Issues and Opportunities for Introducing Bar Code Systems in Hospitals

A ZEBRA **BLACK&WHITE** PAPER

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Executive Summary

Bar coding is widely acknowledged as one of the strongest and most cost-effective methods for improving patient safety. But many healthcare organizations are reluctant to implement bar coding because of their misperceptions about integration challenges and supporting system requirements. In reality, bar coding offers the benefits of flexible, open-system technology that can improve patient safety through standalone applications, integrate with legacy healthcare IT systems, and provide a migration path to future system upgrades.

Hospital IT personnel can prepare their organizations to benefit from bar code patient safety systems by dispelling the misperceptions and setting the foundation for adoption. Establishing bar code standards and policies is a starting point that will help multiple departments implement applications that can leverage legacy systems, and provide a migration path to maximize the return on bar code investments.

This document addresses common misperceptions about bar code technology and provides guidance for establishing practical policies, standards, and implementation strategies.

Issue: We can't take on another proprietary system.

Reality: Bar coding doesn't need to be proprietary. Most bar codes simply act as a shortcut for entering a string of data or looking up a database record. Bar code scanning replaces keyboard or manual data entry on the front end of a system. Legacy systems may not require much modification to accept bar code data entry.

Bar code printers and readers support multiple connectivity protocols and interface standards, which simplifies the task of integrating new bar code applications into hospital information systems. Zebra® bar code printers, for example, are available with USB, Ethernet, 802.11b-standard wireless, and other network interfaces. Some models and options allow direct connection to XML applications and leading database and enterprise software systems. Because open, standard products are available, hospitals can set policies that require bar code systems to comply with organizational IT standards.

Issue: Bar coding is of limited value to us because we don't have a CPOE or EMR system.

Reality: Effective bar code applications for patient safety can be implemented without a computerized physician order entry (CPOE) or electronic medical record (EMR) infrastructure. Medication administration is probably the most important and effective use of bar coding to improve patient safety, and does not require a CPOE or EMR system in place. The FDA estimates that bar code applications would prevent 50 percent of medication administration errors, but actual users have reported more than 80 percent reductions. Medication administration impacts many operations, because it requires bar-coded patient wristbands, unit-dose labels with bar codes, bedside scanning equipment, and the software application to confirm the drug administration. Packaged solutions are available and cost less than more far-reaching EMR and CPOE systems. Cost-effective bar code applications can also be implemented for identifying and managing specimens, blood products, medical equipment, files and records, and more. Bar code investments will be leveraged if CPOE or EMR systems are implemented later, because the bar code system can remain in place and be integrated to complement the new applications. To learn more about patient safety applications and how to implement them, see Zebra's white papers "Patient Safety Applications of Bar Code and RFID Technology," "It's All in the Wrist: Improving Patient Safety with Bar Code Wristbands," and "How Hospital Pharmacies Can Use Bar Coding to Improve Patient Safety."

Issue: Bar coding is too expensive.

Reality: The FDA estimates it costs $1,799 per bed to implement a bar code point-of-care (BPOC) system for medication administration and another $1,000 for annual maintenance. However, each adverse drug event (ADE) costs hospitals an average of $2,257, so a single ADE prevention practically offsets the BPOC investment cost for the bed. When you consider the average jury award for medication error cases exceeds $600,000, BPOC systems appear very cost effective. Smaller facilities are discovering that bar code medication administration systems even fit within their budgets—30 percent of hospitals that have implemented BPOC systems have fewer than 150 beds, according to HIMSS.

You can increase and leverage the value of investments in bar coding by scaling systems to include more applications and users. Articles published by healthcare professionals who have adopted bar coding in their facilities reveal that most hospitals go on to implement additional applications.

The IT department can play a powerful, positive role in increasing the value a of a bar code investment by setting technology standards that facilitate scalability and expansion. Features to insist on include support for organizational networking standards, conformance with wireless security protocols and compatibility with legacy HIS systems. IT should also establish a policy of using thermal printers for all bar code, label, and wrist-band printing needs. Thermal printers provide excellent bar code print quality, native support for multiple bar code formats, outstanding total cost of ownership, and flexibility to accept a wide range of label materials, and are adaptable to support many healthcare printing uses. Zebra's white paper "Understanding Print Options for Healthcare Labeling Needs" presents in-depth information to help evaluate and select printers to support patient safety programs.

Issue: We don't need to label medications in house because of the FDA unit-of-use rule.

Reality: To be the most effective and protective of patient safety, bar code medication administration applications should record all medications given to patients. The FDA rule alone is insufficient to ensure all medications will be bar coded. Pharmaceuticals packaged in bulk are exempted from the rule. Compounds, patient-specific IV solutions, and other treatments prepared on site are also outside the FDA manufacturer marking requirements. Hospitals should have an in-house system to provide bar code identification for these exceptions.

Issue: Bar code marking is cost-prohibitive.

Reality: Every hospital with a bar code medication administration system has overcome the obstacle of ensuring medications have a bar code label. (And, as noted previously, approximately 30 percent of adopters have less than 150 beds). To date, they have had to mark most of their own medications. The FDA rule will greatly reduce self-labeling requirements and costs. Bar code printing is especially cost-effective for hospitals that will be implementing systems to meet the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) 2006 National Patient Safety Goal (NPSG) for medication and medication container labeling. Including a bar code on the label adds virtually nothing to the cost, and positions the hospital to gain the benefits of bar code control applications.

Unit-dose bar code marking can be done very cost effectively with thermal printers. They make very efficient use of media, provide outstanding print quality that minimizes waste, and perform very reliably in challenging environments. See Zebra's white paper "Evaluating Print Options for Hospital Bar Code Labeling" for details.

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Issue: How do we know which bar code equipment represents a good investment?

Reality: Following the guidelines below will lead you to bar code equipment that maximizes your investment by providing superior total cost of ownership and a migration path for cost-effectively evolving and expanding applications.

- Use standardized bar code symbologies and data formats; follow other technology and process standards whenever possible.
- Select products that support organizational IT standards for networking, connectivity, and security.
- Use thermal printers to produce all bar code labels and wristbands. Thermal printers are the most flexible and efficient option for meeting multiple hospital bar code printing needs.
- Carefully select label and wristband media and monitor that specified materials are used. Using the optimal media helps ensure the print quality that patient safety applications demand, reduces waste, enhances productivity, and extends the life of the printer. For more information see Zebra's guide, "The Do's and Don'ts of Selecting Healthcare Printing Supplies."

Zebra Technologies is a world leader in bar code, RFID, and ID card printing, with an installed base of more than 4 million units, including systems at healthcare facilities for unit-dose labeling, prescription labeling, patient wristband printing, materials management, asset management, security, and employee identification. Together with its authorized healthcare partners, Zebra has the experience, industry knowledge, and specialized products needed for successful pharmacy implementations. Zebra is also a leader in standards development and actively participates in the work of healthcare industry associations so that it will be prepared to meet the emerging needs of its customers. Contact Zebra at +1 800 423 0442 or visit www.lifesciences.zebra.com for more information about its bar code print solutions for hospitals.

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