As the need for bar coded medication administration (BCMA) becomes an increasing reality for many hospitals, choosing the best route to bar code and unit dose your drug inventory can be a significant challenge. To accomplish this, pharmacy has three primary options available to them: purchase medication from the manufacturer already in bar coded unit dose, buy the necessary equipment and repackage in-house, or outsource repackage to a vendor. Deciding which option or combination of options is the most cost effective and efficient for your pharmacy can be challenging, and finding the right solution can often come down to trial and error.

To prepare for the implementation of BCMA, Hospital Corporation of America (HCA) in Richmond, Virginia decided to purchase as much medication as we could already bar coded from the manufacturers. However, we still needed to repackage a decent amount of our drug inventory. After taking several different approaches to repackage over the years, HCA has come to the conclusion that the best repackage proposition for us is to use outsourcing as a sole solution. The HCA Capital Division health system comprises 15 acute care facilities for a total of approximately 3,700 licensed beds, and had an average daily census of 1,684 in 2008. That same year, the health system administered 12,295,011 doses via BCMA, with an average medication scan rate of 96.53. Of those doses administered, around 25% needed to be repackage.

HCA’s Repackaging Evolution
In 1999, HCA began the move toward implementing BCMA at all of our hospitals. The first step in this process was investing in technologies to achieve a centralized drug distribution system. Not long after doing this, we decided to “insource” to satisfy our repackage needs. Starting in 2000, we contracted with a vendor to repackage within our facility and they supplied the equipment and the labor. Since we were trying to install a new system, but lacked the expertise, technology, and manpower to do it ourselves, this approach seemed, at the time, the most efficient way to accomplish our goals. While we found the insource model easy to implement and we were able to get up to speed and meet our bar coded medication demands, we soon discovered that insourcing was not likely to be sufficient to sustain our future needs. The primary issue was the lack of flexibility with this model: For example, if you set up a contract to package 100 doses a day, but you only ended up needing 25, you still have to pay for 100.

After insourcing for about a year, we became confident that we could develop the expertise and manage the repackage process ourselves safely and efficiently. We invested in the necessary resources and employed the do-it-yourself (DIY) model from 2001 to 2005. At the beginning of this period, we were convinced that we could easily meet the repackage needs of our entire health system, and it took about...
two years of doing repackaging in-house to realize that while we could do it, it was a very labor-intensive model. Having pharmacists involved in the checking process was an expensive labor cost, and it also meant we were not using a valuable resource effectively.

We took our first stab at outsourcing in 2003: That year we only contracted out a small portion of our repackaging—outourcing just our high-volume products and focusing our in-house efforts on smaller runs and more complicated items such as controlled substances. In 2004, we increased our repackaging volume so that we were outsourcing around 40% of our repackaging. Then, in 2005, we decided that we wanted to start outsourcing the vast majority of our repackaging. We brought on a second vendor since the first vendor was not able to handle the increased repackaging volume, and in 2006 this second company became our sole outsourced repackaging provider, managing 90% of our unit dose repackaging needs. (See Figure 1.)

The experience we had with the first vendor helped us realize the importance of putting the time, energy, and due diligence into selecting the right vendor. We initially chose somebody who only had the capability to focus on one area for us, so with our second vendor, we made sure to pick one that could meet all of our needs. In 2007 and 2008, less than 3% of our repackaging volume was done in-house. This small percentage included slow movers, certain antibiotics and oral chemotherapy agents, and controlled substances. Although our outsourced vendor could do these, there are tighter regulations around these drugs and the process is a little more intensive, so in some cases it makes sense to do it yourself.

**Making the Decision to Outsource**

When trying to decide how to approach repackaging, pharmacy first needs to assess its needs. Outsourcing provides a lot of flexibility for both small and large hospitals and health systems: You are not investing in capital equipment; you are not signing long-term lease agreements; you are contracting with a vendor to package as needed or on demand. However, outsourcing may not be the right solution for every pharmacy. For example, if your pharmacy has already invested the capital in repackaging equipment and you are packaging a lot of drugs that are being shared within a health system or large organization it may be costly to switch. It comes down to deciding what best fits the needs of your pharmacy.

When evaluating whether to outsource our repackaging needs, as with many decisions, it came down to costs. To scale our repackaging operations to where we needed to be, we were going to have to invest more capital, which meant building a larger area and bringing in more equipment. When looking at the operating and labor costs associated with in-house repackaging, we realized these could be reduced through outsourcing. The most expensive piece of repackaging in-house was labor cost, as we were using pharmacists to check the repackaging. Our total cost (which included labor and supplies) to repackage in-house was around 19 cents per dose. This was a blended cost, meaning it included all the different types of packaging—tablets, vials, capsules, syringes, etc. When we outsourced to our first vendor it cost 15 cents per dose, so we immediately saw savings—the largest amount of which was realized in reduced labor costs. Not only did we save money by redirecting labor, but our pharmacists could now focus on their core competencies—managing drug therapy and working with physicians, nurses, and patients—instead of checking repackaged doses.

