

The Rewards of Hospital-Wide Automation



Children's Medical Center of Dallas

Location: Dallas, Texas

Beds: 322

Community Population: 3,366,618

This article examines how one large pediatric hospital, Children's Medical Center of Dallas, has used automation systems to manage inventory, track and reduce costs, recapture lost charges, reduce medication errors, improve efficiency, and enhance patient care.

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An ongoing challenge for all healthcare institutions is providing increasingly sophisticated, high-quality patient care in an era of spiraling costs, ever-tighter budgets, and reduced reimbursement. Such an environment forces institutions to constantly look for ways to reduce costs and yet still provide quality care. However, while focusing on ways to cut costs, many institutions fail to recognize the importance of maximizing the dollars already available to them. In the past several years, a variety of computerized clinical infrastructure and workflow automation systems have been introduced to help healthcare facilities recognize revenues otherwise lost to internal inefficiencies.

Identifying System Inefficiencies

Children's Medical Center of Dallas is a 322-bed, private, not-for-profit institution with a state-of-the-art pediatric emergency center, off-site outpatient pediatric clinics, and specialized pediatric intensive care units (46 beds total), including an 11-bed Cardiac Intensive Care Unit (CICU). Like most medical institutions, Children's is constantly looking for ways to wring out inefficiencies to improve its performance both clinically and financially.

One area in which it became increasingly clear that Children's needed assistance in meeting its financial objectives was in billable patient supplies.

“The losses could be traced to the hospital's outdated inventory management and distribution system and its cumbersome, labor-intensive billing system,” said Lynda Maskrey, director of materials management.

Historically, Children's relied on hand-held computers to key in hand-counted inventory.

“This process was slow, tedious, and often inaccurate, mostly because the system couldn't keep up with the hospital's dynamic inventory flows. Thus, stock-outs, overstocks, and outdated materials—and their associated costs—were a constant problem,” said Maskrey.

Compounding the hospital's inventory control problem was its outdated distribution and billing system. This system

required the distribution department to place product tracking stickers on everything stocked that was billable. Once an item was used for patient care, a staff member would remove the item's sticker and place it on a patient encounter card. Later, the items listed on the encounter card would be manually entered into the hospital's computer-based billing system.

Needless to say, such a system was costly and tremendously inefficient. Furthermore, the stickers often ended up stuck to everything but an encounter card, resulting in a number of items never being properly accounted for or billed for by the hospital.

Exploring Automation as a Solution

Determined to improve and better coordinate the hospital's inventory, distribution, and billing systems, Maskrey began researching new methods in supply management. After attending several trade shows, she came away impressed by the advances that had been made in automated supply management systems and was convinced that they had much to offer the hospital.

After further researching the features and benefits of various vendors' products, Maskrey, along with a newly formed automation steering committee, chose the Omnicell™ System, primarily because it was more user-friendly and offered features, such as keypad entry and badge-swipe user identification, that were not found in other systems at that time.

While the benefits of an automated hospital inventory management system were clear to the steering committee, the advantages were not immediately clear to the medical center's staff and administration. The Children's administration requested a complete cost/benefit analysis prior to implementing an automation system.



Lynda Maskrey
Director of Materials Management
Children's Medical Center of Dallas

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Recognizing that installing such a system would eventually affect all the departments within Children’s, Maskrey assembled a multidisciplinary team consisting of representatives from materials management, nursing, pharmacy, intensive care, and facilities management to complete the cost/benefit analysis. After meeting weekly over a period of six months, the team concluded that automation could potentially increase revenues by:

- Improving inventory control and its associated costs
- Providing a more structured and accurate ordering process
- Improving record-keeping for product usage
- Improving billing accuracy to capture lost charges
- Reducing the time the medical staff spent on paperwork and other nonclinical tasks

“Based on these findings, our administration agreed to proceed,” said Maskrey. “But they requested a phased-in approach to automation so that any problems that arose could be addressed early on and that the costs associated with its implementation could be readily monitored.”

Implementation Begins in the Emergency Department

Among the hospital’s numerous clinical areas, the emergency department (ED) was chosen for the first phase of the automation program.

“The ED’s high-cost, high-volume, high-turnaround environment provided the perfect setting for testing such a system,” said Maskrey.

