

Performance Strategies



Automate Medication Safety from the Dockside to the Bedside

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Medication Safety Gains — Moving Forward in Steps



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[Presbyterian Healthcare Services](#) (PHS), which serves more than 650,000 citizens throughout New Mexico, has a strong commitment to improving the quality of care we deliver. We regularly measure how we are doing and use the results to make positive changes. We stand behind our efforts by publishing a performance scorecard on our Web site that compares our performance with other healthcare delivery systems and national benchmarks.

Improving Medication Safety: Evaluating Processes and Workflows

When the Institute of Medicine published *To Err is Human* in 1999, PHS was already evaluating its medication processes in an effort to improve patient safety. The report encouraged us to speed up our automation efforts.

We created a multidisciplinary task force to study our workflows and medication use processes. Our task force recommended a bar-code-driven, centralized robotic drug distribution system, aided by unit-based medication cabinets on patient floors.

First Steps in Implementing Automation

Believing that automating the pharmacy would provide an early medication safety win, we installed McKesson's pharmacy robot in 2001. The robot achieved an accuracy level of 99.9% in stocking bar-coded, unit-dose inpatient medications... and freed up valuable time for pharmacists to spend on more direct patient care activities. We also began preparing for point-of-care bar-code scanning by using a contracted service to bar code patient-specific doses and bulk items. This was made easier by an FDA ruling in 2006 that all drug makers must bar code patient-level drug doses.

Metric Check: Dramatic Impact from Automating the Pharmacy

To determine the effects of automation on overall patient safety, we hired consultants to evaluate the system redesign. They measured medication errors before and after the pharmacy automation. The findings were dramatic: overall, medication administration errors were reduced by 77.9%.

To gain further safety results, we added McKesson's bar-code administration system, which ensures the "five rights" of administration and creates an electronic medication administration record (eMAR). We also added its physician portal, which enables physicians to quickly see doses due and administration times in real-time.

Next Step: Reduce Variances by Targeting Manual Workflows

Next, we added computerized provider order entry (CPOE) with clinical decision support. Using a toolkit, we designed CPOE "iForms" and outlines to reduce the steps required to enter orders, as well as to help drive best practices through decision support. These outlines and iForms enable us to present orders as groups, often with embedded rules and simple calculations to speed up the process of placing orders. Our physicians feel that use of these tools is critical to integrating CPOE into hospital care. Our pharmacists appreciate the order details, which sometimes were missing from paper orders. Most important is the end result — the patient receives the right care in a safer, more efficient way.

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Medication Safety Gains — Moving Forward in Steps (Cont.)

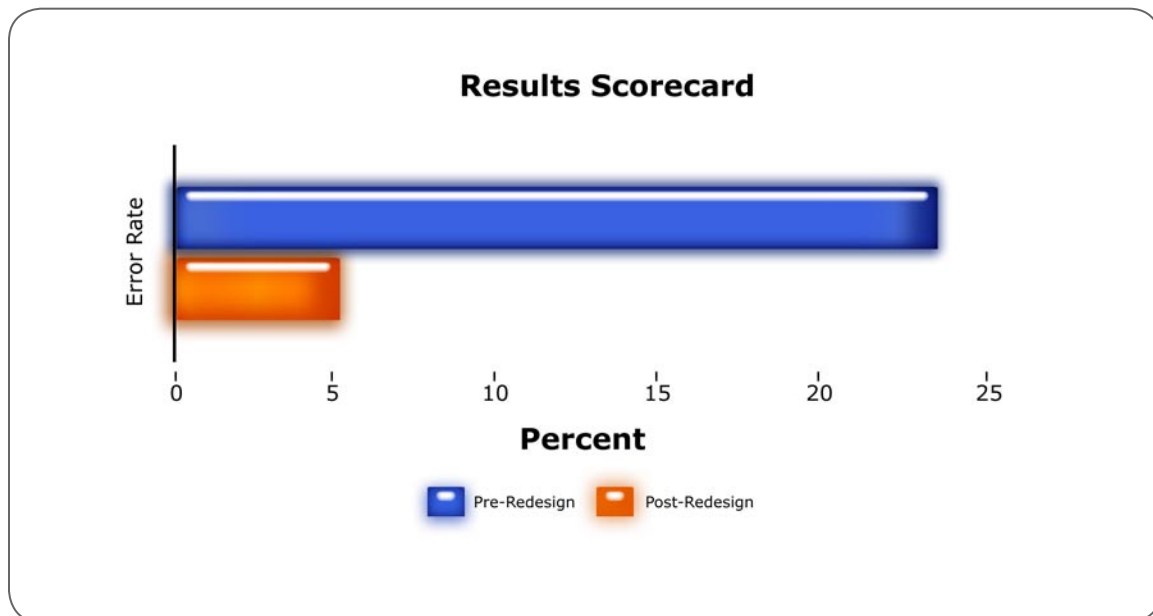
Nurses have adapted relatively easily to the pharmacy component of medication automation, but have been less comfortable using an automated solution to manage documentation related to patient orders and task lists. The ease of adoption for each hospital unit has varied — a big factor is pre-existing paper-based processes. One of our Six Sigma teams is working on a Lean design process to redesign the nursing workflow for greater efficiency and to better leverage automated solutions.

Organizational and Patient Care Benefits

Automating an organization is hard work — it changes everyone's workflow and daily tasks. But it drives a degree of standardization that facilitates best practices across the organization, while still enabling some flexibility. If your organization perseveres, there's no doubt you'll see gains in medication safety and in the efficiency of patient care.

Measuring and reporting metrics related to efforts like medication automation are necessary to gauge the progress your organization is making overall. Clinician and patient stories help validate those metrics and bring home the message on a daily basis. For example, one of our orthopedists responded to a patient with postoperative respiratory distress. After seeing the patient, he sat down at the computer, entered his orders, and within minutes watched an EKG tech, an X-ray tech, and a lab tech show up on the unit. We never saw that kind of response from our paper-based system. These kinds of stories make us say, 'Wow. This works really, really well.'

Mary A. Dallas, MD, started at Presbyterian Medical Group in 1996 as an Internist, and since 2000 she has worked with the group as an Adult Hospitalist Physician. From 2001 to 2006, she was the Medical Director of the Adult Hospitalist Group, managing the Adult Hospitalist Program at Presbyterian and Kaseman Hospitals. Since October 2005, Dr. Dallas has served as the Medical Information Officer of Presbyterian Hospital, with responsibility for strategic planning, development and implementation of clinical information systems. She has completed courses in Medical Informatics, Six Sigma, and project management, and is currently studying for a Masters in Medical Informatics at Northwestern University.



Presbyterian Healthcare Services reduced the Total Errors from 23.5% of medication orders to 5.2% after implementing a pharmacy robot and bar-code point-of-care technologies. An error was defined as a deviation from the physician's medication order as written in the patient's chart. Categories included those defined by the American Society of Health System Pharmacists standards, such as improper dose, wrong dosage form, wrong time and wrong route. When Wrong Time was removed from the calculation, the errors were reduced to 1.9%

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