

Barcoding 2.0: It's High Time to Improve Patient Safety

Technology advances support better
workflow and higher quality of care



EXECUTIVE SUMMARY

Over the past decade, barcode scanning and printing has become an integral part of patient care and patient safety initiatives throughout the U.S. Or has it? True, the vast majority of hospitals have implemented a barcode system, at the very least for patient identification and medication administration. But the persistently high rate of patient error and adverse medical events clearly indicates that most healthcare systems are not using the technology to its fullest potential. Technology advances – particularly the introduction of innovative mobile ID printing solutions – have made it even easier to seamlessly integrate barcoding into clinician workflow to improve efficiency and enhance patient safety, both critical elements to success in the new value-based healthcare environment.

Tackling the Stubborn Patient Safety Challenge

Improved patient safety continues to remain an elusive goal for the healthcare industry. In 1999, in its groundbreaking report *To Err is Human*, The Institute of Medicine (IOM) estimated that preventable medical errors caused as many as 98,000 deaths and a million injuries annually. Despite numerous safety initiatives in the years since, the numbers indicate little progress:

- A follow-up IOM study in 2006 reported at least 1.5 million preventable adverse drug events – such as the highly publicized medicine mix-up that almost took the lives of Dennis Quaid’s newborn twins – occur each year in our healthcare system.
- Laboratory sample errors cause nearly 161,000 adverse events annually, according to a 2006 report from The College of American Pathologists.
- A study by the Institute for Healthcare Improvement in 2011 found that errors and adverse medical events occur in one-third of hospital admissions – as much as 10 times higher than some previous estimates.
- Surgeons perform the wrong procedure on patients 20 times a week and operate on the wrong person with the same frequency, Johns Hopkins patient safety researchers reported in 2012. They estimated a total of more than 4,000 so-called “never events” – events experts agree should never happen – occur each year in U.S. hospitals.

The original IOM report suggested that barcoding *might* prevent many of these errors – a prophecy proving true, based on a growing body of evidence. The introduction of the **barcode medication administration (BCMA)** concept and subsequent evidence supporting its efficacy is tremendously significant to the industry and the patient.

For example, a study published in *The New England Journal of Medicine* in 2010 reported that using barcode medication administration (BCMA) technology to scan patients and drugs led to a 41 percent reduction in medication errors and decreased potential adverse drug events by more than half. It also reduced documentation errors – in other words, diagnostic errors – by a whopping 80 percent.

A Bit of Barcode History

Barcoding has been slower to catch on in the healthcare industry than in other sectors, such as



retail. The first barcode was scanned on a 10-pack of chewing gum in Ohio in 1974. Within 15 years, retail products from cereal to shoes to household goods sported barcodes. But barcodes didn’t show up on medications until 1991, and it took until 2006 for the Food and Drug Administration to require manufacturers to include them on all medications – more than 30 years after the chewing gum!

Today approximately two-thirds of U.S. hospitals scan most medications at point of administration, up from around three percent in 2001. From a safety perspective, there’s no question that BCMA should be used to verify the Five Rights – the right patient, the right drug, the right dose, the right route and the right time. In fact, hospitals seeking to qualify for federal incentives by meeting Stage 2 Meaningful Use objectives must automatically track medications from order to administration using “assistive technologies” in conjunction with an electronic administration record (eMAR). BCMA can be used to document compliance because it qualifies as eMAR technology.

However, BCMA can provide a false sense of security since it’s just one part of the equation for improving patient safety. “Even a state-of-the-art bedside scanning system can’t alert nurses to medication preparation errors, such as the wrong strength of the right drug,” says Mark Neuenschwander, a leading expert in the field of medication dispensing automation and bar code point-of-care systems.



“ Yet fewer than three percent of hospitals currently use **barcode medication preparation (BCMP) technology** to scan ingredients to ensure that correct volumes and strengths are selected and compounded for IV dispensing. So it’s no surprise that a five-hospital study found nearly 1 in 10 IV products was incorrectly prepared – an error rate close to 10 percent. On the other hand, Amazon scans all its containers and products to ensure they match the orders. Amazon’s error rate? Only .001 percent. ”

Barcoding Beyond Medication Administration

To truly conquer the problem of patient safety, hospitals need to dramatically expand the adoption of barcoding technology into all areas of the hospital, from the patient room to the lab to the pharmacy. Any time providers perform an action on or for a patient, safety best practices dictate scanning the barcode labels with accurate drug-, test- and patient-specific information, then generating a data record entered directly into the patient’s EHR.

Since errors can occur at any point in the care delivery process between admission and discharge, proper identification is critical whether patients are being admitted or operated on, receiving medication or meals, or having something collected from them. For example, incorrectly labeled items such as mother’s milk, blood, stem cells, bone marrow, specimens and biopsies can result in misdiagnosis and improper – even life-threatening – treatment, as in the case of blood transfusion errors. In labs, barcoding samples streamlines management and tracking, improving safety as well as saving

valuable time for lab staff by eliminating the need for substantial manual data entry.

In the pharmacy, scanning enables pharmacists to record that medication has been dispensed and validates the correct medication and dosage against the prescription order. And 2D barcode labels can be printed with infusion parameters for automatic reading by smart infusion pumps, increasing administration accuracy.

