.0</td>
</tr>
<tr>
<td>Gait deficit</td>
<td>10/12</td>
<td>2.9</td>
<td>1.3–5.6</td>
</tr>
<tr>
<td>Balance deficit</td>
<td>8/11</td>
<td>2.9</td>
<td>1.6–5.4</td>
</tr>
<tr>
<td>Use assistive device</td>
<td>8/8</td>
<td>2.6</td>
<td>1.2–4.6</td>
</tr>
<tr>
<td>Visual deficit</td>
<td>6/12</td>
<td>2.5</td>
<td>1.6–3.5</td>
</tr>
<tr>
<td>Arthritis</td>
<td>3/7</td>
<td>2.4</td>
<td>1.9–2.9</td>
</tr>
<tr>
<td>Impaired ADL</td>
<td>8/9</td>
<td>2.3</td>
<td>1.5–3.1</td>
</tr>
<tr>
<td>Depression</td>
<td>3/6</td>
<td>2.2</td>
<td>1.7–2.5</td>
</tr>
<tr>
<td>Cognitive impairment</td>
<td>4/11</td>
<td>1.8</td>
<td>1.0–2.3</td>
</tr>
<tr>
<td>Age &gt;80 years</td>
<td>5/8</td>
<td>1.7</td>
<td>1.1–2.5</td>
</tr>
</tbody>
</table>

(Oliver et al., 2004)
Three Sources of Fall Risk

- Environment
- Patient
- System

Individual General

Fall Risk Assessment

CAPTURE Falls Gap Analysis

Fall Risk
## Three Sources of Fall Risk

<table>
<thead>
<tr>
<th>Patient</th>
<th>Environment</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle Weakness</td>
<td>Clutter/Tripping</td>
<td>Attitude: falls inevitable</td>
</tr>
<tr>
<td>History of Falls</td>
<td>Entrapment (4 rails)</td>
<td>Staffing/teamwork</td>
</tr>
<tr>
<td>Balance/Gait Deficits</td>
<td>Furniture height and design</td>
<td>Not integrating evidence from multiple disciplines</td>
</tr>
<tr>
<td>Sensory Deficits</td>
<td>Lighting</td>
<td>Not using standard definitions</td>
</tr>
<tr>
<td>Cognitive Impairment</td>
<td>Room design</td>
<td>Lack of process coordination</td>
</tr>
<tr>
<td>Age &gt; 80 years</td>
<td>Flooring</td>
<td>Lack of training</td>
</tr>
<tr>
<td>Medication side effects</td>
<td>Railings</td>
<td></td>
</tr>
<tr>
<td>Urinary frequency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orthostatic Hypotension</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What is a “Wicked” Problem?

• Solutions may have unintended consequences

• No definitive solution…Understanding of problem depends on your frame of reference
  – Technical
  – Social/Adaptive

(Rittel & Webber, 1973; Pronovost, 2011)
Technical-Biomechanical Frame

- Problem: Fall occurs because center of mass is outside base of support
  
  (O’Sullivan & Schmitz, 2007; p. 253)

- Solution to problem: Control the center of mass

https://www.unmc.edu/patient-safety/capturefalls/tool-inventory.html
Social-Organizational Frame

Does your fall risk reduction team integrate evidence from multiple disciplines to continually improve fall risk reduction efforts?

(Jones et al., 2015)
The Solution to Wicked Problems

Effective teams—fundamental structure for managing complexity/learning and implementing change in organizations (Edmondson, 2012; Higgins et al., 2012; Jones et al., 2015)

CAPTURE Falls Solution
Collaboration And Proactive Teamwork Used to Reduce Falls

Improve structure and coordination of organizational processes

- Standardize definitions for reporting & benchmarking
- View fall risk reduction as an organizational goal that multiple teams coordinate to achieve

“Two or more component teams that interface directly and interdependently in response to environmental contingencies toward the accomplishment of collective goals.”

(Mathieu, Marks, & Zaccaro, 2001, p. 290)

http://teamstepps.ahrq.gov/
Objective 2.

Describe the three major component teams of a fall risk reduction multiteam system
Structure: Fall Risk Reduction MTS

Core Team—people who provide direct patient care
- Diagnose and treat using evidence-based care plan
- Conduct fall risk assessment
- Implement universal and targeted interventions that address risk factors
- Conduct medication review
- Evaluate mobility and function
- Report and learn from falls—participate in post-fall huddles
Structure: Fall Risk Reduction MTS

Coordinating Team—nurse champion, CNA, pharmacist, PT/OT, QI, senior leader

- Manage resources
- Coordinate fall risk reduction program and interventions
- Hold core team accountable for reliably implementing evidence-based interventions…
- Span location, status/hierarchy, and knowledge boundaries across disciplines (Edmondson, 2012)
Right Coordination

