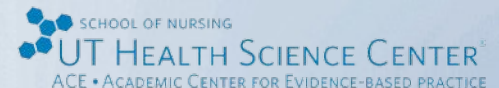**IMPROVEMENT SCIENCE**

RESEARCH NETWORK *. . . improving patient outcomes*

Breaking New Ground:
Forming Research Collaboratives to Conduct Improvement Studies

Kathleen R. Stevens, EdD, MS, RN, ANEF, FAAN
Lily Thomas, PhD, RN

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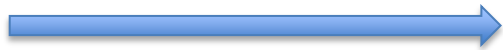UT HEALTH SCIENCE CENTER
ACE • ACADEMIC CENTER FOR EVIDENCE-BASED PRACTICE

About our Web Event

- For help, notify the Vcall team through the Questions window

- To refresh your screen, hit F5

- Visit www.isrn.net for a transcript and slides of this Web event.

Submitting Questions

- When: Anytime during the presentations

- How: Send a written question through the Questions window

Breaking New Ground:
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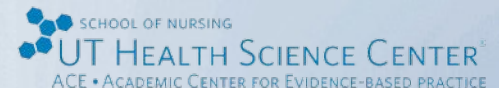
Kathleen R. Stevens, EdD, MS, RN, ANEF, FAAN
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Small Troubles, Adaptive Responses (STAR-2): Fostering a Quality Culture in Nursing

NETWORK INVESTIGATIVE TEAM
   Kathleen R. Stevens, EdD, RN, ANEF, FAAN
   Robert L. Ferrer, MD, MPH
   Amanda R. Sintes-Yallen, MPH

University of Texas Health Science Center

October 26, 2010

Context

- Endemic shortages of nursing staff and difficult working conditions present substantial barriers on the path to improvement. (Tucker)

- In frontline nursing, workarounds are a response to first-order operational failures exposing patients to errors and creating inefficiencies in care. (Hassmiller)

Background of Study

- Failures occur about one per hour per nurse on hospital units
- 95% of problems are managed through workarounds. (Observational, Tucker)
- Detection of first-order operational failures provides opportunity to move to system fixes and contributes to organizational learning.

Quote: Missed Learning Opportunities

"We never told the pharmacy when we got a dose of medicine that was more than we requested. We just squirted out the extra because we figured they were busy, they had not intended to make the mistake, and they wouldn't do anything about it anyway."

--Nurse Hosp #8

Tucker, 2008

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Quote: Missed Learning Opportunities

"…It was sad really because we weren't letting them have the information so they could fix their own problems."

--Nurse Hosp #8
Tucker, 2008

Small Troubles, Adaptive Responses (STAR-2):
Fostering a Quality Culture in Nursing

1. Detect

2. Intervene

Small Troubles, Adaptive Responses (STAR-1): Fostering a Quality Culture in Nursing

GOALS: Increase first-order operational failure problem solving:

- To determine if a program of *addressing* small problems in nursing care can lead to improvements in safety and quality

- To determine if addressing small problems will reduce distractions from bedside care, leading to greater nurse efficiency and improved satisfaction

STAR-1 Methods and Strategy

- Nursing units as complex adaptive systems

- Shift from 1st order problem solving (workarounds) to 2nd order problem solving (develop system solutions)

