

ORGANIZATIONAL PROFILE



The Medical Center

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Bowling Green, KY 42102
(270) 745-1000
www.mcbg.org

Industry: Healthcare
Employees: 2,500

PROJECT HIGHLIGHTS

- Gained a net economic benefit of \$691,000.
- Realized a payback period of 1.8 years.
- Established a bar-code foundation for patient safety and productivity initiatives.
- Experienced a 200% increase in time for pharmacist clinical activities, resulting in \$112,000 annual savings through reduced ADEs.
- Eliminated bar-code packaging labor, enabling redeployment of 0.4 pharmacist and 1.4 technician FTEs.
- Reduced pharmacy technician picking labor by 33%.

The Medical Center at Bowling Green Re-Engineers its Pharmacy with Automation Technologies, Re-Energizes Patient Safety

Background

The Medical Center is a not-for-profit facility, based in Bowling Green, KY, and is the largest employer in Warren County, with more than 2,500 employees. With campuses in Bowling Green, Scottsville and Franklin, The Medical Center has 402 acute care beds and 110 extended care beds. More than 225 physicians provide healthcare in specialties that include cardiac care, maternity, cancer treatment, and emergency care. The Heart Institute at The Medical Center offers the region's only comprehensive cardiac program, including the area's only 24-hour emergency intervention for open-heart surgery.

The Medical Center at Bowling Green has earned numerous accreditations and awards, establishing it as a premier regional healthcare institution. The Medical Center has the only cancer program in the area accredited by the Commission on Cancer of the American College of Surgeons, and is one of only three in the state to earn nuclear medicine services accreditation by the American College of Radiology. The Society for Chest Pain Centers granted the designation of Accredited Chest Pain Center to The Medical Center, making it the 40th in the nation to be accredited. And, The Medical Center's Emergency Medical Services is accredited by The Commission on Accreditation of Ambulance Services. It is the first private, not-for-profit service in Kentucky and just one of 100 nationwide to achieve this status.

The Challenge

The pharmacy department of The Medical Center at Bowling Green determined that its dependency on manual tasking was inhibiting medication safety, workforce productivity, and financial performance. Pharmacists spent significant time on repetitious order entry, and dispensing, checking, and distributing medications for multiple hospital sites. There was little time available for clinical activities. Similarly, the nursing units also followed manual medication dispensing processes. The pharmacy department believed its manual-based processes were contributing to potential medication errors due to misfills, as well as medication stock-outs at remote sites, and difficulty in controlling the decentralized medication inventory and in tracking expired medications.

In late 2005, The Medical Center launched a Pharmacy Re-Engineering Project based on bar-code technology. The new process features the McKesson ROBOT-Rx® system and MedCarousel® technology for the central pharmacy. These technologies automate the storage, dispensing, returning, restocking, and inventory control of bar-coded medications. The PakPlus-Rx® system ensures that a continuous supply of bar-coded medications is available. With these new processes in place, pharmacy leaders believed they could significantly impact productivity, workflow efficiency, reduce the potential for medication errors, and reduce medication inventory costs.

The Results: Quantifiable Benefit Proof Points

The Pharmacy Re-Engineering Project will have an immediate, lasting impact for The Medical Center in terms of workforce productivity, patient safety, and financial performance.

1. Workforce Productivity. The efficiency in ROBOT-Rx and MedCarousel medication distribution enables significant pharmacist time to be shifted from distribution and order entry to patient care activities. Benefits include: increased patient safety, improved drug cost efficiency, and an elevated status for pharmacists within the patient care team, enriching the pharmacist's job.

"The Pharmacy Re-Engineering Project at The Medical Center is using information technology to improve patient care, provide job enrichment to our pharmacists and increase productivity. McKesson Automation products contribute to these objectives by automating tasks that enables pharmacists to spend more time with patients and physicians. This makes the pharmacist's job much more exciting and rewarding in addition to providing more effective and efficient patient care. This project puts the foundation in place for an automated, closed-loop administration of medications to keep our hospitals on the leading edge of patient safety."

