Project Submission:
2009 Delaware Valley Patient Safety Award

MERCY SUBURBAN HOSPITAL

*"Beyond Bar Coding:
Creating a Bar Coding Culture of Safety"*

Beyond Bar Coding: Creating a Bar Coding Culture of Safety

Summary of Initiative

The most recent ISMP statistics state that 26% of U.S. hospitals utilize computerized bar coding to decrease medication dispensing and administration errors. Concurrently, the Institute for Safe Medication Practice (ISMP) and the Joint Commission (TJC) have released studies that, while supporting the use of technological solutions, such as bar coding, warn organizations not to rely on these patient safety interventions without considering the potential for human error created through reliance on these technological advances.

Within the past year, our hospital implemented Medical Administration Check (MAK), a computer application using bar codes and wireless technology to provide an additional layer of patient safety to the inpatient medication management process. While bar coding technology has the potential to significantly reduce the instance of medical error, we recognized that maximum benefit of bar coding technology would be achieved only by integrating this new technology into our organization's existing culture of safety to ensure that our colleagues were using the system as it was intended, free of "work arounds" and other short cuts that would reduce the system's effectiveness.

Reports generated by the bar coding system provided the team with information to isolate potential problem areas and to channel trending data and colleague feedback to develop supplemental education to eliminate new opportunities for medication error.

By placing the bar coding system as an overlay to our existing culture of safety program, we have established the groundwork to recognize bar coding as an important component of our culture of safety program, not as its substitute.

Beyond Bar Coding: Creating a Bar Coding Culture of Safety

Goals

The goal of our project was to integrate bar coding technology into our hospital's existing culture of safety. Recent ISMP statistics state that 26% of U.S. hospitals utilize computerized bar coding to decrease medication dispensing and administration errors. Concurrently, the Institute for Safe Medication Practice (ISMP) and the Joint Commission (TJC) have released studies that, while supporting the use of technological solutions, such as bar coding, caution organizations not to fully rely on technological patient safety interventions without considering the potential for error created by use of these technological advances alone.

In order to better communicate our hospital's commitment to a culture of patient safety, the Patient Safety Committee developed and continues to communicate six basic elements on which our culture of safety is based:

- Harm is unacceptable
- Everyone is accountable for patient safety
- Work as a team
- Speak up when we have concerns
- Listen when others have a concern
- Use a systems approach, not individual blame, to identify and address safety issues

These tenets served as the basis for integrating the bar coding project into our patient safety program. The simple goal was to provide excellent patient care to our patients without harm with the full cooperation of physicians and colleagues working collaboratively. Our hospital adopted a "stop the line" for patient safety policy two years ago that empowers anyone to stop a procedure to express a concern. This policy was reviewed and re-enforced with staff to encourage a systems review when concerns are raised. Finally, we reinforced with managers the importance of recognizing that medication administration is a complex system with multiple components. When an error reaches a patient, we employ an interdisciplinary systems approach to determine where the weaknesses in the delivery system lie and work collaboratively to address those issues.

Baseline Data

Our hospital has an average daily census of 90 patients. In the nine months preceding implementation of the bar coding system, seven medication errors were reported as having caused temporary harm to a patient (no medication errors were characterized as more severe). Six of these seven medication errors were attributable to administration errors that the bar coding system was designed to prevent.

Interventions

Analysis of initial data generated by the MAK system quickly confirmed that colleagues were more focused on the technical rather than the patient safety-related aspects of their new medication administration regimen. Friendly, fun reminders regarding the patient safety aspects of medication administration began to appear; infomatics staff worked round the clock to provide an atmosphere that encouraged questions and provided quick, memorable responses. As staff became more comfortable with their individual skills, these additional interventions were employed:

- Data-specific questionnaires are loaded in each MAK WOW (Workstation on Wheels) on a monthly basis to assess the progress of individual colleagues utilizing MAK and providing quick education on issues common to several MAK users. Most recently, the questions included:

    - What suggestions do you have to improve practice and make your patients safer?
    - Are you changing your practice and scanning all meds before you open packet?
    - Are you notifying pharmacy of medications not scanned through the RX message?
    - Are you ensuring patient safety by NOT overriding the identification bracelet?
    - Did you know that Insulin and Dilaudid were the top two medications not scanned properly last month?
    - Is your WOW within visible sight when you are scanning the patient's wristband?

