Five Ways

to Improve Patient Safety with Barcode Technology

Accurate patient identification is a key priority for healthcare providers when it comes to patient safety. Correctly matching patients with their medications, chart, and care plan is critical to avoid adverse drug events (ADEs) and other preventable medical errors.

In 2006, the Institute of Medicine (IOM) found that at least 1.5 million preventable ADEs occur each year in hospitals, long-term care facilities, and outpatient clinics. Those mistakes cost billions of dollars and thousands of lives. That is why the Joint Commission's National Patient Safety Goals (NPSG) have included accurate patient identification since they were established in 2003, and why the U.S FDA requires unit-dose barcode identification on medications dispensed in healthcare facilities.

Barcode technology has been deployed in healthcare facilities for patient identification, nurse ID badging, medication administration, specimen tracking, IV mixing, blood product tracking, chart/file tracking, and other applications. Automated medication administration processes are also required under Meaningful Use Stage 2, and while barcode scanning isn't specifically required, it is one of the most common methods of electronic tracking for this type of application.

In a typical scenario, the patient is given a barcoded wristband at the point of admission. The wristband is scanned at the bedside to confirm identity at the point of care and before each procedure or treatment. Those scans open the patient record in a central database that includes indications, advisories, and restrictions or allergies. By requiring the clinician to scan their own ID badge, the patient wristband, and any medications or specimen labels, the provider can ensure accuracy of care and maintain a time stamped record of all care received.

The goal in all of these cases is to ensure that the patient receives the right medication and other treatments. A barcode scanning system implemented at Brigham and Women's Hospital in Boston

helps prevent 90,000 serious medication errors each year, according to research published in the New England Journal of Medicine. The system resulted in a 41 percent reduction in administration errors, and a 51 percent drop in potential adverse drug events. A separate study by the U.S. Veteran's Administration found that barcoded wristbands and medication administration reduced the incident of medication errors by 86.2 percent. The FDA's own research concluded that increased use of barcode-based bedside medication administration systems alone will prevent 500,000 adverse drug events and blood transfusion errors over 20 years, keeping an estimated $93 billion in treatment costs out of the healthcare system.

As the healthcare sector focuses even more intensely on outcomes and patient safety, barcodes will play an important role in ensuring the accuracy of the care provided in healthcare facilities. Below, we've described five areas in which the use of barcoded patient identification solutions can improve patient safety.

1 Admissions

The safety improvements begin as soon as the patient is admitted to the facility. Admission staff can record all of the patient's information in the barcode application and instantly create a wristband and accompanying labels for additional paperwork, specimens, and other items.

By integrating this process with kiosk- or tablet-based check-in procedures, the entire admissions process can be greatly accelerated, while ensuring correct identification of the patient during the care process.

Staff throughout the hospital can access patient information by scanning the wristband so they know they have the right patient, and be alerted to any special conditions, allergies, or other information that will directly affect patient care. Additional scans during care transitions help document treatment and update the patient chart automatically.

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② Point of Care

Nurses and other clinical staff can use fixed or hand-held barcode scanners to scan the patient wristband and chart to verify they have the right individual. They can also use those scans to view and update the chart, access the care plan, add notes to the chart, and share that data with a central medical database.

Staff can be automatically alerted if the care plan is not being followed. The scans also help time and date stamp all procedures, which helps ensure that records are updated and all procedures can be accurately billed and reimbursed.

Scanners can also be used to match medications, IV or blood transfusion bags, specimens, and food trays with the patient. This can help avert the most common types of harmful medical errors, further improving the patient's safety and care outcomes.

③ Medication Administration

Of all of the benefits of automated patient identification, medication administration is probably the best known. By scanning the patient wristband and medication at the point of administration, providers can ensure the patient's "Five Rights": the right medication, right dose, right time, right patient and right route. The most common medication errors involve dispensing medications at the wrong time or omitting a dose (according to a 2002 report from the Archives of Internal Medicine).

By taking advantage of barcoded pharmaceutical packaging, hospitals enable nurses to scan the medication and the patient wristband at the bedside, confirming the medicine, dosage, and timing. These systems can also be configured to send automated alerts if a dose is at risk of being late or missed entirely.

In facilities with secured pharmaceutical dispensing cabinets (or smart cabinets) those barcodes provide a further check by requiring a successful scan of the patient chart and the medication before releasing the drugs to the nurse.

In the pharmacy, barcode matching ensures the right drug is dispensed in the first place, while also automatically tracking inventory and alerting staff when drugs stocks reach a predetermined level. That allows for prompt reordering of inventory so that staff always have access to the medications their patients need.

4 Specimen Collection

Just as medication errors can lead to dangerous medical errors, so too can mismatched specimens. If the wrong blood sample is matched to a patient, for example, it could lead to misdiagnosis, implementing the wrong treatment, or failing to recognize a serious condition or complication.

When specimens are collected from the patient, they can be labeled, scanned, and linked to the patient wristband barcode via scanning. At the lab, personnel scan those barcodes to verify the sample is associated with right patient, and link the results to the patient's medical record automatically.

Using barcodes in the lab also improves accuracy and efficiency so that tests can be conducted more quickly and results communicated more effectively to clinicians. That results in more timely care, in addition to accurate specimen tracking.

Barcoding can also reduce duplicate testing and the need for re-draws, as well as improving accuracy and saving time for laboratory staff.

5 Materials Management

Manually tracking materials and supplies not only eats up time for the materials management staff, but also requires nurses and clinicians to keep track of supplies. By using barcodes, hospitals can link material usage to specific patients or staff members, reduce the amount of time required to document material consumption, and help ensure that the right supplies are always available by automatically managing inventories.

This improves patient safety by making sure needed medical supplies are available for care, and by reducing distractions for nurses, physicians, and other staff members.

Conclusion

The U.S. FDA estimates that purchasing barcode equipment and training staff on the technology could cost the healthcare industry roughly $53.1 million, but would result in 413,00 fewer ADEs in the next 20 years and avoid related hospital stays, saving an estimated $41.4 billion.

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