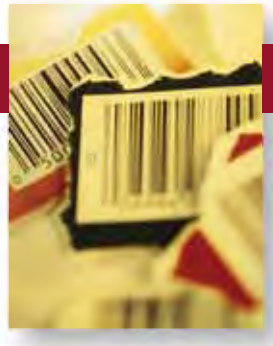


Two Approaches to Bar Coded, Unit Dose Packaging

IT HAS BECOME COMMON KNOWLEDGE THAT BAR coded, bedside medication verification will improve patient safety in today's health systems, and in recent years, technology vendors have released many products to help health care providers find a means to that end. However, the implementation of the technologies and processes necessary to achieve this ambitious goal is no less intimidating a task.

Although the bar coded medication administration process culminates at the patient bedside, it starts in the pharmacy, with the packaging of medications into bar coded unit dose. From system selection to establishing packaging policies and procedures, there are many considerations to make in determining your pharmacy's program for this vital activity. On the following pages, two pharmacists from distinctly different hospitals outline their processes and practices for the implementation and use of automated unit dose packaging systems. Their successes and lessons learned serve as potential road maps for other pharmacies embarking on the journey towards bar coded medication administration.

Photo courtesy of McKesson Automation

THE BIGGER PACKAGING PICTURE

By Michele Weizer, PharmD, BCPS

Located in Atlantis, Florida, JFK Medical Center is a 424-bed, HCA affiliate community hospital, and in October 2004, became the first to use a high-speed, unit dose packaging machine (McKesson Automation's PACMED). We currently dispense nearly 9,000 doses per day.

PACMED packages our oral solids in unit dose and labels them with an NDC-specific bar code. We chose to use an NDC-only bar code, as that is the only information our Meditech EMAR system will recognize. We either manually package our oral liquids in unit dose, or buy them already packaged. In terms of syringes, ampoules, and other single-use items, we buy pre-bar coded items, or affix to them bar coded Avery labels, created using our Meditech pharmacy system. To multi-use items like creams, ointments, and eye drops, we attach McKesson tadpole labels, which nurses can scan with each administration.

System Features

At the time of system selection, we found that PACMED integrated easily with our existing systems, including our Meditech pharmacy information system and our McKesson AcuDose-Rx automated dispensing cabinets. PACMED also had a 500-line-item capacity, allowing us to stock nearly 95% of our oral solid inventory in the machine. PACMED helps us manage our inventory with "below par" and expired medications reports. In addition, the system alerts us if we attempt to package medications that will soon expire, and via an interface with our AcuDose-Rx cabinets, will package medications – on demand – that have fallen below par levels in the cabinets.

Implementation

With PACMED's 500 line-item capacity, part of our pre-implementation process was to determine the machine's formulary. I analyzed a year's worth of drug-utilization data, and considered any drug that was ordered more than 30 times a month for the formulary. Then I compared wholesaler prices for bar coded, unit dose drugs to the packaging costs we would incur per dose. Surprisingly, I found it cheaper to buy some drugs pre-packaged. Initially, we assigned 260 of the PACMED's canisters, and have since added six to 10 line items per quarter to the machine, as our hospital's formulary or unit dose product availability changes.

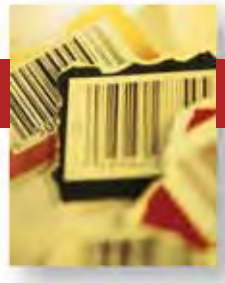
To help ensure a smooth implementation, I recommend site visits. By observing your peers' practices, policies, and procedures, you will learn how to better apply the new technology to your operation.

Workflow Improvements

Since implementing PACMED, the time spent manually picking items to refill our AcuDose-Rx cabinets has dropped from eight to two hours a day, because the machine automates 80% to 90% of the refill process. We have added a full-time technician to our staff who performs all of our packaging functions, runs the equipment, manually packages necessary doses, and verifies that the bar codes we send to the nursing units can be scanned at the bedside. The packaging technician FTE was transferred from a staff technician FTE position.

