Coordination within Multiteam Systems Makes Healthcare Safer

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Objectives

1. Explain the background and rationale for implementing multiteam systems to achieve the patient safety goal of decreasing fall risk

2. Define coordination and boundary spanning in the context of multiteam systems

3. Recognize the association between effective coordination of fall risk reduction and fall rates

4. Describe the association between gait belt availability and usage on fall assistance and fall-related injury

5. Implement interprofessional coordinating teams to be accountable for achieving organizational patient safety and quality goals
Why Multi-Team Systems?

“Wicked” problems exist...

Harm to Patients

(Reason, 1997)
Why do patients fall?

System Factors

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

PLEASE CALL DON'T FALL

Your safety is important to us. If you need to get up, use the call button for assistance.

http://2.bp.blogspot.com/-2cYcmSYHrW0/T1euBpCWzI/AAAAAAAABvw/LCsQLvxPh4U/w1200-h630-p-nu/Beers+Criteria.jpg

http://2.bp.blogspot.com/-2cYcmSYHrW0/T1euBpCWzI/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)
What is a “Wicked” Problem?

• Solutions may have unintended consequences

• Definition of problem (and solution) depends on your frame of reference/context
  – Technical
  – Social/Adaptive (Rittel & Webber, 1973; Pronovost, 2011)
Technical-Biomechanical Context

• 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
Social-Organizational Context

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

(Jones et al., 2015)
What is a “Wicked” Problem?

• No definitive solution…technical and social factors embedded in a complex dynamic system (Rittel & Webber, 1973; Mingers & White, 2010)
Falls: Quality and Safety Problem

• **Prevalence** (Oliver et al., 2010)
  – 2% - 3% of hospitalized patients fall each year
  – 30% - 51% of falls result in injury

• **Benchmarks from National Database of Nursing Quality Indicators** (Staggs et al., 2014)
  – 3.4 falls/1000 pt. days
  – 0.8 injurious falls/1000 pt. days

• **Outcomes**
  – Cost...$14,000 greater for 2% of fallers with serious injury (Wong et al., 2011);
  – 1/11 Healthcare Acquired Conditions (HACs) PPS hospitals not reimbursed for
  – Falls contribute to 40% of nursing home admissions (Tinetti et al., 1988)
  – Fear of falling limits mobility (Tinetti et al., 1994)
What does the evidence tell us?

- **Randomized controlled trials**: Reliable use of bundled targeted interventions may be effective (Ang et al., 2011; Barker et al., 2016); single interventions not likely to be effective (Sahota et al., 2014; Shorr et al., 2012)

- **Cohort pre-post designs**: Fall risk has been reduced in studies where interprofessional team members were actively engaged in fall risk reduction efforts (Gowdy et al., 2003; von Renteln-Kruse et al., 2007)

- **Systematic review**: Etiology of falls is multifactorial (Oliver et al., 2004), thus falls require a multifactorial/interprofessional approach for prevention

- **Systematic review**: Themes specific to successful implementation of fall risk reduction programs include multidisciplinary implementation and changing attitudes of nihilism (Miake-Lye et al., 2013)
What does theory tell us?

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

What Defines a Team?

- Two or more people
- Interact dynamically
- Toward a common and valued goal (14% of team function)
- Have complementary skills and specific roles (12% of team function)

(Salas et al., 1992; Salas et al., 2008)
**Teams as a Structure of Care...Donabedian’s Quality Assessment Framework**

*(Donabedian, 2003)*

<table>
<thead>
<tr>
<th>Structure</th>
<th>Process</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>How care is delivered, organized, financed</td>
<td>Tasks performed that are intended to produce an outcome</td>
<td>“Ultimate Validator” Changes in individuals and populations due to health care</td>
</tr>
<tr>
<td>People, equipment, policies/procedures</td>
<td>Most closely related to outcomes</td>
<td>Time to develop, multifactorial, random component</td>
</tr>
<tr>
<td>Equivalent to system design, capacity for work</td>
<td>Causal relationship between process &amp; outcomes</td>
<td></td>
</tr>
</tbody>
</table>

Tasks performed that are intended to produce an outcome are most closely related to outcomes.
Our Quality Problem

Association Between Hospital Type and Fall Rates

- NE CAH 2010 (n=47)
- NE PPS 2010 (n=13)
- NDNQI 2011* (n=1,464)

