REPRINT OCTOBER 2010

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Mitch Work

automating the OR supply chain at Memorial Hermann Healthcare System

implementing point-of-use automation for the operating room

CASE STUDY

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Implementing point-of-use automation for the operating room supply chain not only generated additional net revenue, but also yielded operational efficiencies.

AT A GLANCE

- Implementing point-of-use automation for the operating room supply chain involved automating and standardizing supply chain processes.
- Each supply item was identified and assigned a unique code as part of the automated chargemaster catalog.
- The pilot generated additional net revenue and yielded operational efficiencies.

Establishing an efficient and smoothly functioning operating room (OR) is critical to supporting the overall financial health of any healthcare organization. Why? Because the OR and related areas often contribute a significant portion of a hospital's revenue and expenses. A substantial portion of these costs is spent on OR supplies, implants, and medical devices, all of which can be among the most expensive items in a hospital. New models are now emerging that can improve the supply chain spend in the OR, resulting in a positive impact on the hospital's bottom line. These models, driven by strong senior leadership, incorporate recent improvements in automation technology with disciplined standardization policies in managing OR supply inventories. Optimizing processes in the OR and related areas involves intensive planning and time-consuming up-front work, but the payoffs can be well worth the effort.

At the 11-hospital Memorial Hermann Healthcare System serving metropolitan Houston, clinicians, materials management/supply chain managers, financial analysts, and others had been challenged for years by a cumbersome supply inventory system that included different inventory processes in each of its hospitals. Given that clinicians at the health system perform more than 88,000 surgical procedures annually, the lack of standardization and automated processes was no doubt negatively affecting their OR supply chain spend of more than $500 million per year—primarily due to lost charges, loss of productivity and efficiency, and the inability to track and account for supply discrepancies.

View Memorial Hermann's implementation schedule for OR supply chain automation at www.hfma.org/hfm.

That all began to change in 2008 as the result of a pilot project to automate and standardize supply chain processes in the OR. The pilot, and subsequent systemwide rollout, has generated positive outcomes for Memorial Hermann, including improvements in cost and revenue profile, efficiencies in clinical work flow, and materials management/supply chain effectiveness. The new supply chain management process, which includes point-of-use automated supply technology, is on track to deliver a positive ROI within the first year—with OR nurses and clinicians reporting improvements in their time utilization as well. They are now able to accurately document supply use and spend less time managing distractions typical of a nonautomated OR supply chain. Meanwhile, materials managers report a greatly improved operational environment, with more control of supplies and fulfillment processes. In addition, financial executives report satisfaction with the improved charge capture, accountability, and transparency now built into the system.

Two elements have dovetailed, leading to the above-mentioned positive results for Memorial Hermann: combining the strategic application of an automated supply chain management information system with process change that is focused on more conscious utilization and management of OR supplies. In short, leveraging automation and IT to support a change in operational culture has provided improved organizational effectiveness.

Dimensions of the Problem

Supply chain and financial managers at Memorial Hermann had to overcome multiple problems to improve OR supply chain management processes. Although Memorial Hermann's perioperative environment was large and complex with 132 surgical suites and 320 surgeons, the system's OR inventory management and charging system depended on many manual processes and was subject to errors and delays. Furthermore, each of the 11 hospitals followed different inventory management processes. Accuracy issues included lost charges,

A critical success factor in both the pilot and rollout implementation was the re-engineering of core processes before point-of-use automation implementation.

documentation errors, high inventory carrying costs, and stockouts. There were also gaps and redundancies in existing clinical IT systems used in the OR and materials management department. Frequent system down time resulted in costly delays and increased the frustration of perioperative staff. In addition, CFOs were unable to get a full picture of the extent of the problem.

Although the financial impact could not be precisely measured, senior management estimated that losses due to lack of standardization and automation in the OR supply chain management process totaled millions of dollars annually. The situation also had caused an increase in clinician dissatisfaction, because nurses were required to spend time manually documenting supply usage, taking them away from patient care.

The Pilot Project

To address these issues, senior supply chain management and CFOs from the individual hospitals investigated how changing the work-flow process and a standardization of OR supplies, supported by point-of-use automation, could be used throughout the healthcare system. Memorial Hermann was already using automated dispensing machines for medication and supply management on several of the medical/surgical floors, and these systems were generally well accepted by clinical and supply chain staff. After selecting a vendor, the team began discussing in late 2007 how a point-of-use automated supply system would apply to the perioperative supply areas.

