Pharmacies Use Technology, QI Techniques to Reduce Errors

Health care organizations should use up-to-date technology to improve the efficiency and effectiveness of medication management systems in order to avoid medication errors, pharmacy management experts say. Technologies such as bar-coded unit-dose medications, handheld wireless devices, and computerized prescriber order entry (CPOE) can improve patient safety.

“Implementation of technology is necessary to improve the safety of medications,” says Thomas P. Lombardi, PharmD, clinical pharmacy coordinator for St. Peter’s Hospital, in Albany, N.Y. “Use of radio frequency handheld devices, computerized order entry systems, bar-coded medications, and an active quality improvement program to assess medication safety are required to effectively manage medication safety.” A 450-bed acute-care institution, St. Peter’s is implementing a CPOE system, anticipated to cost $4 million to $5 million, to improve medication safety.

**Real-Time Data**

The integrated medication management system that St. Peter’s is implementing is from Autros Healthcare Solutions, in Toronto. It includes physician (or prescriber) computer order entry, clinical monitoring, ongoing medication and administration records, and stationary and mobile electronic dispensing cabinets that incorporate bar-code and radio frequency technologies.

“An advantage of this system is real-time availability of information, which allows for more accurate prescribing, dispensing, and administration of medications,” Lombardi says. “The cost of the system has never been the key issue to our administration. We believe implementing an effective CPOE will improve the quality of care.”

Computerized prescription monitoring systems can drastically reduce the number of medical errors in U.S. hospitals, potentially saving tens of thousands of lives each year, says David W. Bates, MD, chief of general medicine at Harvard’s Brigham and Women’s Hospital, in Boston.

CPOE systems reduce prescription errors by storing detailed data on all drugs physicians might order for patients. The computer system flags potentially dangerous drug interactions and prevents physicians and pharmacists from accidentally ordering or delivering drugs in the wrong amounts. CPOE systems also are sensitive to issues raised by unclear handwriting and drugs with similar names.
**EDITORIAL**

**Government Programs Target Medication Errors**

The federal government is calling on health care systems to improve patient safety practices in hospitals, clinics, nursing homes, doctors’ offices, and other settings. In addressing the Senate’s Health, Education, Labor, and Pensions Committee in May, Tommy G. Thompson, secretary of the Department of Health and Human Services, says, “It is critical for all of these organizations to develop their own internal processes and activities for addressing their particular safety problems.”

A recent report by the federal Agency for Healthcare Research and Quality, in Rockville, Md., says adverse drug events (ADEs) cause more than 770,000 injuries and deaths each year and cost as much as $5.6 million per hospital. Many ADE injuries and resulting hospital costs can be reduced if hospitals make changes to their systems for preventing and detecting ADEs, AHRQ says.

The report, “Reducing and Preventing Adverse Drug Events to Decrease Hospital Costs,” says 28% to 95% of ADEs can be prevented by reducing medication errors through computerized monitoring systems. Also, computerized medication order entry can prevent an estimated 84% of dose, frequency, and prescription routing errors. AHRQ also says that hospitals can save as much as $500,000 annually in direct costs by using computerized systems.

Studies attribute more than 42% of ADEs to excessive drug dosage for the patient’s age, weight, underlying condition, and renal function. Yet systems are available to prompt doctors to consider these factors when ordering medications, AHRQ says. The full report is available at www.ahrq.gov/qual/aderia/aderia.htm.

The problems in the system are well documented, Thompson says, and they are not solely the fault of individual doctors, nurses, or other clinicians. “Rather,” he says, “these errors are the result of systems of care that are not adequately designed to prevent errors and their consequences.”

Pharmacists, physicians, and other health care providers should be encouraged to come forward with information about their medical mistakes and problems, Thompson says, so that the government and health care organizations can track errors and develop methods to reduce or eliminate them. HHS’s goal, and the goal of all patient safety initiatives, should be to reduce medical mistakes, not to punish providers, he says. For that reason, confidentiality of the data collected is essential.

As we have done in the past, we continue to follow the problems surrounding medication errors and adverse drug events. In this issue, we have articles on efforts in Massachusetts and New York to develop systems to reduce these errors. In future issues, we will write about the steps specific health care systems are taking to meet Thompson’s call to action.

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Coalition Develops Pioneering Error-Prevention Effort

Hospitals nationwide are seeking to reduce medical errors, but hospitals in Massachusetts may have produced the most far-reaching results to date in their efforts to do so. Almost all hospitals in the state have taken steps to cut medication errors, and more than two thirds have fully implemented a 12-step medication error reduction program, according to a survey by the Massachusetts Coalition for the Prevention of Medical Errors.

