Pharmacy Inventory Project: Improving Inventory Management at Genesis HealthCare System Pharmacies

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Pharmacy Inventory Project

Improving inventory management at Genesis HealthCare System pharmacies

Spring 2015, Genesis HealthCare System in Zanesville, Ohio, will combine its two not-for-profit hospitals — Genesis-Bethesda and Genesis-Good Samaritan — into one completely renovated facility. At that time the Bethesda site will include a new patient tower with 260 private in-patient rooms, new emergency and surgery departments, critical care unit, medical and radiation oncology centers, and a heart and vascular diagnostic unit.

At the core of the huge capital-improvement project is an objective to gain efficiencies: the two current hospitals sit only about a mile apart. Once competitors — both hospitals date back to the 1890s — the two were merged into Genesis in 1997. One focus for improved efficiencies will be a new pharmacy that, like many other functions affected by the renovation, combines two into one.

Construction and renovation projects usually offer an opportunity to design new processes, improving those that may have been hindered by physical barriers. But with the Genesis pharmacies, problems involved more than just physical space, movement, and flow. Chuck Adams, Director of Lean Six Sigma for Genesis, says he and his team have worked with Genesis pharmacies on many projects, including preparation for the new location. In doing so, they uncovered a contrary set of numbers: medication inventory turn rates had fallen from 14 turns in 2012 to 10 turns in 2013 (approximately a 25 percent inventory increase), while patient volumes had decreased by about 10 percent over that same period.

“When we started looking at inventories associated with both [hospital] pharmacies as well as some other satellite pharmacy operations we have, it became pretty apparent that we were carrying too much inventory and we needed a good methodology to reduce it,” says Adams.

Shane Jenkins, Lean Six Sigma Black Belt, says that as the pharmacies prepared to consolidate, it was important to understand specifics of their medication inventories. Staff would need a reliable count of each item the pharmacies held and where drugs were delivered in order to document that information when inventories were transferred to the new location. As he helped staff conduct its annual physical count of inventory, he saw the opportunity to conduct an improvement project in the pharmacies to help them better manage their medication inventories.

Genesis HealthCare System

- Integrated healthcare system in Zanesville, Ohio
- Two non-for-profit hospitals, both founded in the 1890s
- Network of more than 300 physicians
- Multiple outpatient centers
- New medical center opening Spring 2015 will combine existing hospitals and have 260 private in-patient rooms
With more than $1.6 million of pharmacy inventory on hand, an improvement project also aligned with a hospitalwide focus to make everyone more cost-accountable, says Nancy Sulens, Lean Six Sigma Black Belt. “It seemed like a pretty fantastic area where we can generate savings.” But everyone involved also recognized the challenge: How do you implement an inventory control system for more than 3,000 drugs at five different locations?

**Applying Pareto to Prescriptions**

Four members of the Genesis Lean Six Sigma department attended AEH training in March 2014 at The Ohio State University. Pharmacy staff ideally would have attended as well, says Adams, but scheduling conflicts, such as a wedding, did not make that possible. With substantial training in lean and six sigma, the team’s base of knowledge was a bit different than that of traditional AEH participants. Nonetheless, AEH “provided some unique perspectives on how to use some of the tools we were already familiar with — a little different approach on some of those — and that was helpful,” comments Adams. “And the other thing it did was reinforce what we were trying to do and that we were headed in the right direction. It was nice to have that confirmation from an independent source that we weren’t biased in how we were trying to approach the problem.”

The team took their existing knowledge of the pharmacy operations and some of the new approaches learned at the AEH to pharmacy staff who would work on the improvement project (two pharmacists, the pharmacy manager, the pharmacy buyer, and the pharmacy director). They were open to changes, says Sulens.

One of the first actions the group took was to identify the top medications by quantity and cost among the inventory of 3,000-plus drugs (see *Genesis Pharmacy Inventory*). Pharmacy staff identified 26 drugs that accounted for 50 percent of the inventory spend in 2013. Suddenly a path to improvement became much clearer: “If you can control 26 drugs, that can make a huge impact,” recalls Sulens. The 26 drugs were primarily the highest-cost drugs and those related to scheduled treatments, such as chemotherapy treatment for the cancer clinic, and medications delivered to inpatients.

“The ‘ah-ha’ moment for us was really that breakdown,” says Adams. “We’ve got a formulary of over 3,000 medications, but half of the money we spend can be attributed to only 26 drugs. And so, if we can manage those 26, we’ve got the problem half-solved.” Pharmacy staff believed they could improve the management of 26 drugs, rather than face the staggering
challenge of addressing more than 3,000 drugs all at once.
Knowing where to start their improvement project (26 drugs), they now needed a means to manage them. Keeping the customer (patient) in mind, the improvement team created value-stream maps of their drug-delivery process to Genesis’ IV Infusion Clinic and its Chemo Clinic. The improvement team and pharmacy staff broke the value streams into chunks of medication activities — order, receive, stock, pull, distribute, administer, and return — and identified the interactions that occurred with medication suppliers and healthcare information technologies. The maps surfaced opportunities, such as standardization of buyer work.

