

ORGANIZATIONAL PROFILE



Appalachian Regional Healthcare

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859-226-2440
www.arh.org

Industry: Healthcare
Employees: 4,400

PROJECT HIGHLIGHTS

- Forecast a 33% ROI over 5 years, with a project net present value of nearly \$1.5 million.
- Established a bar-code foundation for patient safety and productivity initiatives.
- Increased by 8% pharmacist time for clinical activities, resulting in \$197,000 in annual savings through reduced ADEs.
- Reduced pharmacy technician picking labor by 83%.
- Cut pharmacist checking labor by 75%.
- Slashed the number of missing medications by 95%.

Rural, Nine-Hospital System Sees Huge Gains in Medication Safety, Productivity and Cost Savings with a Single-source, Single-interface Solution

Background

From its founding, the hospitals that made up the United Mine Workers of America's Miners Memorial Hospital Association were a striking innovation and introduced new services to the Central Appalachian coalfields in the mid-1950s. The system soon became a model for similar healthcare organizations across the country.

Today, that health system is known as Appalachian Regional Healthcare (ARH), and encompasses nine hospitals with 1,065 licensed beds, 4,400 employees and approximately 620 medical staff members, both active and courtesy physicians.

The Challenge

In 2003, ARH's drug dispensing processes were labor-intensive, disjointed, and non-congruent across the nine-hospital system. This was opening the door to potential medication errors, and the inefficiencies were costing ARH money.

In several hospitals, nurses dispensed medications from unit-based medication cabinets. Other hospitals had cabinets in the emergency room only. One hospital had no cabinets at all. By operational necessity, there were very different processes in place in each hospital.

Consequently, hospital leaders developed a vision for a new pharmacy supply chain. In 2005, ARH partnered with McKesson to implement this vision. There were three main goals:

- Improve medication safety procedures, thereby contributing to improved patient safety
- Improve productivity by reducing manual tasking for pharmacists and technicians
- Reduce waste and improve financial performance by automating medication ordering, inventory control, and distribution

The Results: Quantifiable Benefits

ARH recreated its entire medication supply chain. It automated processes from the time drugs are ordered from the wholesaler, through storage and dispensing, to inventory control and re-ordering. This foundation also enabled efficient support to nursing, and positioned ARH for future electronic bar-code medication administration. This model was standardized across all nine hospitals, and includes the following technologies:

- The Connect-Rx® software platform serves as a single integration point for all technologies and maximizes data exchange.
- The PACMED™ high-speed packager packages oral solid doses in bar-coded, unit-dose form.
- The MedCarousel® system is used for daily cart fill, first doses, and cabinet filling. The pick-to-light and bar coding technology reduces the chances of errors and empowers staff. Pharmacists now are a greater part of the medical team, working with physicians and nurses on the patient floors to improve outcomes.

"Having a single-vendor, single-interface solution was crucial to success. This approach simplified implementation across the system, made for more efficient issue resolution, and the integrated automation and replenishment process saves us time. It also was important to us that McKesson felt a vested interest in our overall success."

Jeffrey Akers, Pharm.D., MHA, BCPS
ARH System Director of Pharmacy

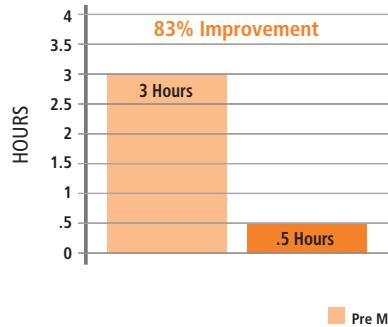


"The pharmacists' roles have changed significantly as a result of the pharmacy automation project. Since we spend less time on routine tasks, we can spend more time with patients as part of the medical team. I'm excited about more active participation in patient care. For example, now that the cart fill can be completed so much more quickly, I get to the floor earlier to meet and discuss clinical interventions with doctors while they still are on their rounds."

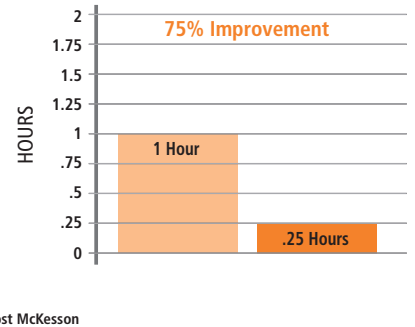
Tom Parr, Pharm.D.
Clinical Pharmacy Coordinator
Whitesburg ARH Hospital