Over the years we have actually worked with our vendor to lower that cost, and our current blended cost now is around 10 cents per dose. Looking back on our original baseline cost, we have certainly saved money in the process—some of those savings are in operating expenses with others in capital expenditures. The bottom line was that with our health system outsourcing around 98% of repackaging, we could reduce pharmacy expenses and better focus on patient care.

**Making a Smooth Transition**

**Personnel and Staffing Adjustments**

As with most transitions in the workplace, one of the biggest challenges for us when converting to a different repackaging process was...
managing the change for our employees. Any time there is change (especially one that affects job function), managing it with your staff is going to be a primary focus. You have to work with your staff and make sure they understand why the changes are being made, what the benefits to the organization are, and what the benefits to them may be.

Inventory Levels
Another big concern is making sure there is sufficient inventory for seven to 10 days during the transition phase. Typically about four to six weeks before the conversion, it is a good idea to begin ramping up inventory so there will be enough product on hand to manage the transition.

Equipment Leases and Service Contracts
Be sure to look at your equipment leases to see what contractual obligations you may have, so you can factor this into your timetable. You should determine when you can exit any contracts you may have, so as to avoid paying for equipment that is no longer being used.

Inventory Management
From an inventory management perspective, converting to an outsourced vendor can be challenging. Lead and lag time are a concern and should be managed through good inventory control practices. When we were repackaging in-house, typically we could order a drug and it would come in the next day; we could then repack it and put it on our shelves within 24 to 36 hours. When par levels are based on a known turn-around time, it can be a pretty easy task to manage. Now that we outsource our repackaging, we are sending a product from Richmond, Virginia, to Boston or from Richmond to Ohio, so we have to factor in transit time when setting par levels. Now, when we place an order, the drugs are going to be shipped to a vendor, the vendor is going to take a couple days to package the drugs, and then it is going to take another day to ship back, so inventory par levels have to be managed by the pharmacy buyer with a different turn-around time in mind. What we found is that our typical on-hand inventory would cover seven days when we used the DIY model. When we went to an outsourced model, we needed 14 to 15 days worth of inventory on hand. This is often a big transition for buyers, so it is important to work closely with your buyer on par levels and inventory management. Make sure the buyer understands the lead and lag time and how to place orders to the vendor in order to get them back within a specified time frame.

**Wholesaler Payment Terms**

With an outsourced vendor, you also need to understand your payment terms. Invoices are paid based on terms negotiated with the wholesaler—whether it’s every five days, seven days, 15 days, or 30 days. Generally, the more frequently you pay, the less mark up is added to your purchases. For example, when we place an order with our wholesaler, we will get the inventory and the invoice the next day. This means we can go ahead and immediately process the payment and it will fit into the seven-day term negotiated with our wholesaler. This relatively straightforward process can become more difficult when you involve an outsourced vendor for repackaging. Now, when we place an order, the inventory, along with the invoice, won’t come into the pharmacy until at least four or five days later, so it is now more difficult to manage the payment within the initially agreed upon seven days (see Figure 2). Not meeting the agreed upon date can translate into penalties or a higher cost.
interest rate depending on your contract terms. This can be managed by negotiating different contract terms with your wholesaler, and is an important factor to keep in mind.

We have managed the process by having the repackager confirm with us that they have received the bulk product before we pay the invoice from the wholesaler. Even the best wholesalers have fill rates of 95%, so you want to institute a system that will help ensure you will be receiving exactly what you are paying for, and you want to make sure that it is a system that your finance department will be comfortable with.

Impact on Pharmacy KPI
It is important to be aware of the effects—both positive and negative—that outsourced repackaging can have on key performance indicators (KPI). When we began to outsource in 2005, our drug inventory nearly doubled as a result of the increased lead time, and it doubled again in 2006 when we started outsourcing the vast majority of our repackaging needs. Since inventory is a KPI, few pharmacy directors and hospital finance departments are going to be thrilled about potentially doubling their inventory. The common concern with this situation is that budget dollars tied up in inventory is money that could be in the bank earning interest. Some pharmacies look at inventory as a significant KPI, while others are not as concerned.

At the same time that we doubled the inventory sitting on our shelves, we also reduced one and a half FTEs, meaning we were saving that much in salary per day. Going into this you need to understand that there will potentially be both positive and negative changes to your KPIs, and you need to help your administrative team see the whole picture rather than just the parts. In our case, we could not just look at the fact that our inventory doubled, we also had to factor in our decrease in FTEs. (See Figure 3.)

Conclusion
While outsourcing the repackaging process may not be a solution for everyone, for many hospitals and health systems, it can be a safe, efficient, and effective way to obtain and manage bar coded unit dose medications. For us, it is not only a cost effective solution, but, more important, it frees up our pharmacists to focus on what they were trained to do—positively impact patient care.

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