At first, OmniXpress™ units were placed in each ED treatment room. Soon afterward, however, it was recognized that these units were too small and were replaced with much larger, combination (pharmacy and supply) One-Cell OmniSupplier® cabinets. Meanwhile, the two ED trauma rooms were outfitted with multiple combination OmniSupplier cabinets to accommodate the additional supplies needed in these rooms.

Once the cabinets were in place, the staff was trained to use the Omnicell System. “Training is key to a successful implementation,” noted Maskrey. “Omnicell provided an on-site representative to train the ED staff and develop Omnicell ‘superusers’—staff with additional training who would later train other staff members.”

In September 1997, the Omnicell System went live in the ED.

Initially, the nursing staff was wary of the automated supply cabinets. “The nursing staff was concerned about system security, running out of stock, and the time it would take to learn to use the system effectively,” said Maskrey. “However, after completing training and experiencing the Omnicell System first-hand, the nurses were pleasantly surprised.”

They found that the system was indeed secure, improved workflow, and significantly reduced the time and paperwork associated with tracking product usage. They also found the Omnicell System made it much easier to control outdated supplies.

Early Financial Impact

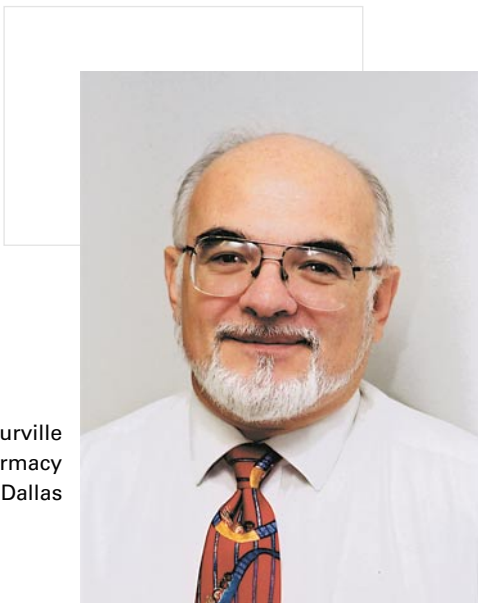
After a six-month trial period, the return on investment of the ED’s Omnicell automation system was evaluated, and the results were remarkable.

“Even after only six months, the ED had already realized a 20 percent increase in its capture of otherwise lost charges. These encouraging results led the Children’s automation team to recommend that the automation program be expanded,” Maskrey said.

Pharmacy Goes “Live” with Automation

The Children’s pharmacy has experienced tremendous growth over the past few years, and currently processes more than 1.2 million doses annually.

“Our ability to effectively deal with this growth has, in large part, been due to the various automation systems the pharmacy has installed since 1997” said John Tourville, PharmD, director of pharmacy.



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As part of the pre-automation justification process, Tourville identified three key areas where automation could have an early, significant impact on the pharmacy's performance:

Ordering and dispensing process

The drug ordering and dispensing process at Children's needed streamlining because of some delays in administering drugs to patients and high unit-dose drug costs. For example, during one process analysis, a single drug dose was found to track through 36 different people in the hospital.

Deployment of pharmacists

Another issue confronting the pharmacy was the diminishing clinical interaction of its pharmacists with the nursing and medical staff. Such interaction is key to monitoring a hospital's drug prescribing habits and helping to avoid potential medication dispensing and administration errors. Again, this problem could be readily attributed to inefficiencies within the pharmacy, which kept pharmacists off the wards and in the pharmacy dealing with paperwork.

Medication errors

When compared to its peers, the hospital's performance was average in all benchmarking activities, including the pharmacy error rate, which is often considered to be the pulse of a pharmacy's effectiveness. Such performance demanded improvement.

“Children's chose to incorporate a variety of different automation systems to address these issues,” Tourville said.

In addition to Omnicell units, Children's installed the McKesson Automated Health Care ROBOT-Rx system to improve the speed and accuracy at which unit-dose orders were filled and dispensed. It also incorporated McKesson's AcuScan-Rx hand-held devices into the drug administration process. These portable point-of-care devices, which are used by the nursing staff, help reduce medication misadventures by ensuring that the correct drug and dose are given to the right patient at the right time and by the right route. Finally, to permit secure dispensing of stats and narcotics at the point of care, Omnicell Pharmacy Modules were installed into the OmniSupplier cabinets located throughout the patient care areas of the hospital.

