Using Bar Codes to Reduce Medical Errors

By placing bar codes on individual, unit-of-use packages for medical devices and pharmaceuticals, manufacturers can take part in a movement intended to reduce the number of errors caused in hospitals and pharmacies.

Errors at medical facilities have reached alarming numbers. The Institute of Medicine (IOM) reports that medical errors kill between 44,000 and 98,000 people a year in hospitals alone. A 1997 article in the Journal of the American Medical Association cites a study at two prestigious teaching hospitals that showed that 2 out of every 100 admissions involved a preventable adverse drug event. While not all of these errors resulted in death or disability, the study reported that they increased hospitals’ cost by an average $4,700 per admission, or about $2.8 million annually for a 700-bed teaching hospital. And IOM feels these estimates are modest.

A number of solutions have been suggested. Develop more-user-friendly medical devices and drug delivery systems. Institute a no-fault policy for adverse-event reporting. Automate hospital processes in order to minimize the possibility of human error.

Healthcare product packagers have an opportunity - and perhaps an obligation - to participate in this last solution. One of the staples of automation is automated identification - having a computer decipher product identity - through the use of bar codes.

Manufacturers already bar-code most shipping cases and bulk packages or master packs. According to a 1997 report commissioned by the Supply Chain Committee of the Health Industry Distributors Association (HIDA) on the status of bar-code use and implementation in the medical/surgical industry, nearly 70% of all cases and 77% of all master packs bear industry-standard bar codes.

However, the percentages for individually packed products, typically called unit-of-use packs, unit-dose packages, or eaches, lag far behind those of cases and master packs. Only 26% of eaches bore industry-standard bar codes in 1997. HIDA will release a new report this year.
Al Schwindt, director of pharmacy at St. Alexius, indicates that “robotic technology was implemented to assist in virtually eliminating dispensing errors, since the robot assist in producing identification at the point of dispensing drugs. Because manufacturers do not prepare all their products in robot-ready packaging, which is barcoded and includes product identification, lot number, and expiration date, the medical center prepares its own packaging, because of the risk management program in the institution”. According to Frank Kilzer, director-materials, the hospital’s central supply and purchasing with bar code technology, has reduced to the point that inventory losses are less than 1%, compared with a national average of 15 – 20%.

The financial impetus for bar coding products may affect demands placed on the drug and device manufacturing industries. “We would like manufacturers to put standard bar codes on everything,” explains Roger Pierce, director of the Department of Veterans Affairs’ (VA) consolidated mail outpatient pharmacy (CHOP) in Los Angeles. Pierce’s CHOP facility, which fills about 17,000 prescriptions for refills and maintenance drugs per day, relies upon barcodes to move products through the prescription-filling process. “Because we are operating at such high volumes, we need mechanisms for reducing errors. Bar code scanning verifies that the right product is being channeled to the right customer through our automated systems. Humans can take shortcuts especially when working quickly and for long hours. The use of bar codes reduces the possibility of those errors.”

VA’s prime vendor, AmeriSource, has agreed to work toward putting bar codes containing universal product number (UPN), expiration date, and lot code on everything it supplies to the VA, says Pierce. “The CMOP directors would like them to do it even if the manufacturers don’t.” But he says that he’d prefer it if manufacturers were to place standard bar codes on unit-of-use packages from the very beginning.

The VA has also brought bar coding right into its hospitals. The first hospital in the VA system to implement a bar code scanning system at the point of care was the Topeka, KS, Colmery-O’Neil VA Medical Center five years ago. “Nurses, patients, and products are all bar coded,” says Pierce. “Anything that doesn’t match sounds and alarm.” Tracy Eddy, the pharmacy supervisor on staff at the hospital, states that the hospital ideally purchases unit-dose liquids or controlled substances already bar coded from the manufacturer or distributor. “But for solid oral-dose medications and some liquids, we still need to bar code the unit doses," she says.

**TAKING THE FIRST STEP**

In some ways, the healthcare industry is at an impasse. Hospitals, which are often struggling just to survive in an era of managed care, reduced reimbursement and increased services demand, are reluctant to spend the money it takes to implement an automated system, especially if most of the devices and drugs they receive do not carry bar codes at the unit-of-use level.

Many Hospitals and pharmacies have implemented their own bar coding systems, using systems from Pyxis or Accu-Chart Plus Healthcare Systems, Inc. (Hoffman Estates, IL). Tim Cloninger, President of Accu-Chart, strongly suggest that hospitals carefully examine all of the operational costs associated with each system that is being evaluated. “The benefits of a true unit-dose system with bar code technology are great. Every medication – solid, liquid, injectable, etc. – needs to be in a unit-dose form with a bar code on each item to achieve maximum accuracy and efficiency. If all of the drugs are not barcoded, you open the door for mistakes to be made.”

![Bar Code Supplement](image)

These liquid Unit Dose packages were produced with the **Wet Cadet**

![Unit Dose medications can be bar coded for point-of-care scanning.](image)

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These solid Unit Dose packages were produced with the **Cadet Twin**.

Even single tablet packs can be bar coded.