QA Processes

The more manual processes you can eliminate from your packaging operation the more accurate it will be, but quality assurance (QA) measures are also necessary when using technology. You can do a great job of packaging medications, but if the bar codes on the packages are not attached to a drug in your information systems, the nurses cannot scan them at the bedside. All medication bar codes are verified daily, upon delivery from the wholesaler, by the packaging technician. If a medication bar code is not linked in the pharmacy information system, a pharmacist must make the link. It is necessary to establish QA procedures for your IT infrastructure to ensure that each bar code on your unit dose packages is linked to a drug in your system.



Bar Coded

These duties can become the responsibility of your pharmacy's automation or informatics specialist. Many hospitals are creating pharmacy informaticist positions, because so many of the department's activities and medication safety processes surround automated systems. As the pharmacy automation manager, I spend roughly half of my time overseeing our packaging operations and the automated processes related to our medication delivery system. The other half I spend on pharmacy clinical management. I also served as the EMAR project lead for JFK Medical Center, in addition to overseeing the pharmacy's automation equipment and bar coding processes.

Looking at the Big Picture

When determining your facility's packaging processes, first examine your medication delivery system. Packaging cannot be just a pharmacy decision. Involve all the members of your steering committee or project team to determine how you will deliver medications to patients. Bar coded medication administration will change multiple processes at your facility, and will affect your medication delivery system from start to finish. Before selecting a system, be sure to consider the size of your facility, your patient population, and your nursing practices. For instance, if your facility serves a significant number of pediatric patients, your pharmacy will dispense a lot of individualized doses. Therefore, the devices you use to package medications in bar coded unit dose must be able to meet those patients' needs. Look at the bigger picture, before deciding which packaging methods are best for your facility.

Patient Safety: The Ultimate Goal

Patient safety is very important to our facility. In fact, the latest HealthGrades Quality Study, published in April 2006, recognizes JFK Medical Center for its patient safety efforts. When a facility implements bar coded medication administration, they are not doing so to save money or time; you implement this kind of system to improve patient safety. You would have to live under a rock to not see how much the patients – and your caregivers – value that.

Michele Weizer, PharmD, BCPS, has been the pharmacy automation manager at JFK Medical Center since 2004. Previously, she served as the director of pharmacy at University Hospital and Medical Center in Tamarac, Florida, also an HCA affiliate. Before her tenure with that facility, she served as a clinical pharmacist at JFK Medical Center for 10 years. The recipient of a doctorate from the University of Florida, Weizer completed her residency in clinical pharmacy at Shands Hospital, and is board-certified in pharmacotherapy.

WHERE TO FIND IT:

McKesson Automation ..... **Circle reader service number 74**
or visit www.mckessonautomation.com

PACKAGING PRACTICES AT A SMALL COMMUNITY HOSPITAL

By Bill Arrington, DPH

Stillwater Medical Center, in Stillwater, Oklahoma, is a 120-bed, city-owned, not-for-profit hospital that also operates a rehabilitation center and skilled nursing facility, and owns or manages several physician practices. The pharmacy has been bar coding its unit dose medications for about three years, and our hospital has been using IntelliDOT's CAREt system – we were the alpha test site – for bar coded bedside medication verification and administration for just over two years.

In developing our program for bar coded medication administration, patient safety was the number-one issue. We also plan to use the system to help us bill on administration, an initiative we are currently working towards in order to achieve more accurate billing for our patients. In fact, the bar codes on each unit dose package reflect those billing codes, rather than the NDC numbers for each drug. Because we need to enter the billing codes into our IntelliDOT formulary anyway, we did not need to add a step to our process, and it is helpful to have the same bar code value on each dose of the same drug, regardless of the manufacturer. In addition, the Auto-Print tracks information regarding each packaging batch. So if there is a recall, we are able to locate that particular batch and easily remove it from our inventory. In addition, the six-digit hospital bill code is also common to Meditech (our hospital information system) and our Pyxis cabinets. This commonality helps ensure accuracy across our various computerized systems.