Jean Cherry, Executive Vice President, Commonwealth Health Corporation

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"The McKesson Automation solutions with their inherent productivity bring a new dimension to hospital pharmacists. There will be opportunity for professional development, and the ability to make use of all of the pharmacy staff's clinical skills. It is the difference between working full time in the main pharmacy with no contact with patients, to spending time with patients as part of the overall healthcare team. This is our vision."

Melinda Joyce, Pharm.D., FAPhA, FACHE, Director of Pharmacy, The Medical Center

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"The pharmacy and finance departments have worked together closely on this project. The initial driving force was to achieve state-of-the-art performance in preventing medication errors, which improves overall patient safety. As we evaluated the project, we realized re-engineering the pharmacy workflows would yield significant pharmacy operations efficiencies and productivity as well."

Larry Vaughn, C.P.A., Vice President-Corporate Finance, Commonwealth Health Corporation

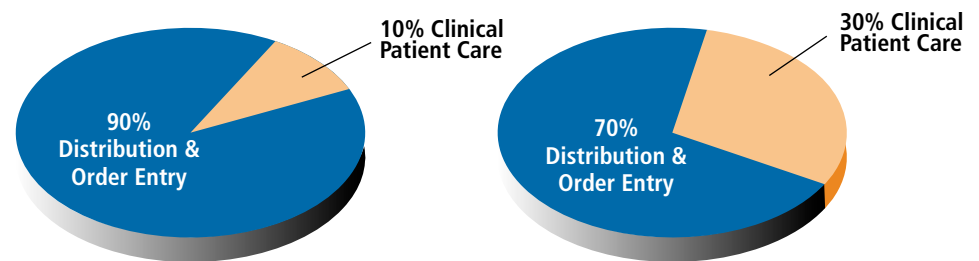
Before:	90% Distribution & Order Entry	10% Clinical Patient Care
After:	70% Distribution & Order Entry	30% Clinical Patient Care

Additionally, because the pharmacy dispenses medications via patient-specific envelopes, time is saved on the nursing floor. Nurses do not have to go into the unit-based cabinets for each dose. This will result in time efficiencies as well as reduced medication errors.

Additionally, the PakPlus-Rx operation will eliminate the need to manually prepare unit-dose medications, which allows redeployment of 1.4 FTE technicians and 0.4 pharmacists—a **100 percent reduction for this task**. Through process re-engineering, ROBOT-Rx and MedCarousel now account for up to 90 percent of all medications dispensed. Fully automated picking will enable The Medical Center to reduce technician picking labor by 1 FTE—a **33 percent improvement**.

Increased Pharmacist Clinical Intervention

ROBOT-Rx and MedCarousel efficiency in medication distribution enables significant pharmacist time to be shifted from distribution and order entry to patient care working with physicians.



- Increases patient safety
- Improves drug cost efficiency
- Contributes to pharmacist job enrichment
- Elevates the pharmacist within the patient care team

2. Medication Safety. Freed from time-consuming, manual tasking, pharmacists can be redeployed to clinical patient activities. The Medical Center will redeploy 1.5 pharmacist FTEs from distribution to clinical activities—a **200 percent increase**. This results in more effective and less costly patient care, resulting in projected **savings of over \$200,000 annually**.

With increased pharmacist time available for patient care, adverse drug reaction events (ADEs) are conservatively estimated to be reduced by 10 percent—**savings valued at \$112,000 per year**.

Furthermore, the Pharmacy Re-Engineering Project enables the desired future state of going to a 100 percent, fully bar-coded system for bedside medication. Without this project, gaining this capability would have required additional expenditures.

3. Medication Inventory and Cost Performance. The inventory efficiencies realized from the Pharmacy Re-Engineering Project accrue from moving to a patient-specific medication distribution model. This process lowers inventory and improves reliability that patient medications will be available when needed. This results in lower costs and better patient care.