- Ongoing Education - Nursing newsletters, distributed monthly, detail statistics and commonly identified errors to help colleagues to understand the importance of using the system in the manner intended and encourage users to identify and report roadblocks within the bar coding and medication delivery system that might increase the likelihood of alternate systems that would increase error. Other patient safety issues, including hand hygiene, observing isolation precautions

- Identification and Removal of Roadblocks and Work Arounds - The Medication Management team works collaboratively to identify, then to remove/minimize roadblocks to discourage staff from developing "work arounds" that decrease the protection to the patient provided by the bar coding system.

- A Bar Code Hotline - established to address questions or issues that could not be immediately addressed by the bar coding "Super Users". Colleagues were encouraged to leave a message and contact information on the hotline voicemail - the call would be returned promptly with an answer to the question. These

subsequent conversations often resulted in additional questions being raised and addressed and the resulting solutions communicated to colleagues through the use of monthly newsletters and MAK FACTs – tips posted to the WOWs as quick reminders of patient safety issues that must be considered when using the bar coding system. For example:

Mak Fact
Insulins can now go into isolation rooms.
When they come out of isolation rooms, they need to be cleaned with AntiBacterial Wipes.

- The top fifteen overridden medications are identified monthly via data review from the bar coding system. The administration and override data is reviewed by Pharmacy and Nursing to ensure that the bar coding designations were accurate for these medications and to identify potential error trends. If a trend is suspected, a root cause analysis involving a 100% review is performed and remedial education is targeted.

- Bar Coding Competency - No colleague is permitted to administer medications utilizing the bar code system until the colleague has successfully completed a bar coding competency.

Results

In the four quarters prior to implementation of the bar coding system, our hospital reported seven medication errors that resulted in temporary harm to the patient. Six of the seven errors were related to medication dispensing and/or administration. As we enter our fourth quarter of data analysis since implementation of the bar code project, we have recorded two medication errors that resulted in temporary harm to the patient.

Now entering the fourth quarter since implementation of the bar coding system, we have experienced a significant improvement by pharmacy and nursing colleagues to ensure that every medication that reaches our patients is scanned to deliver the right drug at the right time. Two medication errors have been reported that resulted in temporary harm to a patient. One of those errors was attributed to a "work around" of the bar coding process for which a non-punitive intervention including re-education was employed. The second error was the "perfect storm" of such intricacy that the use of the bar coding system could not have prevented it. Following a root cause analysis, we have identified a mechanism outside of the bar coding process that we believe will prevent its recurrence.

In the second quarter of 2009, we experienced an 81% reduction in system overrides in the third month of the quarter over the previous two months. Again, the team attributes this dramatic reduction in system overrides to a collaborative team approach between nursing and pharmacy colleagues to identify improperly bar coded medications and prompt action to resolve the issue before staff frustration leads to work arounds.

As predicted, implementation of the bar coding system has resulted in an increase in the number of medication errors reported. The system provides data based on every transaction, so identification of errors has become an automated process. As importantly, our colleagues now recognize bar coding as one tool among several to be used to deliver medications safely to our patients. By placing the bar coding system as an overlay to our existing culture of safety, our team theorizes that we have established the groundwork to recognize bar coding as an important component of our culture of safety program, not as its substitute.

Replication of the Initiative

While this Initiative was developed specifically to complement the installation of a bar coding system, the concept of establishing any new program as an element of the hospital's overarching culture of patient safety can be replicated. Through the integration of basic patient safety measures and rules into the bar coding project, we have been successful in defining the bar coding system as one of several mechanisms set in place to meet our patient safety goals, and not the goal itself.