Point-of-care Labeling Practices Protect Patients

To encourage hospitals to take a more holistic view of barcoding and patient identification, Neuenschwander, founder of The unSUMMIT for Bedside Barcoding , prefers to use the more-encompassing term **BPOC – barcoding at the point of care** – rather than BCMA.

Barcoding alone does not improve patient safety, he emphasizes. As with seatbelts, the technology helps save lives when systems are well-designed, and used responsibly and regularly. In his view, safe labeling practices provide an essential foundation for the success of any barcoding system.

A number of industry experts including Neuenschwander have identified three components critical to safe labeling practices:

1. **Proximity.** On-demand printing of barcoded labels and wristbands at point of care, which requires mobile printers, ensures that the labels don’t get lost, left behind in rooms after patients are discharged or attached to the wrong items. It also reduces the risk of safety-compromising clinician error resulting from distractions, interruptions and heavy workload.

2. **Readability.** Clinicians are busy. They need to be able to quickly and accurately scan barcodes the first time. Printers need to reliably produce clear, crisp, accurately-imaged and sure-to-scan labels.
3. **Durability.** Barcoded identification labels must be readable throughout the entire duration of a patient's hospital stay, even after repeated scanning. For patients, that requires antimicrobial wristbands that can survive exposure to soaps, solvents, blood and other elements. For medications, label media must also be able to withstand moisture, refrigeration and freezing.

While printers may not typically be viewed as groundbreaking or glamorous components of advanced technology solutions, the fact is that innovative new mobile ID printers have the potential to be patient safety game-changers. Designed to provide on-demand wristband and label printing in virtually any area of the hospital, they can be used everywhere from an admissions workstation to a cart at the patient bedside.

As a result, compact wireless mobile printers are being deployed to support patient safety in a variety of ways, including:

- Quick patient registration at emergency department admission
- Printing labels for point-of-care medication, laboratory, trauma and surgery
- Bedside identification of patients and specimens
- Printing matching mother and infant identification wristbands in labor and delivery
- Identification of breast milk in labor and delivery

Of course, simply having mobile transportable printing capacity available does not automatically promote patient safety. Seamlessly integrating it into workflow is key, encouraging clinicians to view it as a tool that helps them provide safer, more efficient, higher quality care – instead of another administrative burden they need to work around.

The latest advances in best-in-class mobile ID printing solutions make them extremely fast, reliable and easy-to-operate, with plug-and-play functionality. They use thermal print technology to avoid making an imprint of protected patient information, ensuring HIPAA compliance. But unlike standard thermal printers, they take advantage of smart media technology which allows users to load and automatically print



adult, pediatric and infant wristbands and labels of varying width and length without any special set-up or calibration. Wi-Fi, Bluetooth and USB connectivity support speedy, accurate barcode printing that enables clinicians to minimize their interaction with technology and maximize their interaction with patients.

The most effective mobile printing solutions integrate easily with the hospital's existing admission, laboratory information and EHR systems, yet also have the ability to meet patient ID and barcoding needs well into the future.

Take Patient Safety to the Next Level with Next-Gen Barcoding Solutions

Accountable care, declining reimbursement, increasing consolidation and intensifying compliance concerns are among the many factors escalating pressure on hospitals to enhance patient safety and the entire patient experience while also boosting productivity and workflow efficiency.

Faced with competing technology priorities, forward-thinking hospitals are taking a closer look at the promise of barcoding 2.0. Although barcoding outcomes to date may have fallen short of expectations, it's high time to recognize that both the technology and utilization are maturing, providing the opportunity to make great strides toward improved safety, workflow and quality of care – at a fraction of the time and cost investment required for an enterprise-wide EHR implementation.

Concluding thoughts

Improved patient safety continues to remain an elusive goal for the healthcare industry. It's been over 30 years since the first bar code was scanned in a retail store, but healthcare still has a long way to go. Two industry brand leaders, Brother and PDC Healthcare, have joined forces to raise awareness and help clinicians understand the link between bar-code-point-of-care (BOPC) automation and its role in minimizing human error in healthcare.

For more information

To learn more about the connection between bar code technology and patient safety, please email a Brother Mobile Solutions Sales Rep. at MobileSales@brother.com.

For more information on the TrustSense patient ID printer visit their website at www.trustsense.com. And to schedule a demo, call [800-543-6144](tel:800-543-6144).

Acknowledgements

This paper was developed by David Crist (pictured to the right), President, Brother Mobile Solutions. Included is information compiled by Mark Neuenschwander, president of The Neuenschwander Company and a leader in the charge to reduce human error through bedside barcode technology. Special thanks to PDC Healthcare, a leader in patient ID wristband media and Brother Mobile's strategic partner for the TrustSense™ solution.

David Crist is President of Brother Mobile Solutions www.brothermobilesolutions.com, a leader in mobile and label printing technology. He focuses on providing meaningful, cost-effective printing solutions with strong ROI for enterprise and healthcare industries.



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Brother Mobile Solutions, Inc.

Brother Mobile Solutions, a leader in mobile and label printing technology, in partnership with PDC Healthcare, the global leader of innovative identification solutions, launched the new TrustSense™ Patient ID Printing Solution at the HIMSS 2014 Intelligent Hospital™ Pavilion.