- ROBOT-Rx enables a centralized-hybrid medication distribution system vs. decentralized medication inventories, resulting in a medication **inventory reduction of 20 percent, valued at \$121,000 per year**.
- ROBOT-Rx enables continuous rotation of product based on expiration dates, resulting in a **90 percent reduction expired medications, valued at \$13,500 annually**.

"The pharmacy re-engineering project will have significant benefits for those facilities located away from the central pharmacy. Currently, we do not have a pharmacist at our facility two days a week. With the pharmacist productivity achieved through automating operations, we should see increased pharmacist clinical work at our facility.

Also, with ROBOT-Rx enabling medications to be delivered for our individual patients from the pharmacy, we will free up space in our cabinets for other medications, which will reduce the number of expedites needed. This improves patient care and nursing satisfaction as well as reducing costs."

Wade Stone, Vice President, Administrator, The Medical Center at Scottsville



"We have a system in place where every pharmacist has an area of specialty to collaborate with physicians and nurses to optimize patient care. This additional clinical intervention will improve patient care, lower costs, foster teamwork and provide job enrichment. The biggest challenge until now has been finding the time to participate."

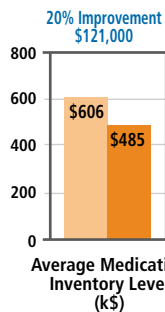
Glee Lenoir, Pharm.D., Pharmacy Clinical Coordinator, The Medical Center



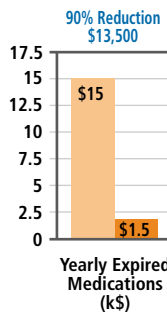
"The central role of bar-coded medications in the Pharmacy Re-Engineering Project will give us the foundation for making 'Five Rights' point-of-care medication administration a reality. Nurses are very appreciative of anything that helps them perform their jobs in a more effective and efficient manner."

Betsy Kullman, RN, MSN, Chief Nursing Officer, The Medical Center

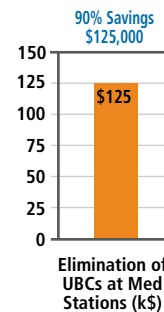
Medication Inventory Efficiencies



ROBOT-Rx enables a centralized hybrid distribution system vs. decentralized inventories at every medication station, which enables inventory reductions of 20%, essentially JIT inventory.



ROBOT-Rx enables continuous rotation of medications based on expiration dates, which results in a 90% reduction of write-offs for expired medications.



By converting from a decentralized to hybrid distribution model, overall unit-based cabinets are reduced with the JIT inventory model.

Pre McKesson Post McKesson

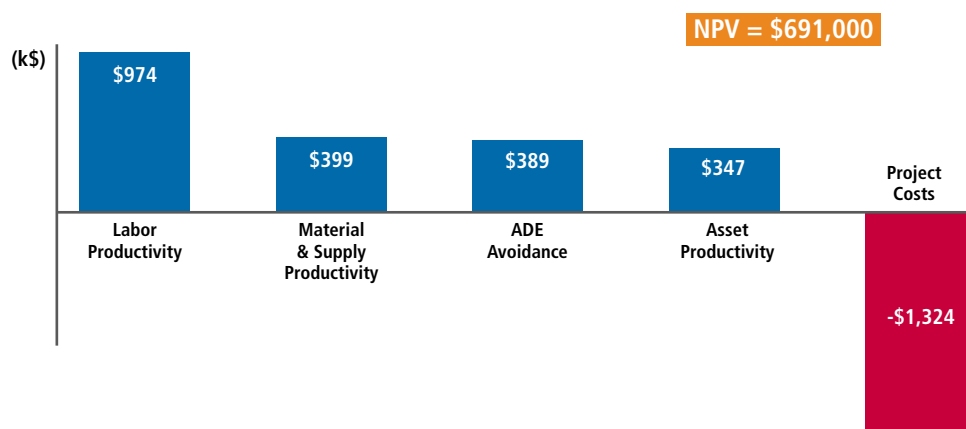
- By converting from a decentralized to hybrid distribution model, the overall number of unit-based cabinets is reduced, resulting in **savings valued at \$125,000 per year.**
- With PakPlus-Rx, medications can be purchased in bulk vs. unit-dose tablets. This results in **a 30 percent savings on the impacted medications, saving \$39,000 annually.**