- Standardize
- Adjust
- Plan

Accountability → Predictability → Shared Mental Model

(DeChurch et al., 2009; Okhuysen et al., 2009)
Coordination Score  (Max Score = 84)

1. Integrate evidence from multiple disciplines
2. Policies/procedures
3. Interventions
4. Fall risk assessment tool
5. Link risk factors to interventions
6. Audit intervention implementation
7. Communicate audit results to staff
8. Develop reporting forms
9. Collect fall-related data
10. Analyze fall-related data
11. Modify policies/procedures based on data
12. Communicate to staff about actions taken as a result of reported falls
13. Conduct individual RCA
14. Conduct aggregate RCA
15. Education about fall risk reduction policies/procedures
16. Education about fall risk assessment tool
17. Education to choose appropriate interventions
18. Education to report assisted and unassisted falls
19. Education about fall risk reduction program outcomes
20. Communicate barriers and successes to CEO
21. Communicate barriers and successes to board
Plan Training

Training Topics
1. Fall risk reduction program (Max Score = 12)
2. Use of fall risk assessment tool (Max Score = 15)
3. Safe transfers & mobility (Max Score = 15)
4. Use of mechanical lifts (Max Score = 15)
5. Post-fall huddles (Max Score = 15)
Plan Training

Training Criteria

• Conduct regularly
• Include in new employee orientation
• Implement policy to sustain training
• Include appropriate staff
• Provide opportunity to practice skills
• Assess competency of skills
Structure: Fall Risk Reduction MTS

Contingency Team—members from various teams conduct post-fall huddle
- Meet immediately after a fall to determine what happened, why it happened, what will be done differently…ADJUST

- Goals:
  1. Decrease risk of future falls for an individual patient
  2. Apply what is learned to decrease risk across system
  3. Build trust and share knowledge

(Reiter-Palmon et al., 2015)

Post-Fall Huddle Tools
http://www.unmc.edu/patient-safety/capturefalls/tool-inventory.html
Objective 3.

Relate five fall risk reduction outcomes to the coordination and training processes conducted by an interprofessional fall risk reduction team.

(See the posted rubric to understand how team processes were scored to complete the analyses).
## Fall Risk Reduction System

### Structure
1. Multi-Team System
2. Valid risk assessment tools
3. Reporting/learning system

### Process
1. Reliably implement bedside processes
2. Coordinate processes
3. Conduct Training
   1) Overall Program
   2) Fall Risk Assessment
   3) Safe Transfers/Mobility
   4) Use of Mechanical Lifts
   5) Post-fall Huddles
4. Conduct Post-fall Huddles

### Outcome (Fall Risk)
1. Total Fall Rate
2. Unassisted Fall Rate
3. Injurious Fall Rate
4. Repeat Fall Rate
5. Reporting Fall Outcomes

(Donabedian, 2003)
Five Fall-Related Outcomes

1. Total Fall Rate = (Unassisted + Assisted Falls/Patient days) x 1000

2. Unassisted Fall Rate = Unassisted Falls/Patient days) x 1000

3. Injurious Fall Rate = Injurious Falls/Patient days) x 1000

4. Repeat Fall Rate = Total Falls/Unique Patients who Fell
## Five Fall-Related Outcomes

### 5. Reporting Fall Outcomes

<table>
<thead>
<tr>
<th>Fall Events</th>
<th>Frequency Reported (Max Score = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Never</td>
</tr>
<tr>
<td>Unassisted Falls that result in injury</td>
<td>0</td>
</tr>
<tr>
<td>Unassisted Falls that DO NOT result in injury</td>
<td>0</td>
</tr>
<tr>
<td>Assisted Falls that result in injury</td>
<td>0</td>
</tr>
<tr>
<td>Assisted falls that DO NOT result in injury</td>
<td>0</td>
</tr>
</tbody>
</table>
Unassisted and Assisted Falls as Outcomes

- Unassisted falls represent system failure
- Assisted falls that do not result in harm to patients or staff will occur as hospitals prioritize early mobilization to prevent secondary deconditioning and pressure ulcers
System Failure—Unassisted Falls

Unassisted falls significantly more likely to result in harm than assisted falls

Association Between Assistance and Injury for 353 Adult Patient Falls Reported by 17 Small Rural Hospitals 8/12 - 7/14

- **Assisted (n=90)**
  - Moderate-Major: 2.2%
  - Minor: 17.8%
  - None: 80.0%

- **Unassisted (n=263)**
  - Moderate-Major: 4.6%
  - Minor: 31.2%
  - None: 64.3%