“Our collective efforts have shown that patient safety is a goal that we can all work toward, despite perceived hurdles and adversity,” says Connie Crowley Ganser, MS, RNC, past president of the Massachusetts Organization of Nurse Executives and co-chair of the coalition. Widely regarded as the first organization of its kind, the coalition is considered a model of public-private collaboration in the national patient safety movement. In February, the coalition and the Massachusetts Hospital Association announced findings of a two-year effort among hospitals to adopt a set of best practices to reduce medication errors.

Statewide Partnership
Founded in 1997 by the MHA and the Massachusetts Department of Health, the coalition was formed to develop and implement a statewide initiative to improve patient safety and reduce the frequency and severity of medical errors. The coalition (at www.mhalink.org/mcpme) is a partnership of hospitals, nurses, physicians, regulators, pharmacists, academics, government officials, consumers, and others. While the coalition’s efforts have focused on hospitals, its mission encompasses initiatives aimed at all health care providers, says Leslie Kirle, MPH, MHA’s senior director of clinical policy and patient advocacy.

The survey is significant because it represents the first time that hospitals in the state have agreed on a set of best medication practices, measured their progress in implementing those practices, and publicly reported on the findings, experts say.

The survey results suggest that Massachusetts hospitals “have made medication safety a top priority,” Ganser says. Out of 68 hospitals operating in the state, 61 replied to the questionnaire. To encourage candor, the MHA released the survey results in aggregate rather than by facility, Kirle says. The findings show that among hospitals in the state, 98% have started what Ganser calls “a systems approach,” meaning the hospitals have changed their organizational cultures to address the entire medication management process. Conversely, it is typical in health care for organizations making changes to do so with a series of disjointed steps, Ganser explains.

About 88% of the hospitals have begun to establish a nonpunitive atmosphere for reporting errors, thereby encouraging more open discussion than currently exists about the causes of errors and how to prevent them. Some 92% of the hospitals have fully implemented unit-dose systems, eliminating the need for last-minute calculation and measurement.

Among hospital pharmacies, 95% have begun to use computerized systems. Only 2% of hospitals have implemented a computerized order entry system, but 13% of hospitals have begun to implement such systems and many more have researched the feasibility of doing so.

Among hospital pharmacies in Massachusetts, 95% have begun to use computerized systems to help prevent errors.

Nearly all hospitals, 97%, have 24-hour access to pharmacy expertise through on-call services.

Significant numbers of hospitals have adopted new storage procedures for potassium, heparin, sodium chloride solutions, insulin, and narcotics. Among respondents, 87% reported having removed concentrated potassium from general patient floors, and 74% removed it from intensive care and dialysis units.

While these results point to considerable progress in medication error reduction, the survey also identified areas in need of improvement: training staff, especially for physicians; increasing patient education; establishing a framework for implementing computer-physician order entry programs; and continuing efforts to

(Continued on page 4)
promote standardization of equipment and prescribing practices.

The coalition is remarkable not only for its medication accomplishments, but also for its spirit of teamwork and voluntarism, Ganser says. “To have representatives from every type of health care facility voluntarily working together toward a common goal—patient safety—and achieving what we set out to, is quite remarkable and perhaps our greatest achievement,” says Frank Federico, RPh, a loss prevention specialist and project manager at the Risk Management Foundation, in Cambridge, Mass. RMF, which owns a self-funded malpractice insurance program covering Harvard medical institutions, develops strategies to address medical error prevention.

Since the survey results were released, administrators at several hospitals and other health care organizations outside of Massachusetts have asked Federico how the coalition conducted the survey and achieved its results. Federico is a member of the coalition’s Medical Error Consensus Panel and a leader of the Consensus Group for the Reduction of Medication Errors. Both the consensus panel and the consensus group are coalition committees.

**Best Practices Targeted**

When it started in 1996, the coalition had three goals: to establish ways to identify and implement best practices to minimize medical errors, to increase public and professional awareness of error-prevention strategies, and to minimize duplication of requirements from state regulatory agencies and the Joint Commission for the Accreditation of Healthcare Organizations, in Oak Brook Terrace, Ill., which accredits hospitals. By eliminating duplication, coalition members hope error-prevention efforts can focus on initiatives that can improve patient care most effectively.

“Massachusetts has two state mandatory systems for reporting of adverse events: the state Department of Public Health and the Board of Registration in Medicine,” Kirle says. “At the same time, hospitals are accountable to several external oversight agencies with related goals but different requirements. The result is often overlapping and duplicative requirements, which are confusing, costly, and wasteful,” she adds. Therefore, the coalition is helping to make the current reporting regulations more workable, in part by identifying areas of mutual interest among participants.

