

"MERCY MEDS" BOOSTS SAFETY

A multidisciplinary effort under way across the Sisters of Mercy Health System (Mercy) promises to do more for patient safety than any other in the system's history. Called "Mercy Meds," this comprehensive transformation of the medication use process incorporates technology, strategic partnerships, supply chain management, and improved work processes to enhance safety and efficiency in the delivery of medications to patients. The initiative seeks to ensure what Mercy calls the "five rights" of medication safety: namely, the right dose of the right drug through the right route at the right time to the right patient.

Mercy, which is based in St. Louis and has hospitals in four states, began implementing Mercy Meds late in 2003. The system expects to complete the initiative's introduction at 10 of its facilities by the end of 2004.

According to the 1999 Institute of Medicine (report, *To Err Is Human*, 7,000 deaths occur annually in U.S. hospitals as a result of preventable medication errors.¹ Adverse medication events occur for a variety of reasons. One cause is failure to distinguish between look-alike packages and sound-alike names—for example, Celebrex,

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an anti-inflammatory agent, and Cerebyx, a seizure disorder medication. The growing number of new medications introduced on the market every year also challenges clinicians' ability to keep current with drug information. Insufficient drug information has been identified as the most common system failure attributed to medication events.

Research shows that between 80 and 200 steps may be associated with the administration in a hospital of a single dose of medication—beginning with the moment a physician prescribes the medication to the moment it is dispensed by the pharmacy and given to the patient.² The largest number of errors occur in prescribing and administering—the first and last steps. Most errors are caught at the prescribing stage; only 2 percent are caught at the administration stage. Because Mercy was no more immune to these errors than other health care organizations, its leaders recognized that new strategies were critical to improving medication safety.

"Mercy Meds" was developed in the fall of 2001 when Mercy's pharmacy directors and other key stakeholders got together to discuss improvements in the structure of pharmacy services in the system's hospitals. At that initial meeting, five key strategies were defined. Mercy would:

- Acquire advanced information systems and automation technology, which would reduce the possibility of human error in prescribing and administering medications
- Manage knowledge through the sharing of information, ideas, protocols, and "best practices" among the system's pharmacies
- Retain and recruit pharmacists by increasing their level of job satisfaction and providing continuing education and training opportunities
- Develop a collaborative-care model of practice by shifting pharmacists' responsibilities from primarily dispensing medications to becoming an



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integral part of the patient care team

- Improve contract and formulary management through shared contract and cost information

By March 2002, Mercy's Leadership Council had endorsed the pharmacy vision. A business plan was approved by December 2002, and work was begun in developing the individual elements needed to restructure pharmacy services across the system. As the process evolved, it became apparent that the initiative was more than a transformation of pharmacy services—it was also an opportunity to transform the entire medication use process. The redesign became a collaborative effort involving hundreds of Mercy clinicians and other staff members, including pharmacists, nurses, physicians, information technologists, process improvement experts, and supply chain specialists. Multidisciplinary teams were formed to focus on five specific aspects of the medication process: pharmaceutical distribution, bar-coding/repackaging, automated cabinetry, bar-code point-of-care technology, and clinical pharmacy and knowledge management strategies (these terms are explained below).

In 2003, the teams worked diligently to design and establish new processes, acquire and implement the necessary technology, and provide staff training and education to comprehensively address the issue of medication safety. When Mercy Meds was introduced at the first Mercy hospital that fall, virtually every aspect of the medication use process—from streamlining how medications are acquired to improving the documentation process—had been transformed.

STEP-BY-STEP REDESIGN

The newly designed process begins at Mercy's Consolidated Services Center (CSC) in Springfield, MO, which serves as a centralized warehouse and distribution center for the entire system. As part of the initiative, Mercy has taken the unique step of becoming its own pharmaceutical distributor. Through a partnership with the nation's largest pharmaceutical wholesaler, AmerisourceBergen, the CSC purchases, stores, repackages, bar-codes, and distributes pharmaceuticals used throughout the system. To take on these tasks, Mercy completed arduous licensing and qualification procedures by federal and state agencies, including the Drug Enforcement Administration and various state boards.

Security and quality are key components of the CSC's pharmacy operation. About \$5 million in drug inventory is protected by an advanced secu-

rity system, including cameras, motion detectors, electric beams, and a vault for controlled substances. Quality measures include rigorous procedures to ensure the integrity and accuracy of the drug repackaging and distribution processes. With all of these quality controls in place, repackaged medications still must pass a final inspection by a licensed pharmacist prior to distribution to a Mercy facility.

