



Aurora Relies on Zebra for High Quality Bar Codes at the Bedside

Challenge: Reduce adverse drug events

In the wake of the 1999 Institute of Medicine study, “To Err Is Human,” Aurora Health Care wanted to consider the local implications. So management at the not-for-profit integrated delivery network, which is based in Milwaukee and includes 12 acute care hospitals, extrapolated the findings. To their surprise, they learned that medical errors were taking as many as 3.5 lives on an average day in Wisconsin.

So Aurora took action. Leadership began exploring how to further Aurora’s use of integrated electronic medical records across facilities in eastern Wisconsin to promote quality and protect patients. A core component of that initiative was to use bar coding to prevent and detect medication errors.

“Bar coding is part of a larger patient safety effort, but it’s a multi-stage project on its own,” says Robert Raschke, manager of electronic health record systems and information services at Aurora. “With bar coding and, eventually, CPOE [computerized physician order entry] in mind, we envisioned a closed-loop, integrated point-of-care medication administration system.”

Solution: Part One - Labeling Pharmacy Medications

As the first phase toward realizing this vision, Aurora determined that the value of any bar coding effort would be directly proportional to the percentage of medications properly labeled. In fact, their goal is to label 100 percent of medications. This objective called for on-demand bar code printing in a wide variety of settings. While some smaller Aurora facilities might demand an average of 6,000 to 25,000 bar code labels per month, larger sites may need to print more than 50,000. Aurora needed printers that were appropriate to the volume demands of their varying sized hospitals. They also placed a priority on finding printers that would integrate smoothly with an existing pharmacy information system from Cerner.

Aurora chose Zebra Technologies after carefully considering general research findings, reports from their information systems vendors, and their own positive experience using Zebra printers to track radiology files. Deploying a combination of Zebra’s S600™ and Xi™ series printers, the IDN introduced bar code labeling in the pharmacy at Aurora Sheboygan Memorial Medical Center in February 2003 and soon expanded it to 10 additional hospital pharmacies.

“These are thermal, on-demand printers,” says Raschke. “They create dense, high-quality symbols that carry more than enough information. Plus, the output survives the rigors of hospital life, achieving the high read rates necessary to streamline labeling in the pharmacy and scanning on the floors.”

As Aurora transitions to a centralized medication re-packaging operation for all hospitals, it will continue to use Zebra printers for those medications and preparations, such as patient-specific IVs, that require unit-dose labels be printed at the local level.

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Solution: Part Two - Bar Coded Wristbands for Accurate Patient Identification

A complementary phase of the initiative required introducing bar coded patient wristbands. Aurora needed durable, easy-to-scan wristbands that would allow caregivers to accurately identify patients at the point of care and verify the “five rights” of medication administration: right patient, right medication, right dose, right time and right route. As part of their commitment to maximizing patient comfort, Aurora wanted the wristbanding program to be as non-disruptive as possible. As poorly-constructed, difficult-to-read wristbands can contribute to an impersonal, institutional atmosphere, this thinking had a major influence on the choice of wristband and symbology used.

Aurora standardized on the two-dimensional Aztec Code symbology because it can encode large amounts of data and it makes scanning less obtrusive. Aztec Code works well on a curved surface and can be repeated around the length of the band for easier access to the reader, requiring less re-positioning by the nurse to get a scan.

For added flexibility, Aurora also incorporated one-dimensional or linear bar codes on their patients’ wristbands. These simpler codes would allow clinicians to use existing scanners that already supported glucose readings, specimen collection, and other types of point-of-care testing.

Again, thermal printers provided the best combination of image resolution and durability. In addition, thermal printers produce wristbands on demand, or one at a time. Laser printers, by contrast, require users to print an entire sheet of labels at once, which can cause unnecessary waste and expense.

Aurora chose a print solution from Zebra that included Zebra wristbands as well as the TLP 2844-Z™ wristband printer. To help streamline workflow for staff, the health system is working with Zebra to establish a simple method for printing multiple wristbands at once. In the maternity ward, for example, nurses must print four wristbands—two for the infant and one for each parent. By generating all four labels on the same sheet, staff members can save time, avoid hassle and increase overall efficiency.

Results: Safer, More Efficient Care

After deploying a variety of bar code printers, Aurora was able to equip each pharmacy and admissions area with printers suitable to their particular workflow and volume requirements. “We’ve been able to maximize our return on investment,” explains Raschke, “because we don’t have printers sitting idle.”

Bar coding at Aurora has improved their method of processing the charge credits resulting from medications returned to the pharmacy. In the past, staff would have to manually key an order number or patient name into the pharmacy information system to apply a credit. With ubiquitous bar codes, staff can quickly scan the medication and return it to inventory, saving time and avoiding mistakes in the process.

Most notably, with medication labeling and patient wristbanding initiatives in place, Aurora will soon begin to implement bedside bar code medication administration. As medication administration goes live throughout the enterprise, Aurora will be well positioned to prevent the vast majority of medication errors. It will also have a solid foundation upon which to introduce future patient safety initiatives such as CPOE, a further benefit to quality care at Aurora.



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