

## Case Study



# Leveraging Manufacturer Bar-coded Unit Dose Medications Throughout the Distribution Process

### At a Glance

IU Health Bloomington Hospital  
 Bloomington, Indiana  
[www.iuhealthbloomington.org](http://www.iuhealthbloomington.org)

### Solution Spotlight

- AcuDose-Rx®
- Anesthesia-Rx™
- Automation Decision Support™, powered by Horizon Business Insight
- Fulfill-Rx<sup>SM</sup>
- Horizon Admin-Rx™
- Horizon Meds Manager™
- McKesson Connect™
- MedCarousel®
- NarcStation™

### Results

- Improved in-patient turnaround times of 14 minutes for routine doses and 7 minutes for stats.
- Reduced stock outs from 15 to 11 or 12 per day.
- Nursing med selection errors reduced by 84% and missing doses improved by 83%
- Significant savings—more than \$6,000 annually—on the top 25 oral solids by purchasing pre-bar-coded, unit dosed from manufacturer
- Reduced in-house resources (people) devoted to preparing and checking, and packaging expenses
- Increased job satisfaction for staff

### Overview

IU Health Bloomington Hospital, a part of Indiana University Health serving south central Indiana, holds Magnet designation as well as Primary Stroke Center certification and is known for Cancer and Cardiology services. The hospital has been recognized as one of the nation's Most Improved in *Hospitals & Health Networks* 2010 Most Wired Survey.

In the last five years, the 355-bed hospital has transitioned from a manual distribution system featuring bins on shelving units to a fully functional automated decentralized medication distribution model where over 2,500 orders are processed daily. Over one million medication doses are dispensed annually. According to Michael Melby, MS, FASHP, Director of Pharmacy and Clinical Informatics, "We operate under a fully decentralized model where the nurses access AcuDose-Rx automated dispensing cabinets on the patient care units to get over 90 percent of the medications needed for first doses and maintenance medications for their patients."

Bar-code scanning is integral to pharmacy operations, starting with medication orders, which are automatically transmitted and received through Fulfill-Rx from McKesson's pharmacy distribution center. "Our daily delivery is quarantined in a location segregated from the two MedCarousel systems until we bar-code scan check every dose of every product that comes in. We want to identify any unrecognized or unreadable bar codes down in the pharmacy instead of on the patient care units. Medications are

scanned into the MedCarousels and pick stations, are scanned again upon dispense in the pharmacy and are scanned into the AcuDose-Rx cabinets on the floor."

"We are very pleased that we are 100 percent bar coded in our central pharmacy and our ultimate goal is to be bar-code scanning at every step of the medication use process," said Melby. "We had made the case that bar coding is important from a medication safety standpoint and is the standard by which Bloomington Hospital should be performing all drug distribution and medication administration activities. One of the initial decisions that needed to be made was whether to bar code those medications ourselves or buy them pre-packaged and pre-bar-coded from the manufacturer."

### Challenges

"Like most pharmacies, we are not resourced to support a substantial in-house packaging operation. I would rather utilize my personnel to fulfill other patient-related objectives than packaging, which is not our core business."

The hospital first looked at availability using data from its MedCarousels and found that 86 percent of the doses dispensed were available from the manufacturer in pre-packaged unit dose form. With a high percentage available, their analysis turned to cost. "The consensus was that it must be a lot cheaper to buy in bulk and label it yourself than buy pre-bar-coded pre-unit dose packages from the manufacturer. It's true that the average bulk average

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*"I was surprised we weren't paying a premium for purchasing pre-packaged in bulk and I redirected those personnel that I would have expended to do the quality control, packaging and checking in better ways. I'm ahead both in personnel and in costs."*

**Michael Melby, MS, FASHP**

Director of Pharmacy and Informatics  
IU Health Bloomington Hospital

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acquisition price is 6.5 cents lower, but after doing the internal assessment we found that buying in bulk and packaging in-house actually costs 7.5 cents more per dose when you take into consideration all related costs (labor, equipment, supplies and inventory). We then analyzed our top 25 dispensed oral products and found that the difference per tablet/capsule buying manufactured in unit dose put us \$6K to the good when just considering the packaging media cost, which was quite surprising. After realizing we were not paying a premium, we made the decision to buy as much as we could from the manufacturer."

**Answers**

There are safety advantages that come with buying pre-packaged unit dose from the manufacturer. All liability rests with them and there are additional quality controls placed on them by the Food and Drug Administration (FDA) and Current Good Manufacturing Practices (CGMP). The American Society of Health System Pharmacists (ASHP) is now calling for manufacturers to include additional information to fit NDC and lot number, and expiration date on unit dose and injectable drug packaging. Manufacturers would be able to do this if they moved to the two-dimensional rather than the linear bar codes. Clearly this would be a huge advantage for manufacturer packaging that you will not receive by packaging yourself. Pre-packaged unit dose packaging is smaller than bulk and offers greater storing capacity in dispensing machines. "A big safety feature is that manufacturer packaging doesn't look the same, so if you have open matrix drawers in your automated dispensing equipment and something gets moved to another pocket, you'll know it."

"There are challenges—we have no control over packaging formats, some manufacturer packages are difficult to open or scan and there are shortages and substitutions sometimes. And with less than 100 percent

availability of pre-packaged unit dose medications, in-house packaging and labeling requirements cannot be completely eliminated when supporting BCMA," Melby cautions. "But the benefits far outweigh any negatives. Since converting to a fully decentralized distribution system, in-patient turnaround times are between 13-18 minutes for routine doses and about 7 minutes for stat turnaround times. Our technician cabinet error filling rate is 0.001 percent (10 errors in 1M doses filled), and we're down to about 11 or 12 stock outs a day with overrides at less than 1 percent."

And by maximizing their use of manufacturer bar-coded unit dose medications, pharmacy has greater control over inventory, improved workflow and reduced time spent on packaging. "We've been able to redeploy pharmacy staff that I would have expended to do the quality control, packaging and checking into other functions throughout the hospital, which has improved job satisfaction. I am ahead in both personnel and in costs."

The pharmacy orders 70-80 line items per day from the distributor. "Prior to us using Fulfill-Rx and McKesson Connect to place our orders, it would take the technicians 60 to 90 minutes walking the shelves. Now, it literally takes two minutes. And it takes about 45 to 60 minutes to put away the bar-coded medications from the distributor."

For IU Bloomington, the bar-code-based closed-loop process has significantly reduced errors, saved time and improved patient care. "Time spent tracking down missing meds and calling the pharmacy has gone from 60 minutes to 5 minutes per shift, per nurse. Nursing selection errors have fallen 84 percent and missing doses have seen an 83 percent improvement, from 150 to 25 missing doses per day. The net result is that time spent with patients and documentation activities has increased by 17 percent and nursing satisfaction has gone from 77 percent to 91 percent post-automation."

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