Packaging Systems

We use the Auto-Print II from Medical Packaging Inc. (MPI) for packaging tablets and capsules. Prior to using that system, we had been manually packaging doses in blister packs, but we have found that nurses prefer the Auto-Print's packaging. They find it easier to open and the machine's capability to print larger fonts and tall-man lettering is helpful to them at the bedside. For syringes, vials, or ampoules, we use a software package developed by our Louisiana-based wholesaler that generates thumbnail-sized bar coded labels.

System Selection and Implementation

As a small hospital, we were on a tight budget, and when IntelliDOT representatives introduced us to MPI, we were pleased to work with them. To ensure a smooth implementation, we built two extensive bar code databases, or dictionaries: one for our IntelliDOT system and one for the AutoPrint. In those dictionaries, we linked the drugs' NDC numbers to six-digit, hospital-specific billing codes.

Packaging Practices and Process Improvements

Generally, our technicians perform the packaging and a pharmacist verifies their work by carefully examining the packages and the information printed on them. The pharmacist also inspects the packages to ensure they have been properly sealed. In extremely rare instances, we find an empty package or a package with two doses – the result of the Auto-Print being improperly loaded. However rare these instances, it is best to inspect each package before releasing it to inventory.

When we build a new drug into the Auto-Print database, we also build it into the IntelliDOT dictionary. And after running a test batch, we ensure that our nurses' handheld devices can scan the bar code printed by the machine.

We have found it best to allow only one bulk bottle in the packaging area at one time. If multiple bulk bottles are present, there is a higher chance of an entire batch of improperly packaged and labeled drugs making it to our patient care areas, which could lead to difficult-to-detect medication errors.

Photos courtesy of MPI

Best Purchasing Practices

At first, we thought we would mostly purchase bulk medications and repackage them ourselves, because the Auto-Print generates unit dose packages relatively quickly. However, after analyzing costs, we found that it is sometimes cheaper to buy unit dose medications already packaged by the manufacturer. So, when it makes financial sense, we do just that. It can also be safer to buy manufacturers' prepackaged bar coded unit dose products because of the intensive QA processes inherent in the manufacturers' packaging operations.

In the past two years, we have also found that more and more products are bar coded at the unit dose level directly by the manufacturers, particularly ampoules and vials. Our ability to purchase about 90% of our drug inventory in bar coded unit dose has had a positive impact on efficiency and patient safety. Prepackaged doses save us the time and effort associated with packaging, and rid us of the risk of mislabeling doses during the packaging process. However, there is one drawback: manufacturer bar code symbologies are not yet standardized. Our IntelliDOT bar code readers have been able to read all of the bar codes we have received from manufacturers thus far, but the nurses' scanning technique has to be modified for certain codes. As such, we realize the most efficiency benefits with linear bar codes, such as those applied to our packages by the Auto-Print.

Going Forward

The MPI system has been very reliable. Furthermore, the WinPak software is easy to work with. We have been very pleased with the support we receive from Medical Packaging Inc. In fact, we have considered adding their PALP (Pharmacy Accessory Label Printer) to our bar coding operations, for labeling ampoules, vials, syringes, and suppositories or any other unit of use product not bar coded by manufacturers. ■

Bill Arrington, DPh, is the director of pharmacy at Stillwater Medical Center, where he has worked for over 29 years. He holds a B.S. from Southwestern Oklahoma State University.

WHERE TO FIND IT:

Medical Packaging Inc. ..... **Circle reader service number 73**
or visit www.medpak.com

IntelliDOT Corporation ..... **Circle reader service number 69**
or visit www.intellidot.net

Sources for Bar Coded, Unit Dose Packaging Equipment:

Vendor	Reader Service	Website
Accu-Chart Plus Health Care Systems, Inc.	72	www.accu-chart.net
AutoMed, An AmerisourceBergen Solutions Group	68	www.automed.com
Cardinal Health	71	www.cardinal.com
McKesson Automation	74	www.mckessonautomation.com
Medical Packaging Inc.	73	www.medpak.com
Medi-Dose, Inc.	67	www.medidose.com
Omnicell, Inc.	70	www.omnicell.com
Pearson Medical Technologies	66	www.pearsonmedical.com
Swisslog Healthcare Solutions	65	www.swisslog.com
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