The group’s analysis also revealed a lack of information to better manage the medication-inventory process — metrics such as on-hand inventory, lead time, projected turns, and demand. These measures could be used to more accurately determine purchase quantities (what, when, and how much).

The group established a medication inventory goal of 15 turns for 2014, and scoped criteria for the selection of countermeasures that might lead them to achieve that goal: reduce inventories, be implemented at low cost and relatively quickly, minimum need for training, and visually oriented (simple, non-electronic system). The improvement team then explored some common inventory-management methodologies with pharmacy staff, discussing pros and cons of various approaches (see Countermeasures/Recommendations). Some prior attempts to manage inventory that a drug distributor had tried resulted in negative experiences for the pharmacy staff.

The group’s chosen countermeasures incorporated the key information needs:

- **On-hand inventory**: Review the volume of top medications daily instead of annually.
- **Lead time**: Use kanban cards for clarification and transparency of medication-inventory flow.
- **Turn management**: Calculate projected turns for each area to better manage and monitor inventory levels.
- **Demand**: Create a report to provide more visibility for the inpatient delivery process and use the report during seven-day reviews of the outpatient delivery process.

### Countermeasures/Recommendations

<table>
<thead>
<tr>
<th>Cause / Focus Area</th>
<th>Countermeasure</th>
<th>Min. / Max.</th>
<th>Kanban Cards</th>
<th>2 Bin</th>
<th>Tracking Spreadsheet</th>
<th>Automatic Order System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead Time</td>
<td>Propose use of Kanban cards to provide clarification and transparency.</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>On Hand Inventory</td>
<td>Review top medications daily instead of annually.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Turn Management</td>
<td>Calculate projected turns for each area to better manage and monitor inventory levels</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Demand/Forecasting</td>
<td>Create report to provide more visibility for IP, use report in alignment with existing OP 7 day reviews.</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Purchase Qty.</td>
<td>Provides a formula to help calculate quantity required based on key factors.</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
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Source: Genesis HealthCare System
- **Purchase quantity**: Establish a formula based on minimum/maximum (min/max) inventory thresholds to help calculate and keep inventories at optimum levels.

The analysis and development of countermeasures led all to believe that a “kanban system would be a great, easy, cheap, simple way to control when we’re ordering,” says Sulens. Drug ordering previously had been done based on past experiences, which often resulted in different ordering methods by buyers and over-ordering. The group took a more calculated approach, examining past demand and variations in demand, and established:

  - **Minimum** amount of inventory that would trigger an order — the maximum quantity used multiplied by the lead time for the drug (for most items equal to three days on hand).
  - **Maximum** amount of inventory — the highest available quantity necessary to cover unusual events (set at one week supply).

The pharmacy staff had two big concerns coming into the project: One was changing the way they managed inventory. Albeit a loosely managed process, it was still one with which everyone was familiar and comfortable. “The other fear that they had was they are very customer-focused in the sense of wanting to make sure that they’re always able to service our patients,” says Adams. “And so we had to do a little convincing to make sure they understood that part of our goal was no matter what changes we made, that we saw zero impact in the service level to our customers.”

Adams says they overcame concerns with good communications and good data, helped by the relationship that Jenkins had forged with the pharmacies and the pharmacy director. They soon bought into the plan, especially when they saw the financial benefits that could be achieved: “It’s a no brainer. They were chomping at the bit to get new numbers. It was great to see their excitement and involvement.”

Jenkins points out how the data that they had mined on delivery timeframes identified historical reasons that had driven over-ordering. For example, pharmacy staff recalled times when it had taken several weeks to get a product; the actual delays were often less than remembered. “We were able to validate some of that turnaround time and ease their mind about some of those unique orders. And a lot of the drugs they were [concerned] about were national shortages… The data that we were able to collect really helped relieve some of that tension.” The initial mapping exercise also identified that the top 26 drugs *were not* among those medications for which they feared a shortage could occur.

During the planning and implementation phase of the project, the improvement team and pharmacy staff received assistance and an external perspective from AEH faculty member Ken Robinette. Robinette also has coached a member of Adams’ staff who is attending OSU’s Master of Business Operational Excellence program, so Robinette had an informed view of Genesis processes. Adams also notes the ongoing support for the Lean Six Sigma team provided by Genesis top management. CEO and President Matthew Perry “has been a champion for us since day one. He really has provided us free reign to do what needs to be done. I can’t say enough about how helpful that is to have that kind of support at that level. Where we have struggled at times is with middle-level management support. It’s projects like this that help us build those relationships to open doors for us in other places.”

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Managing Medication Inventory

Pharmacy staff began rolling out a four-step kanban system with min/max ordering changes for the 26 drugs in April and May 2014 (see Pharmacy Kanban).