Pharmacy Productivity

Technician Time Spent on Cart Fill



Pharmacist Time Spent Checking Medications



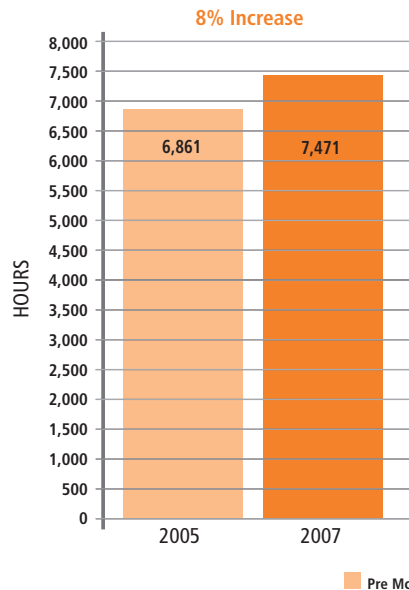
- AcuDose-Rx cabinets are used for all narcotic dispensing and most first dose and PRN medications. Using profile-dispense mode ensures that ARH complies with the Joint Commission requirement for pharmacist verification of all medication orders prior to administration.
- NarcStation™ vault units and software system provides a self-contained, closed-loop system for controlled substances.
- Fulfill-Rxsm software uses advanced algorithms to create real-time inventory visibility into all medication storage locations, and also automates re-ordering at optimal prices from the McKesson distribution center.

The phased technology rollout paid fast dividends. In terms of medication safety and pharmacy productivity:

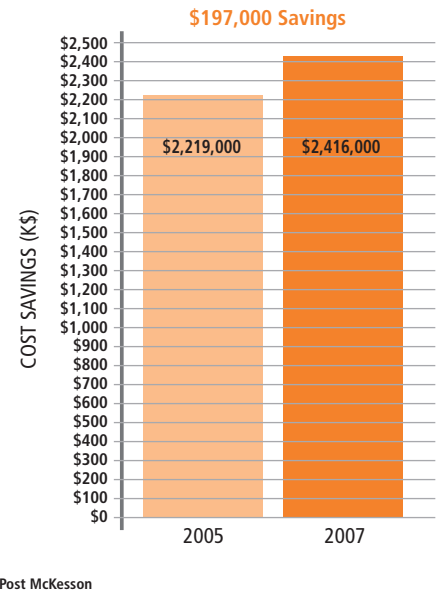
- Technician picking labor for the daily cart fill was reduced by 83 percent.

Medication Safety

Clinical Interventions



Clinical Intervention Cost Savings



"Under our manual medication distribution system, by necessity the inventory process was 'take one, order one'. A systematic approach to setting maximum levels and re-order points by medication was not possible with the information available.

With our new, integrated systems approach, ARH has real-time data on usage rates and inventory levels. When combined with Fulfill-Rx algorithms, this enables us to set levels resulting in lower inventories while also improving medication availability for patients."

Tim Steffen, Pharm.D.
 Director of Pharmacy
 Whitesburg ARH Hospital



"The financial key to this project was the fact that the products integrate with one another. We now have an integrated medication supply chain in which medication usage and inventories are known in real time. We are optimizing inventories from a cost standpoint, while improving the timely availability of medications for patient care and safety."

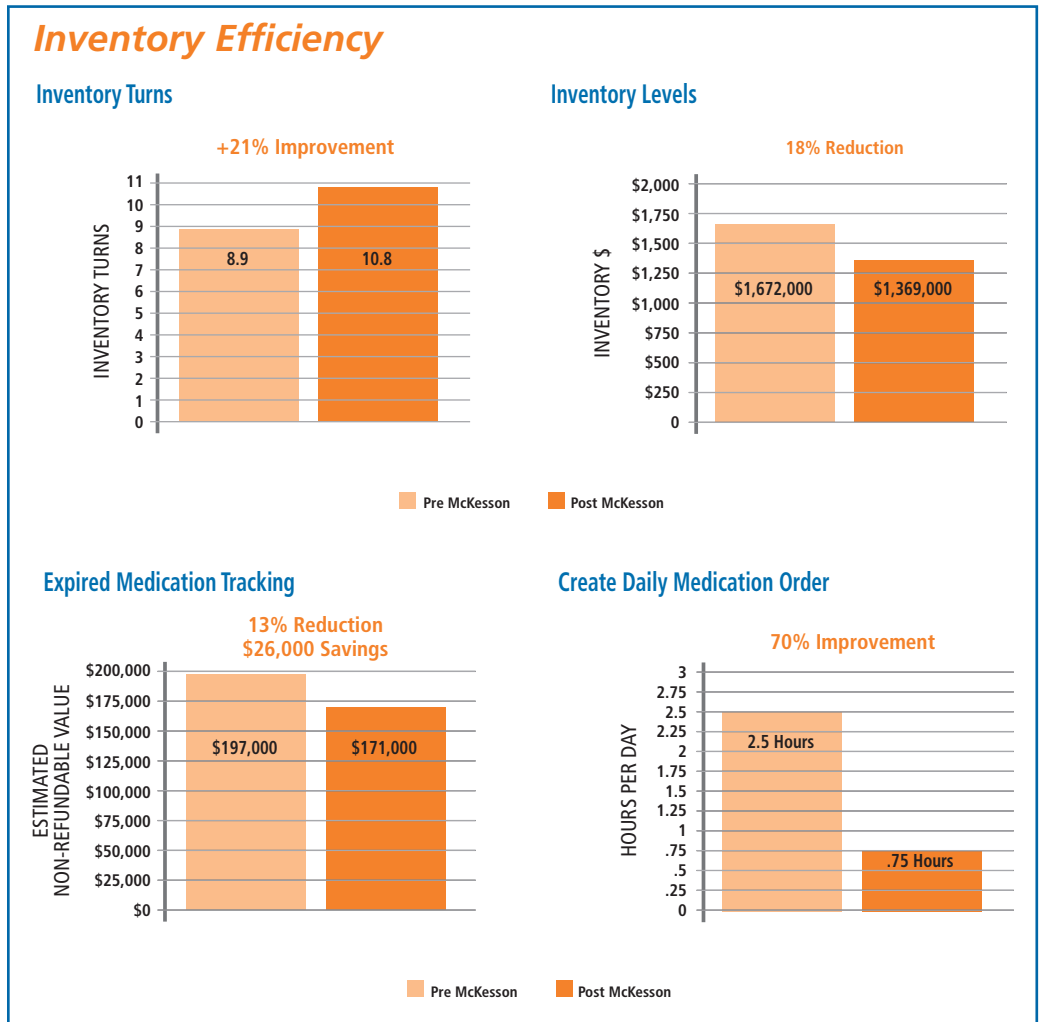
Jeffrey Akers, Pharm.D., MHA, BCPS
 ARH System Director of Pharmacy

