Medication Administration Barcode Scanning Verification

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ABSTRACT

- Bedside medication verification, specifically barcode scanning, is a known measure to improve patient safety and reduce the risk of medication errors yet there still exist barriers to effective barcode scanning.
- Studies of bedside medication verification and barcode scanning have identified workarounds for nurses using barcode scanning and the potential errors linked with each workaround.
- The workarounds are usually a result of barriers the nurse faces successfully implementing the designed scanning and verification process.
- Continued research can improve the reduction of workarounds, barriers and the subsequent potential medication errors.

PURPOSE

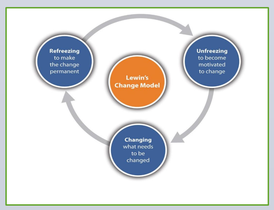
The purpose of this project is to investigate barriers to barcode scanning among nurses in an urban acute care facility.

CONCEPTUAL FRAMEWORK: Lewin's Model of Change

Lewin's Model of Change involves three stages of change that can be applied to the process of medication administration using barcode scanning for verification. "Unfreezing" makes it possible to let go of old habits and ways of doing things, such as Nursing's former ways of medication administration prior to advances in technology such as barcode scanning.

"Changing" is learning of the new process of medication administration and moving to a new level of education and competence, such as the education Nursing is experiencing in learning barcode scanning verification in administering medications.

The third and final stage is "Refreezing", or establishing the new changes learned as habits and hardwiring these new practices of medication administration into Nursing's common working procedures.



As nurses learn and follow the process of barcode scanning for verification and it becomes more hardwired through "refreezing" and there will be less use of workarounds.

RESEARCH QUESTION

What are the most important barriers to bedside medication verification scanning rates for nurses in an acute care hospital?

METHODOLOGY

A descriptive survey design will be used to investigate fifty nurses' experiences with barriers to medication administration barcode scanning verification. A link to a Qualtrics survey will ask those volunteering to participate to sign a consent and afterwards to complete the survey capturing demographics, 28 pre-set questions rank-ordering the most common known barriers in addition to 16 open-ended questions. Data will be entered into SPSS version 23 and analyzed using descriptive statistics. Narrative data will be entered into Atlas.ti and examined for recurring themes.

REVIEW OF LITERATURE

- Researchers studied barcoded medication administration at five hospitals.

- Fifteen types of workarounds were identified in the following three categories:
  - Omission of process steps
  - Steps performed out of sequence
  - Unauthorized barcode medication administration process steps
- The authors also identified 31 probable causes of barcode medication administration workarounds and compiled them in these categories:
  - Technology related
  - Task related
  - Organizational related
  - Patient related
  - Environmental related
- Repeated examinations and corrections of barcode medication administration scanning systems actual uses are needed to optimize their role in preventing medication errors.

(Koppel, Wetternick, Telles, & Karsh, 2008)

- ❑ Reliance on the nurse to apply the bar code technology as intended is an important, but not the only, consideration in determining bar code medication administration (BCMA) technology effectiveness for reducing medication error rates. Human factors should be a consideration in workarounds with the BCMA design and should be considered in reducing error rates.

(Young, Slebodnik, & Sands, 2010)

REVIEW OF LITERATURE (continued)

- Use of barcode medication administration substantially reduced the rate of errors in order transcription and in medication administration also as well as decreasing potential adverse drug events.
- The data showed barcode scanning is important to improve medication safety.

(Poon et all, 2010)

- ❑ Through a comprehensive review of literature researchers reviewed non-compliance behaviors with barcode medication administration.
- ❑ The authors identified 128 of causes that were grouped into these five categories:
  - Poor visual and audio interface
  - Poor physical ergonomic design
  - Poor information integrity
  - Abnormal situations for system use
  - User reluctance and negligence
- ❑ The results showed successful use of a barcode administration system requires a supportive environment for success.
- ❑ Problems are most likely system issues rather than that of individual users or devices.

(Lee, Lee, Kwon, & Yi, 2015)

- Barcode scanning system implementation is a difficult process with several barriers. An analytic hierarchy process (AHP) showed the most important barriers to implementation of a barcode system were fear of change, negative perception of technology, and process flow issues. Raising awareness of barriers and overcoming the barriers may be helpful in the improvement process.

(Alharthi, Sultana, Al-amoudi & Basudan, 2015)

- ❑ Most failed scans were attributable to the lack of a bar code on a product or problems with NDC recognition by the barcode medication administration database.
- ❑ When such problems were addressed scan rates improved.

(Strykowski, Hadsall, Sawchyn, Vansickle, & Nizneck, 2013)

- A study considering institutional practice constraints, technology constraints and the practical knowledge of nurses shows that the assumption of using barcode scanning to minimize human intervention is too narrow a view to realize the safest patient care. Practitioners have valuable knowledge which should be embraced.

(Boonen, Vosman, & Niemeijer, 2015)

REVIEW OF LITERATURE (continued)

- ❑ During direct observation of 300 medication administrations, three BCMA workarounds were identified in fifteen medication errors:
  - failure to visually confirm patient's identification
  - failure to compare the medication to the electronic medication administration record at least twice before administration
  - charting the medication prior to actual administration.

(Hardmeier, Tsourounis, Moore, Abbott, & Guglielmo, 2014)

- To improve patient safety organizations should educate patients about barcode technology, use reports on scanning compliance to drive improvements, provide staff education and implement the barcode technology as soon as possible after the training, provide training upon return to work for staff that are absent during the initial phase of implementation, provide super-users, and identify and correct causes of inability to scan medications.

(Smetzer, Baker, Byrne, & Cohen, 2010)

- ❑ Overriding barcoded doses represents the cause of a significant proportion of potential medication errors after implementing a barcode medication administration system. There is a need to continually improve the clinical components of the medication delivery process and measure the efficacy of the technology.

(Early, Riha, Martin, Lowdon & Harvey, 2011)

CONCLUSIONS

Barcode scanning for medication verification does work to improve medication safety but there continue to be barriers and resulting workarounds that call for continued research so that the issues and problems can be addressed and corrected.

REFERENCES

References provided upon request.

IRB APPROVAL

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