

Improving the Quality of Care: A Regional Medication-Safety Effort

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After the Institute of Medicine (IOM) released its landmark report, "To Err is Human: Building a Safer Health System," the Delaware Valley Hospital Council (DVHC) began to consider programs that could enhance patient safety and quality of care in its member organizations. After deliberation, the DVHC decided to embark on a program that would assist member institutions by focusing on one critical aspect of patient safety—reducing medication errors. Through its charitable foundation affiliate, the Health Care Improvement Foundation, the DVHC partnered with two local organizations, the Institute for Safe Medication Practices (ISMP) and ECRI. This partnership has resulted in a unique and exceptional combination of access, knowledge, and technical assistance. Working collaboratively, the three organizations developed the Regional Medication Safety Program for Hospitals (RMSPH). Although many institutions were already working individually to enhance the quality of their services and improve patient safety, it was felt that the hospitals in the Delaware Valley region would benefit from this region-wide coordinated campaign.

PROGRAM CONTENT

The program, designed for implementation over a two-year period, involves all stakeholders within each hospital, including the governing board, senior management, medical staff, and employees; and it solicits participation from patients and the community. The RMSPH supports the systematic implementation of sixteen medication-safety goals, or "action goals," as part of a strategic and cohesive program. Because the P&T committee oversees the medication-use process in most institutions, consideration of these goals (along with subsequent implementation) will fall under the purview of the P&T committee. These 16 goals represent four distinct areas: institutional culture, infrastructure, clinical practice, and technology. The goals are listed below, with a brief description of the implications of each for participating hospitals.

Institutional Culture

- *The organization should commitment to a culture of safety and create a non-punitive environment that encourages medication-error reporting and a focus on system-based causes of errors.*

The organization is expected to uphold a patient-safety philosophy, as reflected in the Board of Trustee minutes, the organization's mission statement, and administrative support. One of the most difficult recommendations to effect under this goal is the shift to a "non-punitive" environment; most health care organizations have traditionally invoked a punitive approach to errors committed in the

workplace, and corrective actions have focused on disciplining the individual(s) involved in the error. The organization must now focus on the systems that allowed the error to occur, rather than on individuals. Human resource policies must be revised to incorporate this change in philosophy, and the organization must effectively communicate the change, to encourage employees to report incidents and near-misses without fear of disciplinary action. The term "non-punitive" should not be misconstrued to mean non-accountable, however. There are situations in which discipline is appropriate—blatant disregard of policy, intentional commission of an error, or unlawful or egregious behavior, for example. Each organization must define such situations and, again, effectively communicate those to employees.

- *Develop a medication-safety education program for all new and existing employees.*

Under the direction of the P&T committee, medication-safety orientation materials should be developed for the disciplines involved in the medication-use process. Although many of the steps involved in medication safety are common to all disciplines, each discipline has a unique role in ensuring that patients receive their intended medications. Therefore, the organization should consider developing separate informational pieces for physicians, pharmacists, nurses, pharmacy technicians/students, and other professionals (e.g., respiratory therapists, radiology technicians). Much of the content included in such a program is already included in employee orientation, but it might be presented in a somewhat fragmented manner; an effort to consolidate this information into one place to serve as a useful reference might be warranted. Such a document, appropriately updated to reflect current medication-safety issues, can serve as a means for annual education and as a basis for assessing employee competence. Also included under this goal: the organization should work through the appropriate patient-education committee to develop a patient information sheet describing the patient's role in ensuring his/her safety while in the hospital (and upon discharge). Medication safety is one component of this effort.

- *Recognize safety innovations.*

Employee involvement in medication safety should be encouraged by the organization. It might be productive to implement an employee-suggestion program for improving medication safety. Front-line employees who routinely work within the system might view processes differently than management, and could see opportunities for improvement that management might miss. Reward programs should be developed for employees who make suggestions that are successfully implemented. Recognition of an employee who has suggested a safety innovation might spur other employees to do the same. It is also important to ensure that

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employees receive feedback on system changes, to underscore the organization's commitment to medication safety.

- *Disclose medical errors to patients.*

To be consistent with new Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards, the organization must develop procedures for informing patients when errors have occurred. The policy should include a statement indicating who, within the organization, is responsible for providing this disclosure, and should also include guidelines on how the facts should be disclosed. An effective employee-assistance program should be available for staff who are involved in medication errors and might require emotional support in the aftermath.

Infrastructure

- *Designate a patient-safety officer and form a multidisciplinary patient-safety team.*

Although it is important to stress that medication safety is the responsibility of all individuals involved in the medication-use process, supervision of the process should be delegated to a patient-safety officer. This individual should be charged with ensuring that medication-safety efforts are coordinated throughout the organization, across departments and committees. A multidisciplinary team, reporting to the P&T committee (the team could be the P&T committee itself, in smaller facilities), should exist to promote medication-safety issues. Such a team must include front-line staff, management, and medical staff. A physician champion should be identified, as he/she is critical to gaining buy-in from medical staff.