- Multiple prospective case study design

- Mixed-methods evaluation

STAR-1 DETECTION

Small Problems in Providing Care Today

Today's Date:___/___/___ Shift:_____
Unit:_____ Title:_____

Equipment/Supplies Description
1._____
2._____
3._____

Physical Unit/Layout Description
1._____
2._____
3._____

Information/Communication Description
1._____
2._____
3._____

Staffing/Training Description
1._____
2._____
3._____

Medication Description
1._____
2._____
3._____

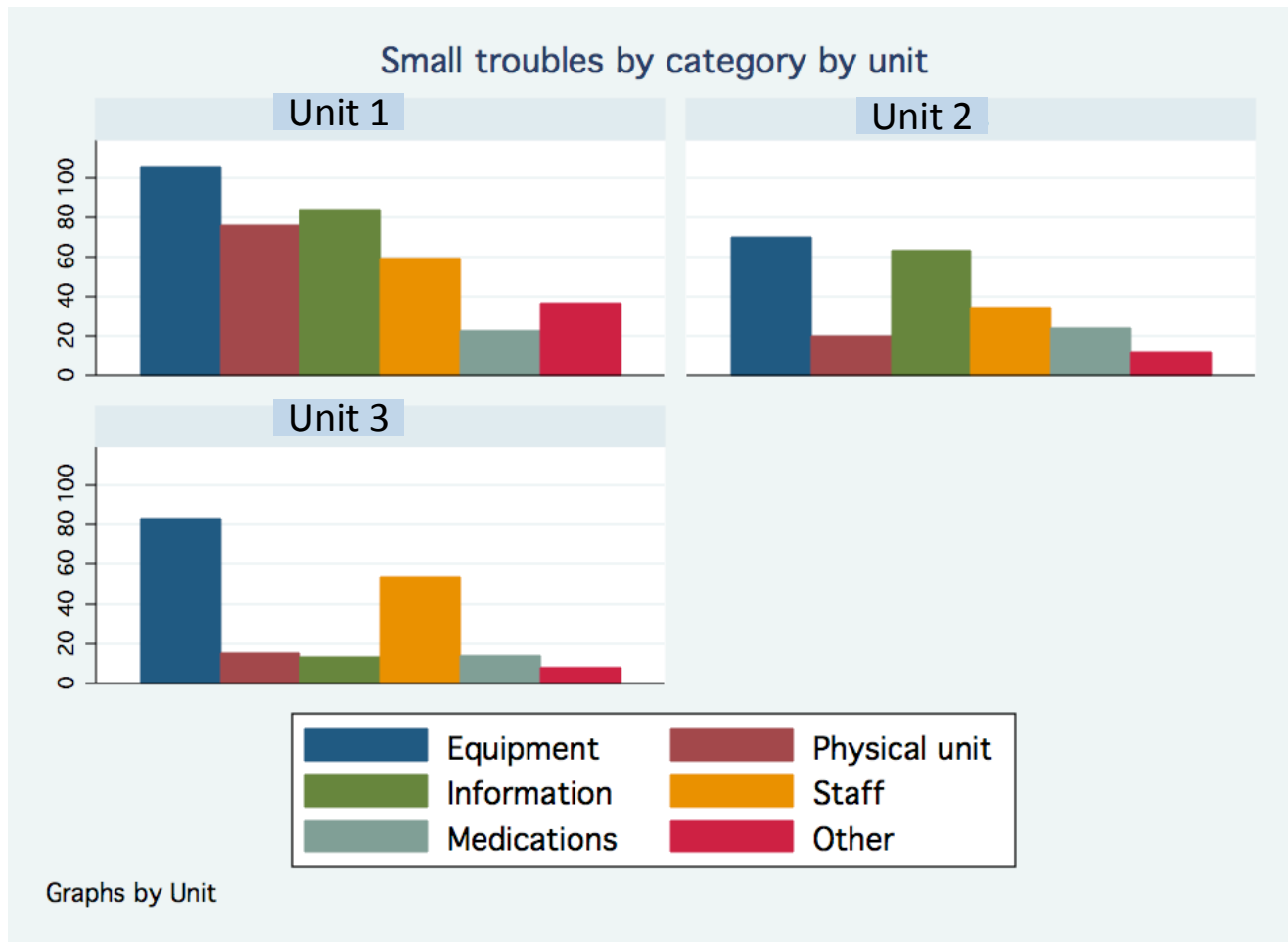**Other** Description
1._____
2._____
3._____

See the back for examples/definitions

POCKET CARD STUDY

STAR-1 Findings—SELF DETECTION

Small troubles by category by unit

Graphs by Unit

ISRN Network Study – STAR-2

Phase 1. Detect

Phase 2. Intervene

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Improvement Science Research Network Research Priorities

A. Coordination and Transitions of Care

B. High-Performing Clinical Systems and Microsystems Approaches to Improvement

C. Evidence-Based Quality Improvement and Best Practice

D. Learning Organizations and Culture of Quality and Safety

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Small Troubles, Adaptive Responses (STAR-2): Fostering a Quality Culture in Nursing

Pocket Card Study QUESTIONS:

1. What first-order operational failures do nurses self-detect?
2. Do self-detected first-order operational failures correlate with observed failures?
3. What factors are correlated with self-detection?