Part of the coalition’s mission is to

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**Short- and Long-Term Recommendations**

The Massachusetts Coalition for the Prevention of Medical Errors has made 12 recommendations for reducing medication errors in hospitals.

The first eight are short-term recommendations, as follows:

1. Maintain unit-dose distribution systems (either manufacturer prepared or repackaged by pharmacy) for all nonemergency medications.
2. Institute pharmacy-based IV admixture systems.
3. Remove concentrated potassium chloride vials from nursing units and patient care areas. Stock only diluted premixed IV solutions on units.
4. Develop special procedures for high-risk drugs using a multidisciplinary approach.
5. Make information on new drugs, infrequently used drugs, and nonformulary drugs easily accessible to clinicians prior to ordering, dispensing, and administering medications.
6. Provide physicians, nurses, pharmacists, and other clinicians with education on ordering, dispensing, administering, and monitoring medications.
7. Educate patients in the hospital, at discharge, and in ambulatory settings about the safe and accurate use of medications.
8. Have a pharmacist available on-call after hours of pharmacy operation.

The four long-term recommendations are as follows:

1. Implement computerized physician order entry when technologically and financially feasible.
2. Encourage pharmacy software vendors to incorporate an adequate standardized set of checks into computerized hospital pharmacy systems.
3. Encourage the use of computer-generated or electronic medication administration records.
4. Consider using machine-readable coding in medication administration.

Source: MHA Best Practice Recommendations to Reduce Medication Errors Report, Massachusetts Hospital Association, Boston, 1999.
conduct education programs on such topics as implementation strategies for the best practice recommendations. The coalition also hosts forums at local hospitals to address the public and to exchange information. Working in collaboration with the MHA, the coalition has published a brochure that is distributed to hospitals, pharmacies, clinics, and libraries containing information on what consumers can do to help prevent medication errors.

Preventing Errors
The first objective of the Medication Error Prevention Project was to outline the steps necessary to identify the best approaches to safe medication practices. To meet this objective, the coalition members needed to:
- Target major sentinel events or serious incidents for the development of prevention strategies
- Research the causes of the targeted errors under study and develop recommendations to be carried out by a subcommittee on best practices
- Submit the best-practice recommendations to groups responsible for building a consensus on prevention strategies.

From the beginning, members of the coalition wanted to foster a systems-oriented approach to medication error reduction, and they wanted to promote a nonpunitive atmosphere for error reporting.

After setting goals and objectives, the coalition used a survey tool developed by MHA and the Institute for Safe Medication Practices, to collect baseline data on the different approaches hospitals were using to foster safe medication administration practices. The ISMP, in Huntingdon Valley, Pa., provides education on safe medication practices.

Working with the coalition and a group of experts, the MHA integrated the baseline survey results with research on the known causes and remedies of medication errors. This information was used to build consensus on specific actions health care institutions and providers could take to reduce the potential for errors. This work resulted in the release of MHA Best Practice Recommendations to Reduce Medication Errors Report in March 1999. The board of trustees of the MHA, the coalition, and the state Department of Public Health endorsed the best practices and distributed them to hospitals statewide.

The MHA’s report consisted of eight recommendations that could be accomplished in a reasonably short time (such as one year), and four long-term recommendations that focus on improvements requiring substantial changes to existing organizational systems, including such technological changes as implementing computer order-entry systems.

Twelve months after these recommendations were issued, in the spring of 2000, the MHA’s survey was sent to 68 of the state’s acute-care hospitals to measure their progress in implementing the best practices.

Financial Challenges
The coalition’s results show that making strides in eliminating medication errors is possible even while almost two thirds of the state’s hospitals are losing money. Some hospitals in Pennsylvania have joined together to start a program to reduce medication errors, and they are facing similar financial challenges, says Andrew Wigglesworth, president of The Delaware Valley Healthcare Council, in Philadelphia. The DVHC is developing a medical error prevention program called the Regional Medication Safety Program for Hospitals. The initiative is a result of a partnership between DVHC, ISMP, and the ECRI (formerly referred to as the Emergency Care Research Institute), an independent, nonprofit health services research organization, in Plymouth Meeting, Pa. The initiative will help 70 southeastern Pennsylvania hospitals implement error-reduction programs.

While a majority of the program’s funding is being sought from philanthropies, the hospitals and health systems in the region are contributing $500,000 to launch the effort. The funding for the DVHC program “is just a small fraction of the substantial resources and staff every hospital already commits to improving quality of care and patient safety,” Wigglesworth says.