The CSC receives pharmaceutical orders through Mercy's electronic ordering system and distributes medications daily to Mercy hospitals via a fleet of secure vehicles and temperature-controlled storage units. At the hospital, the next step in the Mercy Meds process begins. The hospital's pharmacists store many of the pharmaceuticals in computerized drug cabinets on the various nursing units. These cabinets securely store up to 300 different unit-dose, bar-coded medications. The availability of drugs on the nursing floor allows nurses to obtain them in a timely manner once the physician's order has been verified by a pharmacist. This reduces the work performed by pharmacists, who used to dispense medication orders from a central pharmacy. In addition, the cabinets automate the management of drug inventory and can electronically reorder bar-coded drugs directly from the CSC.

The safety aspects of Mercy Meds hinge on pharmaceuticals being distributed in unit-dose, bar-coded packaging. Bar-coding enables the point-of-care medication verification process that nurses use to administer medications to patients. From a computer that can be moved from patient room to room, the nurse uses a handheld scanner to scan his or her own ID badge, then the patient's ID wrist band, and, finally, the medication packaging, thereby verifying accuracy. All of the "five rights" of medication administration must be in place for the bar-coding technology to accept the order: the dose, drug, route of administration, time and patient. If any "right" is not verified, the system issues an alert. In addition to verifying medication accuracy, the computer automatically updates the patient medication administration record in real time. Links to online drug reference resources also are readily available via the computerized technology.

Education has been an important aspect of introducing Mercy Meds in the system. At each facility, nursing "super users" have been selected. Trained in the technology, these "super users" serve as experts during the introduction of the new processes and technology on nursing units.

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In addition, each facility has appointed or hired a "clinical pharmacy coordinator" to guide pharmacy-related training and education. As the initiative's introduction has progressed, lessons learned at each facility are shared with those that have not yet begun implementation. The emphasis on education and collaboration has further strengthened the medication transformation experience.

ENHANCING PHARMACISTS' ROLE

Pharmacists are, of course, the best resource for understanding today's complex medications. By centralizing medication packaging at the CSC and automating many of the distributive aspects, Mercy has freed its pharmacists to be a clinical resource for nurses, physicians, and patients. In doing so, the system is responding to the wish often expressed by patients, family members, and nurses to speak directly to pharmacists. Mercy knows that such contact helps to ensure the appropriate use of medications.

This transformation of the pharmacists' role is being led by the system's team of "clinical coordinators," each of whom is a doctor of pharmacy. The clinical coordinators began their work by standardizing many policies and designing and implementing educational modules aimed at strengthening the role of pharmacists as part of the patient care team. As a result of these efforts, many pharmacists have been deployed to nursing units to provide medication expertise at the point of care. The clinical coordinators are now developing pharmacy education modules designed to provide pharmacists with additional skills sets. In recognition of Mercy's new role in providing continuing pharmacy education, it became accredited by the Accreditation Council for Pharmacy Education in January 2004.

Enhancing the pharmacist's role also aids pharmacist recruitment and retention in the face of strong competition from other health care organizations and from retail operations. Mercy Meds aims to improve pharmacists' job satisfaction through greater patient care interaction, increased collaboration with other health care professionals, continuing education, and an improved workplace environment. Mercy's pharmacies, formerly viewed as merely locations where medications were stored and dispensed, are now becoming an integral clinical service recognized for providing information and expertise.

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A TRUE TEAM EFFORT

Mercy Meds has been a multidisciplinary effort involving knowledge experts from across the system. Although focused primarily on pharmacists and nurses, the initiative has involved many other staff members. These include:

- Process improvement specialists, who worked diligently to conduct current state assessments in hospitals and develop gap analyses relevant to future state design

- Supply chain specialists, who enhanced Mercy's existing distribution operation to enable the addition of pharmaceuticals and implemented a centralized repackaging and bar-coding operation

- Legal services staff members, who assisted with the licensing of operations at the state and federal levels

- Human resources workers, who developed pharmacy-related retention and recruitment strategies and implemented processes to enable the bar-coding of staff members' badges

- Engineers and maintenance workers, who completed a variety of construction-related projects

- Pharmacists, who participated in the implementation of distribution process changes, including the deployment of automated dispensing cabinets and the development of bar-coding processes; they also worked collaboratively to enrich pharmacy education and enhance access to drug information

- Nurses, who worked jointly with pharmacy team members to design processes for medication distribution, administration, and monitoring; they also helped select hardware, computer carts and stands, and other devices needed to support the effort

- Information technology experts, who played a key role in identifying hardware and software requirements, designing and integrating systems, and installing wireless networks

- Physicians, who participated in protocol development, contracting, and making formulary management decisions

- Executive leaders across Mercy, who made the initiative a high priority, thereby making possible the dismantling of potential barriers and the achievement of ambitious timelines

THE INITIATIVE "GOES LIVE"

In early December 2003, Mercy Meds was introduced on the neurology and pediatric floors of St. John's Mercy Medical Center, St. Louis. "Going live" in this way allowed the system to