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NETWORK STUDY
Target Population and Sample

PHASE 1—DETECT/DESCRIBE

- Medical-Surgical hospital units

- Matched on key variables

PHASE 2--INTERVENTION

- Randomly allocated to facilitated/non-facilitated clinical units

TIMELINE

Small Troubles, Adaptive Responses (STAR-2): Fostering a Quality Culture in Nursing

Form Network Investigative Team   **July 2010**
- Kathleen R. Stevens
- Robert L. Ferrer
- Amanda R. Sintes-Yallen

Approve Network Study Protocol   _____
- ISRN Scientific Review Committee

Gain IRB Approval for Network Study   _____
- Develop IRB packet to guide sites

Activate Network Collaborative   _____
- Identify Site Investigators
- Train Study Sites
- Gain site IRB approvals   _____

Launch PHASE 1 Pocket Card Study   **March 2011**
Launch PHASE 2 Intervention Study   **January 2012**

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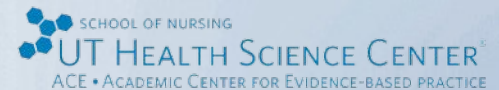
Background

MEDICAL ERRORS CONTINUE TO OCCUR!

- ✓ Medication errors are the most frequent type of errors in hospitals harming at least 1.5 million, causing 7,000 preventable deaths/year with annual costs ranging from $3.5 to $29 billion (IOM)
- ✓ Defined and reported in several different ways
- ✓ Many errors are not detected (Hughes, R., Blegan, M., 2008)
- ✓ Underreported (Pepper, G., 1995)
- ✓ 51% of ADEs and PADEs occurred during the administration stage (Leape et. al, 1995); (IOM, 2007)
- ✓ 96% errors were preventable (Picone et.al 2008)

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Background

- Medication administration is considered a high risk nursing activity!

- Medication administration is the most interrupted nursing care activity

- Nurses identify interruptions during administration of medications as the main reason for medication errors (Biron, Loiselle and Lavoie-Trombley, 2009)

Interruptions/Distractions

Hypothesis

Interruptions during medication administration increase errors

Method

Observational study of administration of over 4,271 medications

Results

Each interruption was associated with a 12.1% increase in procedural failures and a 12.7% increase in clinical errors.

(Westbrook,et.al.,2010)

Interruptions/Distractions

Findings

- Nurses experienced an average of 8.4 work system failures per 8 hour shift. Five most frequent type of failures involved medications, orders, supplies, staffing and equipment. (Tucker, A.L., Spear S.J., 2006, Health Services Research)

- Evidence Review (23 studies): 6.7 work interruptions per hour (14 studies), conceptual shortcomings and absence of theoretical underpinnings noted. (Biron, Loiselle and Lavoie-Trombley, 2009)

Significance

- One third of errors harming patients occur at the medication administration stage (Leape et. al, 1995)

- Nurses safeguard up to 86% of all errors made by others in providing medications (Leape et. al, 1995)

- Yet, medication administration has few safeguards because it is at end of process

- "Second victim phenomenon" (Trieber, 2010)

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Summary of Literature Review Knowledge and Gaps

- Refinement of terminology

- Studies done in international setting

- Lack of theoretical framework

- Methodological issues

- Confounding variables (knowledge translation not uniform, definitions and measures not standardized, culture of safety, sampling)

Theoretical Underpinnings

- Cognitive processing of interruptions
- Same sensory process used for **both** the interruption and the primary task
- **Two** inputs requiring the same physiological mechanisms

- Need to respond to interruptions
- Greater demands on cognitive processing resources
- Loss of memory contents or confusion among information cues
(Speier, et.al.)