Despite hospitals’ readiness to make improvements, money is not the only factor precluding some hospitals from achieving their patient safety objectives, Ganser says. “Clearly, financial resources are an issue, but never before has it been so important that we’re all sharing what we’re learning and moving forward with implementing best practices,” she comments.

A significant challenge for the coalition, and the patient safety movement as a whole, Ganser says, is “taking the lessons we’ve learned and applying them not only to hospitals, but to the entire health care system.”

—Reported and written by Susan Howell, in Greenville, N.C. More information on quality management strategies is available on our Web site (at www.qualityindicator.com).
Consultant pharmacists make a quantifiable and significant improvement in the quality of care nursing home residents receive, according to the Fleetwood project. A three-part research study by the American Society of Consultant Pharmacists (ASCP), in Alexandria, Va., and currently in its third phase, the project is seeking sites to evaluate a treatment model that can improve therapeutic outcomes.

The researchers believe that consultant pharmacists can improve outcomes significantly and save billions of dollars annually in costs by avoiding many medication-related problems for elderly patients, says Kathleen Cameron, executive director of ASCP’s Research and Education Foundation.

Reengineering Pharmacy

“The purpose of the project is to reengineer the role of the consultant pharmacist,” Cameron says. “Used effectively, this model protects patients from adverse drug reactions, inappropriate drug selections, or missed indications.”

The project verifies the value of consultant officials. The findings of the project and the resulting treatment model can be useful in encouraging facilities to expand the role of consultant pharmacists and to pay more for their services, says Patricia Sacco, a consultant pharmacist with the Rasa Group, pharmaceutical care consultants, in Ringwood, N.J.

“A major challenge facing consultant pharmacists is low reimbursement rates,” Sacco says. Consultant pharmacists bill nursing facilities for their services, generally at a rate of $7 to $8 per patient per month, she adds. “If we document that we can save health care dollars by saving nursing hours, that data can be used as a negotiating tool,” she explains. The project shows that cost savings can be achieved, and it calls for an expanded role for consultant pharmacists.

The project started in 1995 when the ACSP board of directors began evaluating the effect of consultant pharmacist-provided services on outcomes, utilization, and overall costs in long-term care facilities, Cameron says. Phase one of the project began with a two-year pharmacoeconomic study quantifying the cost of medication-related problems in nursing facilities and the value of consultant pharmacist services.

The principal investigator for phase one was J. Lyle Bootman, PhD, a professor with the Center for Pharmaceutical Economics at the University of Arizona, and dean of the university’s school of pharmacy, in Tucson. Bootman concluded that the estimated cost of drug-related morbidity and mortality in long-term care facilities was $4 billion, compared with $7.6 billion without consultant pharmacist services.

“While some studies have looked at different aspects of cost savings achieved by consultant pharmacy services, primarily reduction of drug utilization, the Fleetwood project is the first to use a comprehensive approach to examine patient outcomes and the cost of drug-related problems,” Bootman says.

Optimal therapeutic outcomes in relation to pharmaceutical services in long-term care settings are defined in the Bootman study as providing “the right drug, for the right patient, at the right time...with the absence of drug-related problems (DRPs).” Use of consultant pharmacists in long-term care facilities reduces DRPs by 43%, researchers say.

“Consultant pharmacists can prevent some of these problems and reduce costs if they can prevent unnecessary medication use, give better treatment to patients with diabetes, adjust dosages appropriately, and lower noncompliance so that appropriate outcomes occur,” Bootman says.

Minimizing Risk

The second phase of the Fleetwood project began in 1997. Its intent was to develop a new model of DRP that emphasizes prospective review and screening for nursing facility residents at greatest risk for DRPs, and to
compare the new model with retrospective review in terms of outcome measures and costs, Cameron says. Phase two ended last year.

The first part of Fleetwood phase two involved identifying factors that place frail, elderly nursing facility residents at high risk for medication-related problems. The foundation gave a grant to Joseph Hanlon, PharmD, a researcher at the Center for the Study of Aging and Human Development, at Duke University Medical Center, Durham, N.C., to develop risk-screening criteria.

Identifying Risk Factors

Hanlon and fellow researchers conducted a literature review to identify 33 risk factors for elderly nursing home residents. They choose 18 of those factors and reviewed medical records at three North Carolina nursing homes. A review of the records determined the most prevalent medications and medication classes creating risk are anticholinergics, narcotic analgesics, and digoxin.