It was agreed to launch a pilot project at Memorial Hermann's Texas Medical Center (TMC), the

ABOUT MEMORIAL HERMANN HEALTHCARE SYSTEM

- 11 hospitals serving the greater Houston metropolitan area
- Largest not-for-profit healthcare system in Texas
- Level I trauma center (Texas Medical Center)
- Over 3,500 licensed beds
- $500 million+ annual supply chain spend
- Over 88,000 inpatient surgeries annually
- 132 surgery suites
- 320 surgeons
- 19,000+ employees
- 50-plus clinics and imaging centers

Source: Memorial Hermann Healthcare System, 2010.

healthcare system's 960-bed flagship hospital. A 60-day validation pilot was initiated to understand and measure the impact of adding the point-of-use supply automation to the surgery supply chain at TMC. This pilot involved the installation of 32 secure supply cabinets installed in three key supply areas—endoscopy, mesh, and neurology. The criteria for measuring financial success of the pilot project required demonstrating a positive ROI in which the additional net revenue of the supply charges generated by the new system would be greater than the costs of the new point-of-use automation investment.

Before the "go-live" of the pilot, each supply item was identified and assigned a unique code as part of an automated chargemaster catalog. Each item was also assigned a number generated by the health system's materials management vendor. This effort required a major cleanup process in which 1,798 vendor numbers and corresponding chargemaster codes were created (supply items costing $5.00 or more). To gauge the true impact of the pilot, the "go-live" did not begin until 90 percent of all supply items had a chargemaster code and vendor number assigned.

The pilot project began in September 2008 and was headed by a project team composed of financial representatives from TMC, supply chain managers, financial analysts, OR supply staff, clinicians, and representatives from the selected vendor. Once the 60-day pilot was completed, monthly average charges from each of the pilot units were compiled and compared with their average monthly charges reported over the 12-month period before initiating the pilot. The findings disclosed:

- The pilot ROI exceeded the goal of generating additional net revenue above the total cost of the investment in the point-of-use supply technology. There was a $2.3 million charge increase from the pilot units and a $1.4 million net revenue improvement.
- TMC identified 136 items that had not been assigned a chargemaster code; once assigned, charges increased $1,578 per day (or $410,280 annually based on a five-day workweek).
- A total of $96,000 in excess inventory was identified in the three pilot areas.

Project Rollout

Pilot results were shared with the system's CFO Council, composed of the corporate CFO and CFOs from each of the 11 hospitals. Each hospital CFO was responsible for committing funds from his or her hospital for any new projects. Based on the ROI metrics reported by TMC, all hospitals opted over the next year to implement the program in their facilities. For each facility, the implementation methodology was the same: supply chain/materials management managers initiated a comprehensive inventory process, identified each supply item costing over $5.00, and assigned each item a chargemaster code and vendor number to standardize the inventory system across the enterprise. To date, more than 4,000 vendor numbers and corresponding chargemaster codes have been created.

Training on the New System

Although the actual instruction of an OR clinician in the use of the system takes relatively little time (usually less than 30 minutes), considerable planning was undertaken by supply chain management to communicate to OR nurses and staff why the changes were being made—and how the system would simplify their work flow, improve cost capture for the hospital, and increase regulatory compliance. Initial training on the secure supply cabinets was conducted by the vendor and consisted of hands-on instruction and online training modules to accommodate staff schedules. Super users were then identified for each supply area and were assigned responsibility for training new users and updating current users on new releases, changes in processes, and new supply items with assigned chargemaster codes.

Implementation

Aside from the new point-of-use supply automation (both open and secure cabinets were installed), the only additional hardware investment was the purchase of an additional central server to better handle and route the increase in data reported from the 11 facilities.

As in the pilot study, each hospital had to demonstrate that 90 percent of its supply items were assigned chargemaster codes before "going live," thus enforcing up-front the requirement to standardize.

The rollout implementation at the 11 facilities began in October 2008 and was completed in September 2009. The implementation process was led by three multidisciplinary implementation teams composed of supply chain representatives, clinicians, CFO representatives for each hospital, and an implementation consultant from the vendor. Each facility implementation was completed in two to nine months, depending on the size of the facility and the number of point-of-use supply cabinets to be installed. Also, because of the size and complexity of the Memorial Hermann facilities, the health system continues to use 21 separate item masters across the organization to avert traffic pressure on the information systems that could cause a shutdown. Consolidation of those item masters is now being considered.