Theoretical Underpinnings
Failures of Prospective Memory

- Reason (1990) identified the interval between the formation of an intention to act and the moment planned for its execution

- The intention has to be held in prospective memory

- A **vulnerable** part of memory system
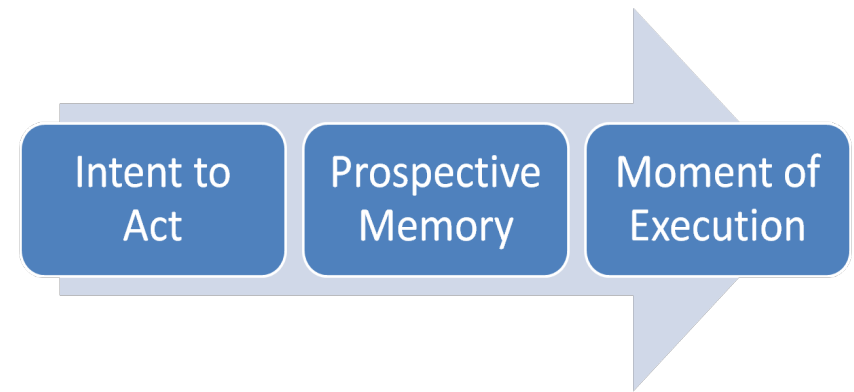
Intent to Act	Prospective Memory	Moment of Execution

Improvement Science Research Network Research Priorities

A. Coordination and Transitions of Care

B. High-Performing Clinical Systems and Microsystems Approaches to Improvement

C. Evidence-Based Quality Improvement and Best Practice

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Research Question

What is the impact of interruptions on medication administration errors?

Specific Aims:

– What organizational factors contribute to interruptions?

– What personal factors (inter and intra) contribute to interruptions?

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Research Sub problems

- What are competing quality, safety and patient care issues that interfere with medication administration?

- How does a nurse prepare a cognitive state that will assist in diminishing the ability to be interrupted?

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Research Plan

TWO PHASE STUDY

- PHASE 1: Descriptive Correlational
- PHASE 2 : Interventional

Preventing Medication Administration Errors

Form Network Investigative Team   **July 2010**
- Lily Thomas
- Patricia Donohue-Porter

Approve Network Study Protocol   _____
- ISRN Scientific Review Committee

Gain IRB Approval for Network Study   _____
- Develop IRB packet to guide sites

Activate Network Collaborative   _____
- Identify Site Investigators
- Select Network Study Sites
- Gain site IRB approvals   _____

Launch PHASE 1 Network Study   **March 2011**
Launch PHASE 2 Network Study   **January 2012**
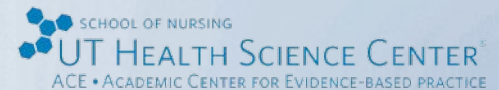
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Study Site Participation

Darpan Patel, PhD

University of Texas Health Science Center San Antonio

October 26, 2010

Overview

- Study site participation requirements
  - Membership in the ISRN
  - Submission of study site application

- Support for study sites
  - Protocol training session
  - Tool kit for study sites

Requirements for Site Participation

- Membership requirement
  - Site principal investigator and study coordinator must be members of ISRN
  - Institutional membership is not required

  - To join, go to www.isrn.net
    - Click on "JOIN NOW"
    - Click on "Member Center" to see fee structure

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Requirements for Site Participation

- ## Study site application
  - Will be located on the ISRN website
  - Will be available for download when first study is launched (Early 2011)

Support for Study Sites

- Protocol training session
  - A protocol training session will be conducted prior to the start of each study
  - Each Site PI and Study Coordinator will be required to attend
  - Session will be either a webinar or teleconference with the Network PI and Coordinating Center

Support for Study Sites

- Tool Kit for Study Sites
  - The ISRN will provide a tool kit for study sites to assist in the implementation of the study
  - Took kits will be specific for each study
  - May include:
    - Implementation guides
    - Checklists
    - Data collection materials (e.g., forms and surveys)
    - Data entry guidelines

Site Participation

- IRB Review Process
  - Network PI will submit protocol locally to his/her institution for initial approval
  - Site PI can then
    - Submit to institutional/local IRB for review

      or
    - Sign IRB Authorization Agreement

Site Participation

To express interest in becoming involved as a network study site, please contact the ISRN at:

ImprovementScienceResearch@isrn.net
Include in the subject line: Network Study

or

1-888-271-8938