In the second part of phase two, researchers developed and tested a pharmaceutical model of care that mitigates risk and reduces DRPs. The purpose of the treatment model, known as the Fleetwood model, is to provide “the appropriate monitoring of drug treatment before medications are disbursed, instead of waiting until after the fact,” Cameron says. “Progressive review can help to make certain that the drugs being dispensed are appropriate, effective, and safe.”

The Fleetwood Project Technical Advisory Group (TAG)—composed of representatives from consulting pharmacy practices, geriatric medicine, geriatric pharmacy, nursing, and health economics—began meeting in 1997 to develop the treatment model.

The project allows pharmacists to reengineer their practices and reduce medication-related problems.

“Prior to implementation of the Fleetwood model, pharmacy staff had difficulty conceiving that the pharmacy could be reengineered,” says Sandra Brownstein, PharmD, president of SeniorCare Strategies, consultants in Tucson, Ariz., and an author of the phase two study. “The staff most challenged by the changes were the employees who had been in the pharmacy business the longest. They were accustomed to doing business a certain way and had not questioned the way things were done in quite some time.”

The Fleetwood TAG identified basic assumptions about consultant pharmacy services that needed to be addressed in order to develop a functional, progressive treatment model. According to the phase two study:

1. Transaction-related payment for pharmacist services is unlikely. Believing that payment for transaction-related pharmacist services is unlikely, researchers say payment will occur only when consultant pharmacists can demonstrate substantial cost savings or cost avoidance.

2. Targeting patients at highest risk for medication-related problems achieves the most benefit. By focusing on patients at highest risk for medication-related problems that result in the most costly negative outcomes, pharmacists can concentrate on patients with the greatest need.

3. Interventions must be prospective rather than retrospective. Physicians are more likely to accept pharmacists’ recommendations if the recommendations are made before therapy is initiated, TAG says.

4. Pharmacists must communicate directly with the prescriber. An intervention is more effective if pharmacists communicate directly with the physicians, rather than communicate through a nurse.

5. Interventions must include patient assessment and a formal pharmaceutical care plan. Assessment of patients by consultant pharmacists provides an opportunity to gather information that might not be found in medical records and to monitor any changes in patient status.

6. Treatment must focus on the most costly negative outcomes.

The assumptions about consultant pharmacy led to the development of the Fleetwood model, which has six elements: prospective review for high-risk patients, direct communication with prescribers, a pharmaceutical care plan, patient assessment, morning review of high-risk patients, and weekly clinical rounds.

“The Fleetwood model provides a framework for pharmacists to reengineer their practice and to play a more proactive role in reducing the enormous burden of medication-related problems,” Webster explains. “Phase two showed that the implementation of this model is feasible and results in practical and critical changes in pharmacy practice. Wide-scale implementation of the Fleetwood model in phase three is particularly important as the population ages, the number of people at risk for medication-related morbidity and mortality increases, and consultant pharmacists expand their practice into the broader senior care market.”

—Reported and written by Martin Sipkoff, in Gettysburg, Pa. More information on long-term care strategies is available on our Web site (at www.qualityindicator.com).
Pharmacists Should Play Larger Role in Pain Management, Experts Say

Pharmacists can and should play a vital role in the management of chronic and acute pain, pain experts say. Their familiarity with the relief potential of specific medications, their ability to facilitate communication between patients and physicians, and their educated participation in treatment modalities for dying patients mean pharmacists are highly valued in facilitating pain relief, says Bruce S. Bond, RPh, a pharmacist and pain management consultant with Owen Healthcare Inc., a hospital pharmacy services provider in Houston.

“Pharmacists are unique in their ability to provide cost-effective therapy through their expertise in pharmacology, understanding of disease states, knowledge of available forms of dosage and of the different costs associated with each, and experience in good business practices,” Bond says. “These factors give pharmacists an opportunity to provide pharmaceutical care to patients in pain. No other discipline has all of these capabilities, which are essential to cost-effective therapy.”

A Team Approach

Pain management teams in health care facilities—including nursing homes, clinics, and hospitals—usually consist of physicians, nurses, physical and occupational therapists, psychologists, social workers, nursing assistants, and pharmacists. Pharmacists dispense medication, collect and evaluate information on pharmacotherapy for pain, and can formulate courses of action for individual patients, says Michael Ashburn, MD, medical director of the pain management center at the University of Utah Health Sciences Center, in Salt Lake City, and a former president of the American Pain Society, in Glenview, Ill.

