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) → 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 (Borkowski et al., 2013)

- Leapfrog Group – New in 2016
  - Launched on April 1st, results reported by hospital in late July

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
  - 10% of alerts ignored

- 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 & Kach, 2010)

- An individual’s behavior influenced by their intention
- Behavioral intention 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
- 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 α > .80 for subscales (except α > .70 for PUCU & 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 $M = 9.9$ (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.

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 medication 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: Leadership Support Matters

- Hospital
  - Culture of Safety and Structure for Leadership Rounds
  - Told “stories” of BCMA at Daily Check-In’s
  - Managers reached BCMA scanning compliance reports

- Influence of Others:
  - High subscale rating (i.e. Survey Participants believed “leadership” expected BCMA)

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 (5º grade level) used by Registration Clerks when the ID Bands are placed

Significance: Frameworks and Evidence-Based Tools

Frameworks & Evidence-Based Tools → Vital to Guide Nurses in Process Improvement Work

- Technology Acceptance Model-based Instruments
- Frames Model
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

- 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?

Questions?

References