Re-engineering Core Processes

A critical success factor in both the pilot and rollout implementation was the re-engineering of core processes before point-of-use automation implementation. Although automation served as an important enabler of this process, the many work-flow process changes and the emphasis on standardization helped bring about positive change at Memorial Hermann. For example, it was determined that for supply items to be reliably restocked and available for surgeries scheduled for the next day, some supply chain technicians would have to start their shift earlier in the morning—a big change for these employees, but one that resulted in a much smoother, more reliable, and efficient perioperative process.

Furthermore, the decision to assign all OR supplies costing $5.00 or more with a chargemaster code is another example of how work-flow processes were changed. Although this change required a large up-front effort, the resulting efficiencies began to show financial benefits and proved to be a valuable enabler early on.

Rollout Results

Based on the initial results following the implementation of the new process and automated supply chain management solution, Memorial Hermann is on track to achieve the following results:

- Approximately $67 million will be generated in 2010 from additional charge capture, assuming no change in supply volume over 2009.
- By the end of 2010, Memorial Hermann expects to have realized $13 million in net revenue increases from having automated and optimized the supply chain management system. This includes the cost of the point-of-use OR supply automation and results primarily from improved charge capture and inventory control.
- One particularly significant metric has been an increase in gross revenues per 100 surgical minutes (100 minutes representing the average length of a surgical case within the organization). That figure has risen from around $11,000 in 2007 to $15,000 currently, or an additional $4,000 per surgical case—a 36 percent increase.
- Compliance with supply utilization processes has reached 95 percent in the participating facilities.
- Overall, a major shift toward standardization of processes has taken place. All new supply items will have a vendor number and chargemaster code, enabling maximization of charges and inventory controls going forward.
- Clinician satisfaction with the system has been positive and sustained, especially among OR nurses, who no longer are required to reorder OR supplies and can spend more time on patient care.
- Supply chain management/materials management staff satisfaction with the system, and with their overall job satisfaction, has improved due to the standardization of supplies and inventory controls.

These improvements are occurring when cost pressures at Memorial Hermann are mounting due to current economic conditions and rising supply costs. For example, a decade ago supply costs were $200 million, compared with $560 million today.

All of these metrics speak to the profound changes that have taken place in a relatively short timeframe since Memorial Hermann introduced new processes and the new supply chain management system. Of course, beyond the financial statistics lies a fundamental change in culture. Memorial Hermann has progressed from a manual, often paper-based system to one of collaborative systems thinking and consciously designed processes—including a drive toward enterprise standardization.

Memorial Hermann Financial Executive Perspectives on Change

For those in financial executive management at Memorial Hermann, the results are encouraging. "The supply chain professionals, executives here on campus, *really everyone* was pleased that we were able to get our inventory down and move toward a just-in-time process—reducing OR supply expenses, while better capturing OR charges," says Mary Oetken, chief of financial reporting and budgeting at Memorial Hermann TMC. "One key success factor in our rollout at TMC was that our implementation team had a highly effective champion—an OR nurse executive who was knowledgeable about the financial aspects of OR supply automation and could enthusiastically communicate with other clinicians about the importance of this initiative."

Looking back at the pre-initiative environment, Oetken says, "You had a situation in which you had all these supplies, and if there weren't chargemasters associated with each item, you knew you weren't capturing all appropriate charges correctly." That deficit was a systemic problem from the financial management perspective. Now, Oetken says, "There's nothing better than knowing that charges are more accurate and you are getting paid for all the good work you're doing."

Future Directions

Looking forward, supply chain managers at Memorial Hermann will continue to refine and update the new system. They are also considering expansion to other areas, including stents used in the catheter lab, trauma plating and screw systems, and implants. Another project aimed at improved standardization in the OR is an integration between their OR information system and OR supply automation, which will enable OR data to flow seamlessly into the health system's electronic medical record.

Fundamental to all of these elements is the strategic systematization of supply processes in the OR. Memorial Hermann's recent experiences point to a future path of optimization and greater efficiency in this critical area of hospital operations. ●

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