“By being aware of a patient’s current prescriptions and medical history, the pharmacist can identify potential drug interactions and other problems associated with concomitant medication,” Ashburn says. “In addition, the pharmacist may inform other team members of newly available therapies, alternative therapies, and the most cost-effective approaches for managing a particular case.”

Pharmacists also have a rule in helping patients cope with pain and helping patient’s families understand the issues involved in pain treatment. Studies show that in addition to inadequate prescribing, patient and family concerns about drug addiction and side effects hamper the patient’s willingness to take medication to control pain even when it is prescribed, says John C. Meyers, PharmD, a pharmacy department administrator at the Oregon Health & Sciences University, in Portland. “Pharmacists who educate themselves on pain management and communicate their understanding of the issues involved to the patient, members of the patient’s family, and health care profession-als will help greatly in reducing barriers to pain relief, especially for the dying,” he says.

Pharmacists have a unique opportunity to provide pharmaceutical care to patients in pain, and this capability is essential to cost-effective therapy.

In hospitals, pharmacists are involved in decisions involving pharmacy and therapeutics and formulary management, making their participation in pain management highly useful, Bond says. “What health care providers don’t do enough is clinical intervention through the use of pharmaceutical care,” Bond says. “It is not hard to decide which drug to use, since there are numerous algorithms, printed protocols, and other resources to assist in the decision; but there are also several ways to accomplish a goal that involve a variety of costs and treatments without affecting quality of care. Pharmacists, with their knowledge of medications and drug delivery systems, can provide this care in the field of pain management.”

The Consultant’s Role

Consulting pharmacists working in long-term care facilities have an especially important role to play in pain management. The American Geriatric Society (AGS), a research (Continued on page 9)
and advocacy organization in New York, estimates that 50% of seniors living independently suffer from chronic pain, and that between 45% and 80% of frail seniors in long-term care facilities are in pain, most commonly from osteoarthritis. As much as 71% of the nursing home population has pain complaints, AGS says, 34% report continuous pain, and 51% report daily pain, but only 15% of all patients reporting pain had been treated for it in the preceding 24 hours. And the incidence of pain in individuals over age 60 is twice that of those under age 60.

Broadening the pain treatment team concept in long-term care facilities to include consulting pharmacists makes good sense from a medical management perspective, says Kathleen Cameron, executive director of the Research and Education Foundation of the American Society of Consultant Pharmacists, in Alexandria, Va.

Regardless of treatment setting, facilitating communication between physicians and patients is a key contribution that pharmacists make regardless of treatment setting. Regardless of treatment setting, facilitating communication between physicians and patients is a key contribution that pharmacists make in all aspects of pain management, including the adequate treatment of chronic pain, Meyers says. “We deal with the needs of one patient at a time,” he says. “And since we deal exclusively with treating the needs of the individual, our success as providers of pain management therapy depends on knowing what works for each person in pain.”

One factor of pain management common across all sites of health care delivery is failure to recognize the degree of pain patients experience, says Sharon E. Melberg, RN, assistant director of hospital and clinics for general nursing services at the University of California Davis Medical Center, in Sacramento.

“Physicians commonly believe they are doing a good job of managing their patients’ pain, though the patients themselves often report significant discomfort,” Melberg says.

The pharmacist should play a role in dispelling myths about pain management, Bond asserts. “These myths, still prevalent today, become barriers to providing proper care to patients,” he says. “It does no good to recommend a dosage to a physician who believes the dose is too high and won’t prescribe it or the nurse who won’t administer it, or worse, if the patient, out of ignorance and fear, refuses to take it.”

Myths surrounding pain management include the misconceptions that clinicians should wait until the patient is near death before starting morphine or that opiates cause addiction whenever they are used, Bond says. Addiction is common among recreational drug users but not among patients who are in real pain from malignancy, he says.

Raising Awareness
Others who hold misconceptions about pain management include the patients themselves and family members concerned about drug addiction and side effects. Such ideas can hamper patients’ willingness to take medication to control pain even when it is prescribed, Meyers says.

Misconceptions among older patients about pain treatment are common, and include erroneous and dangerous ideas. Many believe chronic pain means that death is approaching. Others think that opioid therapy creates geriatric addicts, that pain is normal when aging, that pain is punishment for life’s sins, or that pain today promises redemption tomorrow.

Sometimes, fallacies among patients are coupled with the erroneous ideas of members of the medical team, says Harlan Martin, RPh, a pharmacist with the PharmaCare Management Services Inc., a pharmacy benefits management company, in Lincoln, R.I. Such misconceptions include the assumption that elderly patients, especially the cognitively impaired, endure pain more easily than younger people, that pain complaints are attention-seeking ploys, that chronic pain is inevitable as one ages, and that long-term opioid therapy invites regulatory sanctions.