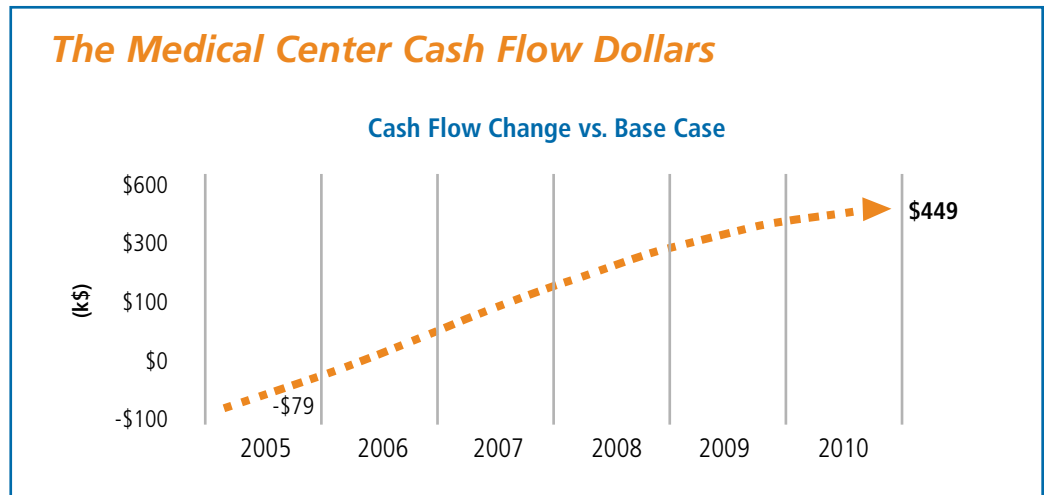
4. Financial Performance. This evaluation demonstrates that the implementation of McKesson Automation Solutions at The Medical Center at Bowling Green will provide significant quantifiable benefits as well as non-quantifiable benefits. The Pharmacy Re-Engineering Project was implemented during 2005. Benefits are assumed for five years with no terminal value. This is a conservative assumption, as projects of this magnitude, with this degree of cutting-edge technology, will normally be used for seven years or more.

The Net Present Value represents the net economic benefit that will be realized by The Medical Center. It takes into account project costs and benefits, and discounts the cash flows from this project by the time value of money. **The Medical Center will be \$691,000 better off through the quantifiable benefits of this project.**

The project has an estimated return on investment of 59 percent. Considering the cost of capital for a community medical center ranges between 6-10 percent, the results of this project are outstanding. The payback period of 1.8 years is excellent. A fast payback period demonstrates less risk from a project, since "cash flow break-even" occurs relatively quickly.

Net Present Value





Summary

This independent evaluation demonstrates that The Medical Center's implementation of McKesson's automation solutions will provide significant quantifiable benefits as well as strategic benefits.

- The Medical Center will realize a net economic benefit of \$691,000 from this project, taking into account project costs and benefits. This is based on specific, achievable operating metrics that will be monitored closely.
- The return on investment for the life of the five-year project is projected to be 59 percent.
- The payback period of 1.8 years is excellent.
- Non-quantitative benefits also exist:
 - establishing the foundation for automated, bar-code-based bedside administration of medications
 - job enrichment for pharmacists
 - reduced financial risk from a major medication error

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