*p=.021 Chi-Square Test*
## Five Fall-Related Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Advantage/Disadvantage</th>
</tr>
</thead>
</table>
| **Total Fall Rate**              | **Advantage**: Rate that is typically compared  
**Disadvantage**: Combines system failure + success                                           |
| *Benchmark Best = 3.1/1000 pt days* |                                                                                                                                                        |
| **Unassisted Fall Rate**         | **Advantage**: Measures system failure  
**Disadvantage**: Requires accurate reporting to separate unassisted and assisted falls        |
| *Benchmark Best = 2.4/1000 pt days* |                                                                                                                                                        |
| **Injurious Fall Rate**          | **Advantage**: Measures patient harm  
**Disadvantage**: Random element to injury (e.g. older adults with fragile skin)               |
| *Benchmark Best = 1.0/1000 pt days* |                                                                                                                                                        |
| **Repeat Fall Rate**             | **Advantage**: Measures what we should most prevent—repeat falls by same patient  
**Disadvantage**: A new outcome                                                                 |
| *Benchmark Best = 1.0*           |                                                                                                                                                        |
| **Reporting Fall Outcomes**      | **Advantage**: Focuses attention on all falls  
**Disadvantage**: Not thought of as an outcome                                                                 |
| *Best = 16*                      |                                                                                                                                                        |

*Derived from 5 Critical Access Hospitals with Highly Effective Teams*
# It Takes a Multi-Team System!

<table>
<thead>
<tr>
<th></th>
<th>Total Fall Rate</th>
<th>Injurious Fall Rate</th>
<th>Unassisted Fall Rate</th>
<th>Repeat Fall Rate</th>
<th>Reporting Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Team Processes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Targeted Bedside Interventions</td>
<td>-.205</td>
<td>-.309</td>
<td>-.344</td>
<td>-.414</td>
<td>.049</td>
</tr>
<tr>
<td>Universal Bedside Interventions</td>
<td>.167</td>
<td>-.039</td>
<td>-.064</td>
<td>-.541&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.173</td>
</tr>
<tr>
<td><strong>Coordinating Team Processes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness of 21 Coordinating Team Processes</td>
<td>-.443&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.383</td>
<td>-.586&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.129</td>
<td>.004</td>
</tr>
<tr>
<td>Training: Fall Risk Reduction Program</td>
<td>-.253</td>
<td>-.441&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-.418</td>
<td>-.235</td>
<td>.648&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Training: Fall Risk Reduction Tool</td>
<td>-.198</td>
<td>-.521&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.384</td>
<td>-.075</td>
<td>.125</td>
</tr>
<tr>
<td>Training: Safe Transfers and Mobility</td>
<td>-.003</td>
<td>-.277</td>
<td>-.200</td>
<td>-.414</td>
<td>.602&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Training: Mechanical Lifts</td>
<td>.350</td>
<td>.176</td>
<td>.214</td>
<td>-.590&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.344</td>
</tr>
<tr>
<td>Training: Post Fall Huddle</td>
<td>.317</td>
<td>-.174</td>
<td>-.009</td>
<td>-.586&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.330</td>
</tr>
<tr>
<td><strong>Contingency Team Processes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion of Falls with a Post-Fall Huddle</td>
<td>.097</td>
<td>-.392</td>
<td>-.109</td>
<td>-.465&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.391</td>
</tr>
</tbody>
</table>

<sup>a</sup>Statistically Significant Correlation p<.05; <sup>b</sup>Practically Significant Correlation p<.10
Summary—Leaders must know that:

• Teams are better able to manage complex patient safety problems because diverse individuals consider problems from multiple perspectives.

• Developing and sustaining interprofessional coordinating teams is essential for managing complex, “wicked” problems because coordinating interactions between processes may be more important than any individual process in determining system outcomes (Mingers & White, 2010)
  – Unassisted and repeat falls are system failures.
  – Assisted falls are system successes.
  – Fall risk reduction processes are NOT significantly associated with total fall rate.
  – The more effective the coordinating team, the lower the unassisted fall rate.
  – The more consistently post-fall huddles are conducted, the lower the repeat fall rate.
  – The better nurses are trained to use the fall risk assessment tool, the lower the injurious fall rate.
Thank you! And Questions
CAPTURE Falls Toolkit

Publicly Available at: http://www.unmc.edu/patient-safety/capturefalls/

• Gap Analysis Scorecard for Coordination and Training
• Fall Risk Assessments
• Worksheet to Compare Predictive Values of Risk Assessments
• Fall Risk Reduction Interventions
• Learning Forms
• Teamwork and Multiteam System
• Effective Meetings
• Post-Fall Huddles and Post-Fall Huddle Guide
• Using Data
• Mobility Assessment
• Safe Transfers & Mobility (16 videos)
• Medication Review
• Health Literacy
• Frailty & Geriatric Syndromes
References


References