- *Use clinical pharmacists in high-risk patient care areas.*

Numerous studies have shown that incorporating a pharmacist into the patient-care team can positively affect patient safety. Priority should be given to the high-risk areas of the organization (e.g., oncology, critical care, transplant services), where drugs with a lower margin of safety are commonly used. The challenge in today's environment is convincing hospital administration of the economic necessity of providing such services. Also, given the present shortage of pharmacists in many areas of the country, pharmacy directors must be creative in allocating the necessary time for pharmacists.

- *Establish area-specific guidelines for drug stock.*

Organizations must take a critical look at the medications that are stocked outside of the pharmacy on patient-care units. Medications must be assessed from a safety perspective to determine their appropriateness for a given unit. The skill level of the caregivers on the unit, as well as their ability to monitor response to the medications and respond to problems, must be considered. The physical setup of the drug stock (even within an automated dispensing unit) should separate look-alike or sound-alike drugs from one other, so as to minimize the chance of confusing the drugs. Drugs should be in a form that requires minimal manipulation by caregivers prior to administering them to patients. Ideally, automated dispensing units would interface with the pharmacy profile so that, with the few

exceptions allowed by JCAHO, medications cannot be removed unless they have been reviewed and approved by a pharmacist.

- *Establish protocols for obtaining and communicating essential patient information.*

The safe use of medications requires that appropriate patient information (e.g., allergies, height, weight, and laboratory values) be available to the caregiver at the time of medication ordering/processing/administration. Information systems and order forms should be designed to capture the information deemed necessary by the organization and regulatory bodies. Information systems that are integrated across departments can ensure that such information is available. For example, an interface that uses the patient's serum creatinine, height, and weight can calculate an estimated creatinine clearance; this information can then be presented to the user at the time of order entry/processing for medications requiring adjustment for renal function. Procedures for ensuring the proper identification of inpatients and outpatients prior to medication administration should also be included in this action goal.

Clinical Practice

- *Eliminate dangerous abbreviations and dose designations.*

Traditionally, organizations have published lists of approved abbreviations that may be used in the medication-ordering process. However, despite these lists, other abbreviations continue to be used, many of which cause confusion and resultant medication errors. The P&T committee should consider developing a list of dangerous drug abbreviations and dosage conventions (e.g., simply writing "u" for units, failing to use a leading zero). This list must be promulgated to the medical, nursing, and pharmacy staffs during orientation and on an ongoing basis. Computer systems, pre-printed order sets, protocols, and clinical pathways should be assessed for the presence of these abbreviations. The organization might consider providing constructive feedback to practitioners who continue to use inappropriate order conventions.

- *Implement strategies for high-alert drugs.*

JCAHO requires organizations to identify high-alert medications used within their facilities. This should be a function of the P&T committee, and a plan of action should be developed to minimize the risk of errors with these drugs. For example, the committee might limit the number of locations in which a given medication may be stored, restrict who may administer the medication, or require a documented doublecheck of the medication by two caregivers prior to drug administration. A process to formalize the potential actions to be taken to minimize the potential for error with high-alert drugs will likely show that an organization already carries out a number of proactive steps without a formalized process in place.

- *Implement safety checklists for infusion pumps.*

Despite advances in infusion-pump technology, errors continue to occur with these devices, and because the more dangerous drugs are often administered via a pump, the potential effects of an error can be serious. The P&T committee, or the committee that

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deals with biomedical safety equipment, should ensure that personnel who use infusion pumps have documented training in their use; the safety checklists for the use of the pump are available to staff (ideally, the checklist should be attached to the pump); and that the biomedical department assesses infusion-pump safety and performance.

- *Develop limitations and safeguards for verbal orders.*

Verbal orders are another source of potential errors because orders can be misinterpreted when given by a physician to another care provider. Institutional policy should limit those circumstances in which a verbal order may be taken, and should outline the procedure to be followed by the individuals giving and receiving the orders. In view of the widespread availability of fax machines, the transmission of a written copy of an order or outpatient prescription is preferable to verbal transmission.

- *Perform failure mode and effects analysis as part of drug and equipment procurement.*

Failure mode and effects analysis (FMEA) is a proactive root-cause analysis (i.e., an effort to predict what errors could occur, and building safeguards into the system to prevent or minimize the effects of such errors). P&T committees should conduct an FMEA on each medication being considered for addition to the formulary. The analysis should examine each point in the medication process (ordering, storing, dispensing, administering, and monitoring) to determine potential "failure modes." Involvement of front-line staff is critical to ensuring the validity of the analysis. The results of the FMEA can be used to determine whether a drug is to be considered high-alert. FMEA can also be applied to the purchase of equipment or when a new brand/manufacturer of a formulary product is being considered.

- *Implement triggers and markers to indicate potential adverse medication events.*

The P&T committee should work to develop a list of triggers that can be used to identify actual or potential medication errors, adverse drug reactions, or problems with medication use. For example, an increase in the use of Vitamin K injection (the trigger) could signal a problem with the prescribing of warfarin, or a laboratory problem with measuring the international normalizing ratio (INR). As another example, an information system could be used to alert a physician when a patient is receiving a potentially nephrotoxic drug, and a significant increase in serum creatinine has occurred. Depending on the capabilities of the information system used, an organization can effectively use triggers to improve the care of its patients.

