ZEBRA

Putting Patient Safety First

BEST PRACTICES FOR IMPLEMENTING BARCODE MEDICATION ADMINISTRATION (BCMA)

One of the most common causes of avoidable patient injury are adverse drug events (ADEs). Nearly 5% of all hospitalized patients are affected by an ADE.[1] The frequency of these errors, the impact on patients' lives and the skyrocketing global costs, estimated at $42 billion annually, are staggering.[2]

How can healthcare organizations address these challenges? Industry experts agree that information technology solutions such as Barcode Medication Administration (BCMA) are the answer.

This white paper looks at how Southwestern Vermont Medical Center (SVMC) integrated an internationally acclaimed hospital-wide barcoding system. Their experience and best practices are essential reading for any healthcare institution seeking to improve clinical accuracy and patient safety.

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[1] "Medication Errors." *PSNet: Patient Safety Network*. AHRQ—Agency for Healthcare Research and Quality, Mar. 2015.
[2] *WHO Launches Global Effort to Halve Medication-Related Errors in 5 Years*. World Health Organization, 29 Mar. 2017

A Model for Patient-Centered Care

SVMC, located in Bennington, Vermont, is a four-time winner of the American Nurses Credentialing Center's (ANCC) prestigious Magnet designation which recognizes healthcare organizations that demonstrate nursing excellence, quality patient care, and innovations in the professional nursing practice. The medical center is part of an elite group of only 31 hospitals in the world who have achieved this distinction.

As an early innovator in patient safety, SVMC was among the first 25% of hospitals in the United States to implement a comprehensive admission-to-discharge barcoding system. For over a decade, this life-saving technology has helped the medical center decrease medication transcription and administration errors. The SVMC system makes use of BCMA and electronic medication administration record (e-MAR) technologies.

SVMC administers over 300,000 medication doses annually. They have achieved an average medication scanning accuracy rate of over 95%, which has resulted in an 80% reduction in medication errors. Clearly impressive results by any standard.

SVMC employed a user-centered implementation approach to make positive patient ID easier for frontline nurses. By following the best practices and learning from their BCMA implementation, healthcare organizations of all sizes can realize significant improvements in accuracy, patient safety and overall satisfaction.

A HOSPITAL-WIDE SYSTEM: FROM ADMISSION TO DISCHARGE
THE SVMC SYSTEM COVERS:

Patient admissions → Specimen collection → Computerized physician order entry → Medication administration → Patient record documentation

What is an Adverse Drug Event (ADE)?

The term ADE describes drug administration errors that include: incorrect drug selection, incorrect dosage or frequency and negative drug interactions. ADEs can result from the wrong medication being prescribed, the wrong medication being distributed by the pharmacy, or the wrong administration of the medication at the bedside.

Errors resulting in preventable ADEs occur during the stages of ordering, administration, transcription, and dispensing. **Over 30% of these errors are committed during patient medication administration.**[3]

BEST PRACTICES FOR IMPLEMENTING BCMA

1 Make it easy.

A successful BCMA system implementation helps nurses and clinicians verify patient identification and medications with the greatest possible ease and reliability. Nurses are busy and a system that is difficult to use or takes more time than the verification system it replaces creates a situation where workarounds occur at a higher rate. At SVMC, their core philosophy was simple: make it easy for the nurses to do the right (safe) thing.

2 Build a multidisciplinary project team.

Pharmacists, nurses, physicians and patients all have unique needs. At the same time, they share a common interest in ensuring patient safety. A multidisciplinary team approach brings these groups together to focus on what is best for patient care. At SVMC, the team was led by a clinical nurse specialist and included physicians, pharmacists, IT analysts, nurses, and professionals from the education and quality/safety departments. The team collaborated on making hardware and software selections, staff training and system implementation.

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[3] Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events: Implications for prevention. JAMA. 1995;274(1):29-34.

3 ▸ Engage end users.

Involving frontline staff in the process helps establish buy-in with users and provides an opportunity for real-life feedback about how the technology will actually be used while treating patients. It also aids in identifying potential problems in workflows that can lead to workarounds. The SVMC team invested extensive time in troubleshooting the system and anticipating challenges that might result in workarounds. Including a multidisciplinary team and frontline nurses in the process brought a multifaceted perspective to their analysis.

> "Implementation relied heavily on the involvement of our nurses. We had ideas as technical people of how things would work. Those ideas were completely different when we brought them to the actual patient bedside where care is delivered."
>
> SVMC IT project manager[4]

4 ▸ Be proactive.

Technology continues to advance and improve and it is important to be proactive. Advancing infection control requirements dictate new cleaning standards for electronic devices. Hard to scan items, such as medications with highly reflective packaging and IV bags with white barcodes on clear backgrounds, are making their way into the medical arena. Test the BCMA scanners to ensure they can read hard-to-scan items with a high-degree of accuracy. Validate that the devices can withstand the constant rigors of harsh cleaning chemicals and continue to operate at optimum levels.

The Agency for Healthcare Research and Quality (AHRQ) recommends that, prior to purchasing BCMA hardware, "hospitals should test scanners for compatibility and functionality with the actual barcodes that they will use."[5]

[4] Charles J. Still, MBA, CPPS, CPHQ; IT Project Manager; Southwestern Vermont Health Care; Feb 2007 – Nov 2015
[5] Best practices transforming quality, safety, and efficiency, Agency for Healthcare Research and Quality, Bar-coded medication administration.