Pharmacists play a role in helping to disabuse patients and providers of these notions. Also, pharmacists can help to alleviate fear among patients, experts say. The presence of moderate-to-severe pain in terminally ill patients, for example, may not be due so much to undertreatment as it is to the patients’ fear of addiction and their distaste for opioid side effects, fears a pharmacist can help alleviate, says Ezekiel J. Emanuel, MD, chief of the Department of Clinical Bioethics at the National Institutes of Health, Bethesda, Md., who has studied pain and the elderly.

Fewer than one third of patients with moderate or severe pain report a desire to increase pain treatment and about one in 10 patients who experience pain reduce or stop taking treatment altogether, Emanuel says.

In all aspects of pain management, facilitating communication between physicians and patients is a key contribution that pharmacists make regardless of treatment setting.
Palliative Care

In addition to helping to alleviate their fear, pharmacists working with patients who are in pain can use palliative care, which is treatment meant to relieve or lessen pain without curing a disease, such as cancer, says Meyers. “Palliative care implies a treatment goal of making the patient comfortable, not curing the disease,” says Meyers. “While the transition to palliative care is defined and accepted to a greater degree in oncology and in the treatment of AIDS, it is also appropriate in most chronic diseases near the end of life.”

The transition to palliative care is a critical medical decision, Meyers says. Such transitions usually occur throughout the treatment of long-term illnesses, such as cancer. “Initially, the treatment goal is to cure the cancer or to secure a long-term remission,” he says. “If the cancer recurs, the goal may be to put the cancer back into remission, knowing that a cure is unlikely. As the process continues, there may come a point where significant remission is unlikely and the quality of the patient’s remaining life is adversely affected by additional cancer treatment. At this juncture a move to palliative care should be considered.”

With palliative care, a physician will set an attainable treatment goal to ensure that the patient is comfortable. “Although physicians, patients, and the family may feel that nothing else can be done, palliative care can be provided, which, at this point, may be the most important treatment for the patient,” Meyers explains. “During active treatment, the disease may be battled aggressively, with the hope of cure or significant remission taking precedence. In palliative medicine, however, the entire focus is on the comfort of the patient.”

Caregivers should be urged to follow existing guidelines concerning the pharmacologic treatment of severe pain, emphasizing the importance of opioid use in palliative care, Ashburn says. Often, the concerns of patients and caregivers regarding opioid use are groundless, experts say.

“The active involvement of pharmacists in the care of patients near the end of life may lead to more appropriate use of opioids and NSAIDs and reduction in adverse side effects associated with analgesics. Also, pharmacists can help patients and health care providers become better informed about the medications in use,” Ashburn says.

The World Health Organization’s International Agency for Research on Cancer, in New York, reports that 50% to 80% of cancer patients do not receive adequate pain control. Because studies have shown that cancer pain is largely not controlled, the Agency for Healthcare Research and Quality (AHRQ), in Rockville, Md., has studied pain management methods. A panel of more than 470 health care professionals and 70 patients participated in the development and evaluation of clinical guidelines for effective pain management. The guidelines have been published in Management of Cancer Pain (Clinical Practice Guideline Number Nine) and are available from AHRQ’s Web site (at www.ahrq.gov).

“Cancer pain can be managed effectively through relatively simple means in as many as 90% of the 8 million Americans who have cancer or a history of cancer,” AHRQ says. “Unfortunately, pain associated with cancer is frequently undertreated. Although cancer pain or associated symptoms cannot always be entirely eliminated, appropriate use of available therapies can effectively relieve pain in the great majority of patients. Pain management extends beyond pain relief to encompass the patient’s quality of life. As patients vary in diagnoses, stages of disease, responses to pain and interventions, and personal preferences, so must pain management.”

By providing information to physicians and patients on the proper and timely use of medications, pharmacists can contribute to the wellness and longevity of those in pain. “Pain kills because of the physiological events, because it becomes too difficult to bear the pain, and because a patient gives up,” Melberg says. “Proper pain management saves lives.”

—Reported and written by Martin Sipkoff, in Gettysburg, Pa. More information on disease management strategies is available on our Web site (at www.qualityindicator.com).
Implementing CPOE Presents Challenges

Putting a computerized prescriber order entry (CPOE) system into place is a complicated process, says Neil Davis, PharmD, co-founder of the Institute for Safe Medication Practices, a research organization in Huntingdon Valley, Pa. To be successful, the process requires strong and continuous support from administrators. Among the first challenges the planners must address are questions about patient privacy and access to medical records.