Event Rate/1000 patient days

All Falls

- NE CAH: 5.9
- NE PPS: 4.0
- NDNQI: 3.4

Injurious Falls

- NE CAH: 1.7
- NE PPS: 0.9
- NDNQI: 0.82

*p = .01**

Staggs et al., Jt Comm Jrnl. 2014;40: 358-364

**Negative binomial rate model

(Jones et. al, 2015)
Problem Source: Organization

Structure and Process of Fall Risk Reduction in Nebraska Hospitals 2011*

- Interprofessional team (QI, RN, PT, Pharm)**
- Use specific definition of a fall**
- Use valid, unmodified fall risk assessment tool
- Annual competency training and new employee orientation**
- Benchmark fall rates to external organization**
- Reflect and learn from fall event data**
- Report falls to external organization**
- Integrate evidence from multiple disciplines**

*Jones et. al. J Rural Health.2015,31:135–145
**Statistically significant difference Pearson chi-square test

Percent of Hospitals
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

http://teamstepps.ahrq.gov/
Structure: Fall Risk Reduction Multiteam System (MTS)

“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/
Definitions for Benchmarking

• Fall: for the purposes of patient safety, a fall is a sudden, unintended, uncontrolled downward displacement of a patient’s body to the ground or other object (e.g. bed, chair, or bedside mat). (AHRQ Common Formats)

• Assisted Fall: when a patient begins to fall and is assisted to the ground or other lower object by staff (not family or other visitor). (NDNQI)
Definitions for Benchmarking

Extent of harm (NDNQI)

- **Death**: Patient died as a result of injuries sustained from the fall.
- **Major**: Fall resulted in surgery, casting, traction, consultation for neurological or internal injury or need for blood products.
- **Moderate**: Fall resulted in suturing, application of steri-strips/skin glue, splinting or muscle/joint strain.
- **Minor**: Fall resulted in application of dressing, ice, cleaning of wound, limb elevation, topical medication, bruise or abrasion.
- **None**: Patient had no injuries (no signs or symptoms resulting from the fall); x-ray, CT scan or other post fall evaluation resulted in finding of no injury.
- **Unknown**
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)
Core Team—people who provide direct patient care

- Diagnose and treat using evidence-based care plan
- Conduct fall risk assessment
- Implement targeted risk reduction interventions that address risk factors
- Conduct medication review
- Evaluate mobility and function
- Report and learn from falls—participate in post-fall huddles

http://teamstepps.ahrq.gov/
Boundaries—divisions between identity groups—exist between disciplines that make up the core team

(Edmondson, 2012)
Impact of PT Participation on Coordinating Team … Boundary Spanning

Role on coordinating team enhanced their ability to span boundaries between nursing and PT core teams

“…one of the things that we’ve tried really hard to do is to improve the communication with the nursing staff so that they understand that we have the skill set to help solve some of those problems that they run into when they have patients that are difficult to transfer….They rely on us a little more now to give them advice as to how to manage a patient better or what is safe for them and the patient.”
Impact of PT Participation on Coordinating Team … Boundary Spanning

“...now the hospital’s perception of us is that we’re not just somebody that goes in and does exercise and walks patients....our job is much more than that”

“...people know you as somebody in the hospital that helps to get policies in place.”

“Now that we’re a part of the [coordinating] team ... we are working with nurse supervisors and directors from across the hospital ... they can help communicate to their nurses the benefit of conversing with therapy, you know, on individual patients every day.”
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

• 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
Lesson Learned: Post-Fall Huddles Decrease Repeat Falls

Association Between Post-Fall Huddles and Repeat Falls per Patient (n=353 falls)

- Correlation coefficient: $r = -0.73$
Structure: Fall Risk Reduction MTS

Ancillary and Support Services—provide direct task-specific patient care (e.g. radiology, laboratory, dietary) and create a clean, safe environment (e.g. laundry, env. services, maintenance, IT)

- Know their role in fall risk reduction
- Know who is at risk (signage)
- Know what to do if see/hear at risk patient getting up
- Know who to tell

Should housekeeping stock gait belts and be empowered to turn on bed alarm for patient at high risk?
Should a phlebotomist respond to a bed alarm?
Structure: Fall Risk Reduction MTS

Administration—
- Create/support culture of safety
- Communicate goal of decreasing fall risk
- **Awareness**—be aware of gaps between current practice and best evidence
- **Ability**—make sure staff have the knowledge, skills, and time to make improvement (resources)
- **Accountability**—hold the coordinating team accountable for the structure, process, and outcomes of fall risk reduction program
- **Action**—hold the coordinating team accountable for taking action...educating, auditing, motivating (National Quality Forum, 2010)
What is Coordination?

