# An Evidence-Based Evaluation of Medication Barcode Scanning Acceptance in a Community Hospital

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# **Objectives**

At the completion of the session, the participants will be able to:

- ▶ Discuss factors that influence the acceptance of medication barcode scanning.
- ▶ Discuss a process for evaluating the acceptance of medication barcode scanning.
- Name at least one practice change that could be implemented to improve the acceptance of medication barcode scanning in the participants' practice setting.

# **Problem Statement**

Barcode Medication Administration (BCMA)  $\rightarrow$ 

Evidence-based practice for safe medication administration

- ▶ Preponderance of Evidence: BCMA decreases medication administration error/increases medication accuracy rates (Hassink et al., 2012)
  - 41.4%, p < .001 (Poon et al., 2010) to
  - 80.7%, p < .001 (Bonkowski et al., 2013)
- ▶ Leapfrog Group New in 2016
  - Launched on April 1<sup>st</sup>, results reported by hospital in late July
  - > Factsheet: Bar Code Medication Administration. Retrieved from http://www.leapfroggroup.org/sites/default/files/Files/BCMA\_FactSheet.pdf

# Problem Statement (cont.)

Lack of adoption and acceptance of BCMA.

- ▶ VHA hospitals Ethnographic studies (Patterson et al. 2002, 2006) Lack of scanning medications and patient ID bands observed
- ▶ Koppel et al. (2008) 307,698 medication administrations
- ▶ Early et al. (2011) Medication scanning compliance was 82%
- ▶ Pedersen et al. (2013) 65.5% of hospitals have implemented BCMA systems
- Contributors to lack of scanning:
  - Lack of available, functioning equipment
  - Issues with patient ID bands (damaged, worn)
  - Issues with medication barcodes

# Methods

Setting: A community hospital in a rural setting in the mid-west

- Sixty-one acute care beds
- BCMA utilized in:
  - Acute inpatient, intensive care, and obstetrics
  - · Emergency department
  - Surgical services: patient holding, post-anesthesia care area, and endoscopy
- Nurses and respiratory therapists used BCMA

# Methods

- Staff perception survey, based on the technology acceptance model (TAM; Davis, 1989; Holden & Karsh, 2010)
- ▶ TAM derived from: Theory of Planned Behavior (Ajzen, 2011; Ajzen & Fishbein, 1969)
  - An individual's behavior → influenced by their intention
  - Behavioral intention  $\rightarrow$  determined by an individual's beliefs, and if "important" others and most people support the behavior
- ▶ There are several TAM-based surveys. Holden et al. (2012) survey:
  - Specific to BCMA
  - o Included additional variables specific to healthcare environment

# Methods

Survey Variables:

Perceived Ease of Use, Perceived Usefulness, Perceived Usefulness for Patient Care

Influence of Others, Staff Beliefs: Patient Perceptions

Training, Technical Support

Intention to Use, Satisfaction

Survey had 32 questions with a seven-point rating scale

Cronbach's  $\alpha > .80$  for subscales (except  $\alpha > .70$  for PEoU & Influence of Others, Intention to Use [Holden et al., 2012], Satisfaction [project])

# Methods: Frames Conceptual Model as a Guide

- Frames
  - > Mental models or maps (Bolman & Deal, 2013)
  - > Synthesize data and information into patterns, efficient
  - Guided the project
- ▶ BCMA Assessment at the Community Hospital
  - > Structural (factory): Wireless scanner on a mobile cart, BCMA policy
  - > Human resources (family): Informatics Nurse & IT staff
  - > Political (jungle): No competition
  - > Symbolic (social & cultural anthropology): Story-telling used about the impact of BCMA





# Results

#### Participants:

- > 30% response rate (44/143)
- ▶ Experienced in their role and with computer use
  - Years in current role M = 10.43 (SD = 10.67)
  - Computer use at work M = 9.90 (SD = 6.77) years; at home M = 15.27 (SD = 5.85) years
- ▶ 41% of respondents were 30 to 39 years of age; 41% were 40 to 59 years old.

There was no significant difference when the mean ranks for the age categories were compared for the nine subscales

# Results

#### All questions/Subscales

- ▶ Mean scores for all questions: 3.19 to 4.96 on a seven-point scale
- ▶ Staff were in general satisfied with BCMA and intended to use it

#### Highest Scores for the Nine Subscales

- ▶ Intention to use BCMA variable (M = 4.96, SD = 1.42)
- ▶ Influence of others variable (M = 4.74, SD = 1.76)

#### **Lowest Scores**

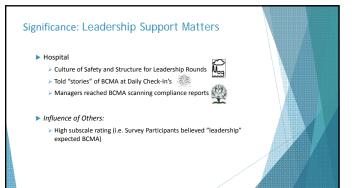
- ► Technical support variable (M = 3.20, SD = 1.88)
- ► Training variable (M = 3.2, SD = 3.19)

# Significance and Discussion

- ► Community Hospitals have Unique Challenges
- ► Leadership Support Matters
- ▶ Opportunities to Continuously Improve are Plentiful
- New Key Stakeholders are Emerging Dwell in Possibility
- ▶ Frameworks and Evidence-Based Tools are Vital Guides

# Significance: Community Hospitals' Unique Challenges

- ▶ Consider the interaction of the Community Hospital within the macro-system
- > Is the community hospital "voice" being represented/heard?
- ▶ Be aware of appropriate variations in practices/Unique patient populations
  - Patients' own behavioral health medications in a vial in an ambulatory clinic (pedigree cannot be verified and med cannot be scanned)
  - > Amish Significant patient teaching needed related to the safety purpose of technology
- ▶ Unique interprofessional team roles
  - Nursing and Respiratory Therapy have some overlap in scopes of practice (nebulizer treatments during the night in ED)
  - Perceived Usefulness and Usefulness for Patient Care:
    Similar results for Respiratory Therapy, Obstetrics, and Surgical Services



Significance: Improvement Opportunities are Plentiful

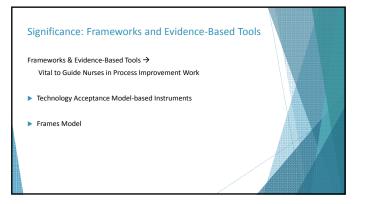
Use of technology does not ensure there are not improvement opportunities.

The hospital had used BCMA for several years

Some processes had not been maintained
Process to return non-scanning meds to Pharmacy

Through the project new processes emerged
Registration clerks discussing BCMA with patients & families

# Significance: New Stakeholders New Key Stakeholders Emerged – Dwell in Possibility This project included Respiratory Therapists Key survey result: Patients and families value BCMA a moderate amount Patient and Family Advisory Council gave additional input Registration Clerks: Placed ID bands (used for scanning) on almost all patients New Process: Standard work and patient information statement (5th grade level) used by Registration Clerks when the ID Bands are placed



# Lessons Learned Collaboration and confirmation with the organizational leadership is crucial for a successful project Use mixed-methods research design in conjunction with quality improvement techniques Dwell in possibility New stakeholders Different framework to guide the project

# Wrap-Up

References

- What unique circumstances, such as medications, patient populations, etc. might be barriers to BCMA in your organization?
- Using Frames (Bolman and Deal, 2013) what structures, human resource practices, symbols are in place that support or hinder BCMA at your organization?
- What new key stakeholders at your organization could provide BCMA acceptance and adoption support?



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