Technology

- *Eliminate the use of infusion pumps without free-flow protection.*

Organizations that continue to utilize infusion pumps that do not have set-based free-flow protection should develop plans for purchasing free-flow protected devices. Pumps that allow free flow to occur represent a significant risk to patient safety and a liability to the hospital. Until such pumps can be eliminated from an organization, caregivers should be educated on the dangers of free flow. This education should

include all employees who could come into direct contact with the patient (e.g., patient transport staff, radiology technicians).

- *Prepare for the implementation of computerized prescriber order entry (CPOE).*

CPOE systems have been promoted to address many of the ordering problems that contribute to medication errors (e.g., illegible orders, incomplete orders, and the use of dangerous abbreviations). Such systems can also reduce the need for verbal orders, because access to a terminal, rather than to the patient chart, allows the physician to place an order. In addition, orders can be checked for dosage, interactions, and duplication, and the physician can be notified of these problems at the time of prescribing. Some CPOE systems allow for expert rules that can improve medication prescribing. Another factor driving hospitals to investigate CPOE systems is pressure from outside groups (e.g., the Leapfrog Group) that steer patients to organizations with CPOE systems in place.

Tools

Several tools were developed to assist each hospital in the implementation process for the goals. The "toolkit" provided to each organization consisted of a medication-safety binder, a series of "10 safe practices" campaign posters, along with a plan for rolling out and displaying the posters in the institution, and a practical guide for CPOE.

The medication-safety binder was designed as a "how-to" manual, containing safety checklists for high-alert drugs and infusion pumps, medication safety pledges for patients, sample policies and job descriptions, recommendations for implementing the steps necessary to achieve the goals, and a description of the successful implementation of each goal. The multicolor safe-practices posters focus on several of the action goals (e.g., safety innovation, floor-stock guidelines, essential patient information, dangerous abbreviations, high-alert medications, verbal orders, and the use of triggers to capture adverse drug events). Each of these posters supports the information found in the binder for the corresponding action goal. The posters can be combined with internal education programs and in-services to allow each institution to systematically address the key issues surrounding each goal. A separate publication, "Computerized Prescriber Order-Entry Systems – A Practical Guide," provides detailed planning guidance and acquisition tools to assist the hospitals as they move toward a CPOE system environment. The guide also includes comparison charts of available systems, a request-for-proposal template, and a proposal analysis matrix.

The RMSPH also included a pre- and post-survey tool for each hospital. A catalog of questions was developed, focusing on the 16 action goals. Selected questions were incorporated into different versions of the survey tool, which were then distributed to employees in 18 different clinical and management functions throughout the organization. This survey was distributed prior to the initiation of the program to determine the employees' perception of the organization's medication-safety practices around the action goals. The same survey will be redistributed to employees with the same job classifications at the completion of the program and the aggregate data from the two surveys will be analyzed to determine whether the perception has changed as a result of the program.

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Program Roll-out

A series of meetings was held to introduce the program. The first meeting was designed to introduce the program to members of the hospital leadership. Invitations were extended to representatives from the governing board, senior management, and medical staff leadership. At this meeting, the program was described and the point was made that this program would dovetail with any other patient-safety initiatives in which the hospital was participating. Two additional meetings were held for the risk managers and the directors of pharmacy from each organization.

After these kick-off meetings, the patient-safety officer for each organization was invited to two full-day training sessions. At these sessions, presenters from ISMP and ECRI described the program and reviewed the 16 action goals. The safe practice campaigns posters, the medication-safety binders and tools created to assist in the implementation were distributed to the safety officers.

Throughout the program, patient-safety officers were invited to participate in informal workshops, which focused on the four key areas. These workshops provided a forum for describing obstacles that were being encountered, and for sharing ideas and successes that had been realized. Several different individuals, including pharmacy directors, patient-safety officers, risk managers, and performance improvement coordinators, attended these workshops.

On-site Survey: Looking Ahead

An integral part of the RMSPH's plan for the future is a one-day on-site review that will be performed by a team of two individuals, one each from ISMP and ECRI. The purpose of the site visit is to assess the progress that each organization has made with the implementation of the program. This on-site review will consist of interviews with several key individuals in the organization, a review of selected documents and policies, and direct observations of the various aspects of the medication-use process. After the on-site visit, each organization will receive a written action plan providing recommendations to assist in the implementation of the action goals.

CONCLUSION

The two landmark IOM reports ("To Err is Human: Building a Safer Health System" and "Crossing the Quality Chasm: A New Health System for the 21st Century") have focused a bright spotlight on patient safety and its connection to quality of care. Multiple national organizations and purchasing alliances have developed programs with curricula heavily focused on patient and medication safety. The new JCAHO standards published in July 2001 address patient safety, as well as the reduction and disclosure of medical errors. The RMSPH was designed to coordinate with these efforts rather than duplicating them. Institutions that implement the 16 action goals will be satisfying several of the JCAHO standards and moving toward compliance with others.

The toolkit for the RMSPH is available to hospitals outside the greater Philadelphia area. For more information about the RMSPH, please visit www.ecri/medicationsafety.org. ■