95%+

A BCMA system needs to be utilized at an optimal rate of 95% or more to be effective.

99%+

At SVMC, nurses achieved a patient identification scan rate of more than 99% for inpatient units.

5 ▶ Educate the nursing staff.

A poorly implemented BCMA system will negate any potential safety benefits. Train your staff on the correct usage of the devices and applications; the proper device cleaning methods; and the best ways to report any problems that may arise. Set clear usage expectations and communicate them to users. A BCMA system needs to be utilized at an optimal rate of 95% or more to be effective. At SVMC, nurses achieved a patient identification scan rate of more than 99% for inpatient units.

RIGHT AND WRONG

Train users on both acceptable and unacceptable ways of using the BCMA system, such as scanning proxy barcodes not attached to a patient.

6 ▶ Employ devices that can read both 1D and 2D barcodes.

Patient wristbands are the cornerstone of every hospital identification system, and evidence-based best practices demonstrate that positive patient identification is enhanced by using a combination of 1D and 2D barcodes. In practice, 2D barcodes are becoming more prevalent and are used for identifying patients for all medications and collections. At the same time, many hospitals are still using 1D barcodes for glucose readers and other applications. That's why it is so important that devices that can read both symbologies. A laser scanner captures 1D barcodes, whereas an imager gives hospitals more flexibility because it can scan both 1D and 2D barcodes.

In the initial design phase at SVMC, the project team realized that standard 1D barcodes created challenges for scanning patient wristbands. The curvature of the wristband made it difficult to read the 1D barcode, making it necessary for the nurse to use one hand to stretch out the barcode to make it flat and the other to operate the scanner. As a result, the team decided to adopt an additional 2D data matrix on wristbands because it can be easily scanned from any angle.

7 ▸ Ensure imagers can read damaged and torn barcodes.

In the hospital environment, medications are handled many times before finally arriving at the patient bedside, traveling from the warehouse to the receiving dock, from the dock to the pharmacy, from the pharmacy to the dispensing cabinet and finally from the dispensing cabinet to the patient room. Throughout these travels, labels can easily become scratched, smudged or even torn. Make sure the scanning technology you choose can read damaged labels with a high degree of accuracy protecting caregiver productivity as well as the integrity of the medications they are intended to identify.

8 ▸ Establish a support team of nurses helping nurses.

Designate a support team of nurses who can assist as the project rolls out. Adopting this approach ensures caregivers receive support from other nurses, who have a better understanding of the pressures that they face on the frontline, rather than IT personnel. At SVMC, the system was rolled out unit by unit. Larger facilities, with expansive resources, may elect to implement a hospital-wide system at one time. In any case, it is helpful to have a team of nurses to help and ensure lessons learned are documented and evaluated throughout the process. The phased implementation enabled the SVMC project team to continually make improvements as the rollout progressed.

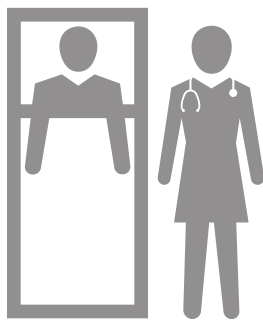## 9 ▸ Establish safeguards to prevent improper usage.

Hospitals should take active steps to prevent doing the wrong thing. Develop a policy that requires caregivers to verify the right patient for medication administration *only* by scanning the wristband to the BCMA system. Ensure that all oral or manual methods – such as scanning barcodes on paperwork – are disabled from scanning into the system.

10 Implement a robust evaluation and reporting process.

While many repetitive tasks become instinctive or second nature, SVMC found that this wasn't quite the case with BCMA. Ongoing monitoring and reporting is essential to ensure optimal performance of medication scanning. Six years after the first barcode was scanned at SVMC, a software issue resulted in the loss of statistical reporting capabilities for four months. Once restored, the importance of providing consistent monthly feedback to users on performance was revealed. The reports showed that without periodic feedback, the scan rates of the newest and most infrequent users had actually declined.

11 Maintain patient and medication scanning data.

In addition to reviewing day-to-day scan rates and compliance by unit, monthly data for each nurse should be summarized that shows their average scan rate as well as a comparison to the average scan rate for their unit. This data is highly useful as it compares all users in a specific unit with one another. Overtime, patterns emerge. Average scan rates one or more standard deviations below their peers over the course of a month can indicate that the nurse is doing something differently. Both the medication and patient scan rates should be captured and analyzed. In the case of high performers, they may be able to share lessons learned. For low performers, additional training or prompt discussions for ways to overcome any obstacles to success may be necessary.

"The system helps the nurse rest assured that if they are using the process correctly, then they are giving the medication correctly."

RN, MSN, clinical nurse specialist, SVMC

BCMA PAYS OFF

While BCMA systems reduce wrong patient, wrong medication and wrong dose errors, use of the technology alone is not the complete solution. The ongoing collaboration of a multidisciplinary team, auditing, tools to detect unwanted workarounds, and responsiveness to end user feedback must be part of any effective implementation plan. Only with a well-thought-out approach and continuous monitoring and improvement can a hospital be assured of a successful implementation and a culture of patient safety throughout the organization.

"I don't think I would want to go back to the old way. This is the safest way for both the nurses and the patients."
Unit nurse at SVMC

To learn more about how BCMA can help you improve patient safety, visit www.zebra.com/healthcare.

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