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THE "SENTINEL EVENTS" STUDY

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THE MINISTRY SHOULD LEAD

A hospital, skilled nursing facility, or clinic is the last place a person should feel unsafe, let alone fear death because of a medical mistake. Catholic health care organizations should not be "close followers" in efforts to improve patient safety throughout the continuum of care. Rather, the Catholic health ministry should lead, taking the risk and spending the dollars to develop, maintain, and continually improve a health care delivery system that is fundamentally safe for all and does not—as is currently the case—allow 268 patients to die daily because of preventable errors. We may be able to tolerate a 4 percent error rate in the U.S. postal system, but it is just unacceptable in the U.S. health care system. □

NOTES

1. Institute of Medicine, *To Err Is Human: Building a Safer Health System*, National Academies Press, Washington, DC, 2000. The report recommended a four-tier approach in enhancing hospital safety: (1) Establish a national focus; (2) expect hospitals to have a voluntary reporting system; (3) raise performance standards and expectations; and (4) implement safety systems at the delivery end.
2. Institute of Medicine, *Crossing the Quality Chasm: A New Health System for the 21st Century*, National Academies Press, Washington, DC, 2001.
3. "Patient safety" is understood to be an inclusive term applicable across the health care continuum; it is not restricted to acute care settings alone.
4. Charles Perrow, *Normal Accidents: Living with High-Risk Technologies*, Princeton University Press, Princeton, NJ, 1999.
5. James T. Reason, *Managing the Risks of Organizational Accidents*, Ashgate Publishing, Aldershot, England, 1997, p. 25. See also James T. Reason, *Human Error*, Cambridge University Press, New York City, 1990.
6. Reason, *Managing the Risks*, p. 9.
7. Robert Wachter and Kaveh Shojania, *Internal Bleeding: The Truth behind America's Terrifying Epidemic of Medical Mistakes*, Rugged Land, New York City, 2004, pp. 165-167.

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use the new technology and processes in a patient care setting and revealed a need for further modifications and improvements. But it also clearly demonstrated Mercy Meds's ability to detect potential medication errors and improve patient safety.

As of October 2004, Mercy Meds was in service to approximately 900 patient beds at seven system facilities. To date, detailed data has been reviewed on more than 90,000 administrations, indicating that Mercy Meds point-of-care technology has prevented 386 potential errors. Because point-of-care technology alerts staff to a potential medication error *before* the medication can be administered, it is helping the system shift from reactive post-event medication reporting to proactive "near-miss" reporting. Near-miss data can be analyzed even further so as to reduce the possibility of future medication events.

Clinical pharmacy services also are beginning to positively affect the medication use process. As of August 2004, more than 50,000 pharmacist encounters had been documented; each of these encounters contributes to improved patient education and safety, cost-effective care, and positive clinical outcomes.

The entire Mercy Meds experience has strengthened the sense of "systemness" at Mercy, through increased interaction among facilities and professional disciplines, especially nursing and pharmacy. Through process redesign and implementation, staff members have gained a greater appreciation and understanding of the value of collaboration and coordination and of the benefits that can be achieved from them. □

NOTES

1. Institute of Medicine, *To Err Is Human: Building a Safer Health Care System*, National Academies Press, Washington, DC, 2000, p. 2.
2. "Pharmacy-Nursing Shared Vision for Safe Medication Use in Hospitals: Executive Session Summary," *American Journal of Health System Pharmacy*, May 15, 2003, p. 1,046.

DIVERSITY IN MULTI-INSTITUTIONAL SETTINGS

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Carney: I attended a conference on diversity sponsored by the Conference Board.* It was absolutely wonderful, but I was the only participant from a health care *provider*, which was a little surprising to me. There were participants from pharmaceutical and medical supply companies. An organization like the Conference Board is a great source of information.

Sr. Teresa: I think it would be helpful for our members if we could put some of the diversity resources developed by various systems on CHA's website. Could we, for example, put on the site *CultureVision*, the tool developed by BSHSI and Cook Ross? I'm sure that CHA's Diversity Committee could profit from studying it.

Carney: BSHSI would be happy to make available any resource within its domain. However, Rod will have to explore any legal ramifications regarding sharing *CultureVision*. But I expect that if *CultureVision* has the merits we think it has, Cook Ross will certainly be interested in getting a broader visibility for it.

Sr. Karin: *Chris, I want to thank you and Rod for being willing to share your experiences. We hope that others will be inspired by what you have done and will think more seriously about diversity. Diversity is not yet, I suspect, a top priority for all of our CEOs, but I think it's time for it to become a top priority. We certainly hope that, through this series of articles, we will enhance awareness of the importance of diversity in Catholic health care.*

Carney: If CEOs are not committed to diversity personally, it will become even more of a challenge than it is now. □

*The Conference Board (www.conference-board.org/) is a not-for-profit organization that advises businesses on management and market questions.