Together, these automation systems significantly improved the performance of the Children's pharmacy. Use of the ROBOT-Rx system and

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Omniceil units not only decreased the turnaround time for stat drugs and the lag time for routine medications, but also improved narcotic control and decreased the incidence of “missing” medications.

“In addition,” Tourville noted, “these automated systems helped significantly reduce the cost per unit-dose from 97 cents per dose (1997) to 70 cents per dose (1999). Most of these savings could be directly attributed to reduced pharmacy labor costs as a result of automation.”

The ROBOT-Rx and Omnicell systems, along with the AcuScan-Rx devices, also dramatically reduced medication dispensing and administration errors. Children’s now boasts the lowest medication error rate among 15 peer hospitals.

Tourville also cited other benefits of pharmacy automation.

“Most notably, it has allowed the hospital’s pharmacists to become more decentralized. No longer bogged down with excessive paperwork, Children’s pharmacists can now be up on the floor attending clinical rounds with physicians and interacting with the nursing staff,” Tourville said. “This increased clinical activity has also helped reduce medication misadventures, since the pharmacists can now better monitor drug orders for potential dosing errors and drug interactions.”

Pharmacy automation at Children’s continues to evolve. Currently, the pharmacy is working with Omnicell to integrate Omnicell’s comprehensive data analysis system, DecisionCenter™, with its current automation systems and other vendor products to optimize inventory management, improve regulatory compliance, and spot trends in drug utilization and diversion. It is also working on adding a direct physician order entry system and automating its I.V. and oral liquid syringe program to further improve drug-dispensing efficiencies.

The ICU Automation Experience

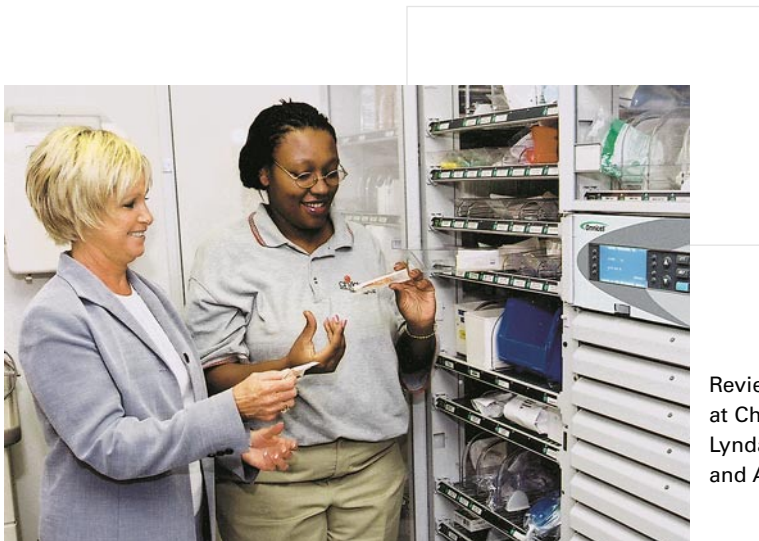
The ongoing success of the Children’s automation program prompted it to expand the program into the hospital’s intensive care units in May 1998. Like the ED, the ICUs provided another important proving ground for automation because they, too, are high-cost, supply-intensive environments.

The transition to a fully automated supply management system was remarkably easy in the ICUs, primarily because the ICU director, Dorothy Foglia, was an early champion of automation, and she had thoroughly prepared her staff for the transition. Since the installation of the Omnicell System, the hospital's ICUs have realized a 30 percent increase in lost charge recapture. Today, the ICUs capture nearly 100 percent of all billable charges.

Hospital-Wide Automation Becomes a Reality

After the experiences in the ED, pharmacy, and ICUs, it was becoming increasingly clear that automation was meeting or exceeding the expectations set by the Children's automation team and the hospital's administration. This led to the decision to begin implementing hospital-wide automation with the Omnicell System in June 1999.

Today, 167 Omnicell units and four OmniCenter® workstations are installed throughout the hospital. By using automation, Children's has been able to pare down its inventory on hand from 12 days to five and now captures 92 percent of all billable supplies. "We're thrilled by the positive impact automation has had both clinically and financially," Maskrey said. "It's been a wonderful thing...not only for materials management, but also for nursing and for patient care."



Reviewing dispensing steps of the OmniSupplier at Children's Medical Center of Dallas are (left) Lynda Maskrey, Director of Materials Management, and Anjanette Conaway, Omnicell Technician.



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