- Pharmacist checking labor for the daily cart fill was cut by 75 percent.
- The number of missing medications was slashed by 95 percent.
- The amount of time pharmacists spent on clinical interventions increased 8 percent, resulting in documented cost avoidance of \$197,000 and tangible patient safety gains.

Furthermore, a post-implementation benchmark analysis of pharmacy staff comparing hospitals of similar size and medication volume revealed the cost avoidance of 4.3 pharmacist FTEs system-wide. Therefore, pharmacist services were increased with the same number of pharmacist FTEs.

ARH also made significant gains through integrated inventory control solutions:

- Increased inventory turns 21 percent.
- Cut inventory 18 percent, for first-year savings of more than \$303,000.
- Saved \$26,000 annually, with a 13 percent reduction in medication write-offs.
- Reduced by 75 percent the time required to create and place medication replenishment orders.
- Cut by 60 percent the time to order controlled substances using the DEA's Controlled Substance Ordering System (CSOS) in concert with Fulfill-Rx.



Summary

This independent evaluation demonstrates that the implementation of McKesson's integrated automation solutions will provide significant quantifiable benefits as well as strategic benefits to ARH.

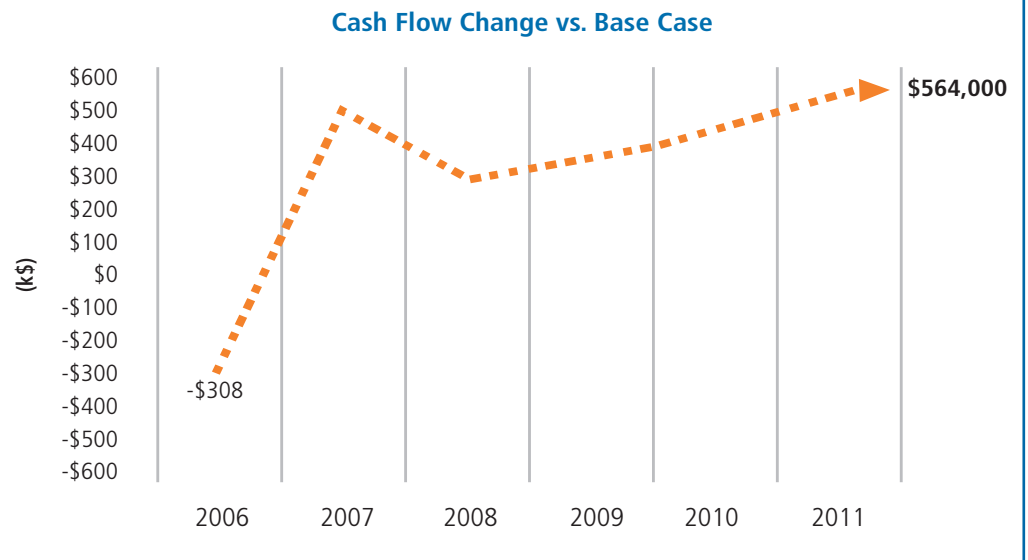
A single-vendor, integrated solutions approach to its medication supply chain provided multiple benefits to ARH. The organization standardized technology, processes, and procedures throughout its nine hospitals; implemented systems faster and more efficiently; and leveraged its real-time data to reduce inventory costs by 18 percent, for a first-year savings of \$303,000.

Overall, these gains resulted in a 33 percent return on investment, with a five-year project net present value of nearly \$1.5 million.

The non-quantitative benefits of the project include:

- Establishing the foundation for electronic, bar-code-based administration of medications at the patient bedside
- Reducing financial risk from a major medication error
- Increasing job enrichment for pharmacists, which aids in recruitment and retention
- Elevating the role of nurses, who now spend more time on patient care and less on expediting medications or tracking down missing doses
- Reducing technician training time
- Empowering staff to develop creative solutions for efficient medication distribution (e.g., pre-prepared surgical trays)

ARH Cash Flow Dollars



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