Standardize

Plan

Adjust

Accountability

Predictability

Shared Mental Model

(DeChurch et al., 2009; Okhuysen et al., 2009)
Role of Coordination in MTS

- Component teams achieve proximal goals (scorecard)
- Coordination across MTS components achieves organizational goal

(Zaccaro, Marks, & DeChurch, 2012)

Coordinating: Develop/coordinate fall risk reduction program/conduct training

Core: Implement targeted and universal interventions at bedside

Management: Aware of gaps, holds coordinating team accountable for ability (training) and action

Contingency Team: Real time adjustment of care plan

Fall Risk
Role of Coordination in MTS

- Component teams achieve proximal goals
- Coordination across core team components achieves organizational goal

(Nursing, Pharmacy, PT/OT, Contingency Team)

Nursing: Assess fall risk based on observation / implement interventions at bedside

Pharmacy: Assess fall risk based on medication side effects/ medication debridement

PT/OT: Assess fall risk based on performance/ ensure competency in safe transfers & mobility

Contingency Team: Real time adjustment of care plan

(Zaccaro, Marks, & DeChurch, 2012)
Effectiveness of Fall Risk Reduction Coordinating Teams

- Low (N=6, Mean=37)
- Moderate (N=5, Mean=43.6)
- High (N=5, Mean=51.6)

(0=Not Done, 1=Not Effective to 4=Highly Effective)

- Select fall risk assessment tools
- Integrate evidence from multiple disciplines
- Select interventions to reduce fall risk
- Link targeted interventions to risk factors
- Educate staff to use fall risk assessment tools
- Educate staff to report all falls
- Provide frontline staff with information about actions taken
- Create policies and procedures
- Conduct audits to monitor adherence
- Select/develop/revise Fall Reporting Form
- Educate staff about policies and procedures
- Educate staff to choose appropriate interventions
- Educate staff about outcomes of program
- Communicate program barriers and successes to leaders
- Communicate results of audits to staff
- Share program outcomes with hospital board members
Lesson Learned: Effective Coordinating Teams Make Healthcare Safer

Association Between Effectiveness of Fall Risk Reduction Coordinating Teams and 2014 Total Fall Rates

Spearman
rho = -.51

Effectiveness Score - Fall Risk Reduction Team Activities
Sum of 16 Activities Scored 0 (Not Done) to 4 (Very Effective)
Lesson Learned: Effective Coordinating Teams Make Healthcare Safer

Association Between Effectiveness of Fall Risk Reduction Coordinating Teams and 2014 Unassisted Fall Rates

Spearman

\( \rho = -0.70 \)

Unassisted Falls Per 1000 Patient Days

Effectiveness Score - Fall Risk Reduction Team Activities
Sum of 16 Activities Scored 0 (Not Done) to 4 (Very Effective)
Lesson Learned: Focus on Making it Easier to Assist Mobility

- Unassisted falls MORE likely to result in injury and represent system failure

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

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

- **Unassisted (n=263)**
  - *p=.021 Chi-Square Test*
  - 64.3% Moderate-Major
  - 31.2% Minor
  - 4.6% None
Lesson Learned: Focus on Making it Easier to Assist Mobility

All other factors being equal, falling UNassisted is associated with…

Patient Characteristics

Age ≥ 65 (OR 2.55)
Cognitive impairment (OR 3.70)

System Characteristics

In the bathroom (OR 1.70)
Gait belt NOT identified as an intervention (OR 6.97)
Lesson Learned: Assist with a Gait Belt to Control Center of Mass

All other factors being equal, falls resulting in injury are associated with...

**Patient Characteristics**
- Age ≥ 65 (OR 2.55)

**System Characteristics**
- Being in the bathroom (OR 2.48)
- NOT Doing this (OR 3.65)
“Wicked” Problems

• Solutions emerge from
  – consensus of multiple diverse, perspectives
  – coordination of complex dynamic system by multi-team systems
    (Mingers & White, 2010)
  – Information sharing that achieves levels of transparency new to most organizations
    (McChrystal et al., 2015)

“There’s likely a place in paradise for people who tried hard, but what really matters is succeeding. If that requires you to change, that’s your mission.” – Stanley McChrystal p. 8
Summary

Patient falls are a "wicked" problem... Improvement in decreasing fall-related injury may require perceiving fall risk as a complex dynamic system in need of coordination across a multi-team system

(AHRQ Interim Update)
CAPTURE Falls Toolkit

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

- Scorecard for coordination
- Fall Risk Assessment
- 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