“As we progressed through [the project], we really got all of those folks bought into what we were doing,” says Adams. “They were very excited about getting this project kicked off and to get this underway. They took the ball and ran with it. We were providing support, but they were the ones that were out front doing it, which made it a lot easier. It wasn’t a group coming into the pharmacy and telling the pharmacy how to run. It was pharmacy folks talking to other pharmacy staff: ‘We want to make these changes, here’s why, and this is why it’s going to be good for us.’ We moved into a support role, which is where we want to be.”

Pharmacy staff also took the initiative to explore drug service to other value streams, evaluating drug inventory beyond the top 26 and changing ordering procedures for additional drugs. Some 160 drugs make up 80 percent of the total 3,000-plus, which also is a realistic target to address. “Quite honestly, we didn’t want to push them that hard,” says Adams, “but they took it and ran with it. So that was a great surprise. It signifies that they were serious about really wanting to make a difference.”

Adams says the pharmacies should be able to reach 15 inventory turns per year, even though the initial goal was to get just the top 26 drugs at that level of turns. He believes that the improvement project will have addressed the full 80 percent by next year.

“Rather than go after all 133, they’re now trying to do the next 10 to 15 at a time, analyze the data, put the cards in place, and make sure it’s working and sustainable before they implement it everywhere,” says Sulens. They also are looking at some other drugs that they feel are important to take into consideration, applying the same logic to those medications, even though those are outside of the 80/20 scope of the project. “They’re growing it on their own, and they’re doing a good job of it.”

In addition to improving inventories, notes Adams, pharmacy staff also has been preparing for the consolidation. That one-time event should further enhance their ability to control and reduce inventory. “That’s why we wanted to [change the processes] first, so that we have that out of the way before we move to the new pharmacy,” says Jenkins. “If we move our problems to the new pharmacy, then it’s really
not going help us. We want to try to consolidate and improve inventory control prior to the move so that that’s one thing that’s been completed.”

Results and Next Steps

The improvement team had calculated a potential inventory reduction that equated to between $360,000 and $500,000 in cost savings. In autumn, Genesis pharmacies had realized about $346,000 of that total, and overall inventory turns had risen to 13 turns.

The pharmacy group had previously never seen the negative impact of carrying too much inventory, says Sulens. “That never seemed like a problem. And I think that’s probably similar in many other places. People do not realize the negative impact of too much inventory on-hand. If you don’t have enough and you’re in the healthcare world, it’s obviously a problem. So people tend to hoard and buy too much just to make sure that we’re covered for that extreme case… It was [important to get] them to understand the big picture, why turns are helpful, and to see the impact.”

She says pharmacy staff see the financial benefits and also are experiencing how it makes it easier to run their operations. For example, staff used to walk the shelves twice a day trying to determine what they had to order, and each person did these counts a little differently. “What we did was provide them a standardized methodology for the inventory control and gave them signals to tell them when it was necessary to place orders and when it wasn’t,” adds Adams. “They freed up time to start looking into some of these other issues that they have.”

Sulens notes that it was a “huge relief” for the pharmacy staff to know that they don’t have to count aspirin, which is a tiny fraction of the inventory spend. “You’re wasting your time dealing with that. Focus on the expensive drugs, the big things.”

The 80/20 approach relieved some concerns among staff who feared the problem was too large for them to solve quickly on their own, says Jenkins. He says it also helped that the improvement team presented potential solutions or options with how to deal with the 50 percent and 80 percent. “We didn’t say, ‘This is exactly how you need to do it.’ Throwing out various options and throwing out different ways to do things enabled them to start thinking on their own about how they can solve the problem for the 26 drugs. And that really helped them start to make the change themselves.”
AEH Commentary

With the country focused on controlling the escalating costs of healthcare, every entity in the healthcare system is under increased pressure to lower costs — while at the same time not jeopardizing the quality of care that patients receive. That is a difficult balance to strike, but the Pharmacy Inventory Project clearly shows that both objectives — cost savings and improved service — can be accomplished simultaneously.

In healthcare, as in other industries, inventory is an expensive buffer that often covers up problems. And with problems hidden by inventory, they are difficult to find and solve. Lowering inventory through standardized techniques — kanban system with min/max inventory levels — allows the Genesis pharmacy staff to more readily recognize problems that could occur, freeing them to solve other problems and to prepare for their 2015 move to one pharmacy.

The Pharmacy Inventory Project also illustrates how to take a large and seemingly overly complex problem and break it down into more manageable components. Using the pareto principle offered the Genesis team direction and focus, and gave them confidence that they could begin to improve inventory management.
About AEH

The Academy for Excellence in Healthcare blends in-person class time with hands-on project work, interactive simulations, and recurrent coaching, all aimed at helping healthcare teams spark actionable change at their organization. At the heart of this program is a real-world workplace problem each participant team selects and commits to solving through five intensive days on campus, followed several weeks later by two days of project report-outs and lean leadership training. This project-based approach pays immediate dividends and lays the groundwork for transformational change.

The Academy for Excellence in Healthcare is a collaboration between The Ohio State University Fisher College of Business and Cardinal Health - committed to improving the operations and outcomes of the nation’s health care providers.

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