In addition, any hospital or health system planning for a CPOE system needs to design a system that accommodates both inpatients and outpatients and can be used across the continuum of care, including preventive, hospital, clinic, home, and hospice care, ISMP says.

Administrators should consider only systems that are physician friendly. To foster physician use of the new systems, hospitals and health systems should select physicians for the planning committee who are respected by their colleagues and who are actively involved in writing orders.

Before the new system is installed, administrators need to determine which drug allergies and drug-drug interactions are significant enough to be presented electronically to physicians. Overloading physicians with clinically insignificant alerts could mean they would ignore the alerts. To make the system easier to use, administrators should establish cross-departmental consistency in pathways, and plan for wireless terminals.

Among the problems administrators will encounter are that even though paperless systems may be the long-term goal, initially more paper will be generated, necessitating more high-speed printers and paper shredders.

Procedures that are in place for manual systems will need to be adapted for computer systems.

When the system is used for the first time, it is best to have expert users available 24 hours a day on nursing units. And, finally, administrators need to understand that human error will exist even with a computer system and that pharmacists will still need to review physicians’ orders.

Pressure From Buyers

Hospitals are facing pressure from corporations that buy health benefits for employees to begin using CPOE systems in their facilities, says Donald Nielsen, senior vice president at the American Hospital Association, in Chicago. “Purchasers are beginning to use their buying power to try to compel hospitals to purchase CPOE systems,” Nielsen adds.

About 70 Fortune 500 companies affiliated with the Business Roundtable, in Washington, D.C., have established a consortium called the Leapfrog Group, which promotes quality initiatives in health care purchasing decisions and advocates the use of CPOE in health care systems. “The widespread implementation of CPOE is a major step in reducing medication errors,” says Suzanne Delbanco, executive director of the Leapfrog Group.

Some states are considering laws requiring health systems to implement CPOE systems. Already, California law calls for all urban hospitals to have plans by next year to implement CPOE systems by 2005.

The Medication Errors Reduction Act, introduced in the U.S. Senate in May, would provide just under $1 billion over the next decade to help health facilities pay for new technologies to decrease medication errors. It authorizes $97.5 million per year for 10 years for grants to hospitals and skilled nursing facilities to purchase or lease new computerized medication-tracking systems, to improve existing technology, and to provide education and training for staff. Systems funded under the grants would include automated prescribing programs that intercept errors when drugs are prescribed, electronic medical record systems, automated pharmacy dispensing systems, and programs that verify the accuracy of prescriptions at the patient’s bedside.

Multidisciplinary Teams

Experts endorse the use of CPOE because it addresses errors in all four components of the medication-use cycle: prescribing, dispensing, administration, and monitoring. Administrators in hospitals installing such systems should recognize that each element of the cycle is associated with preventable medication-related errors, and that such systems should be...
designed to assess and correct errors in all four areas, Lombardi says. What’s more, all error reduction efforts should include all members of a health care team, he says.

The Joint Commission of Accreditation of Healthcare Organizations, a hospital-accrediting agency in Oak Brook Terrace, Ill., includes in its standards for assessing health care systems the stipulation that multidisciplinary teams should be involved in assessing medication use, including all professionals who are primarily responsible for each of the components of the medication cycle: physicians for assessment of prescribing, pharmacists for dispensing, and nurses for administration.

Professionals who focus on patient education, representatives from health system administration who provide financial and administrative support, and others involved with the components of the medication-use cycle (such as respiratory therapists and representatives from laboratory services) also should be involved, Lombardi says.

**Administration Errors**

All efforts to reduce medication errors should begin by addressing administration errors, according to U.S. Pharmacopeia, a nonprofit organization in Rockville, Md., that collects data on medication errors in hospitals. Administration errors are the leading cause of medication-related preventable adverse drug events, accounting for 40% of all medication errors, researchers say in a report published by U.S. Pharmacopeia in December.

MedMARx is the USP anonymous medication error-reporting database. In 1999—its first year of operating MedMARx—USP collected data on 6,224 medication errors from 56 hospitals. The vast majority of the errors were not harmful to patients, even though more than two thirds were not intercepted before the patient took the medication. But 3% caused temporary or permanent impairment requiring intervention, and some were life-threatening or fatal, says Roger L. Williams, MD, USP executive vice president and CEO.

“The problem is that these numbers show just the tip of the iceberg,” Williams says. The data reflect voluntary reporting from only about 1% of all U.S. hospitals. Data from a larger group of hospitals likely would support the findings from a 1999 report by the Institute of Medicine on medication errors, he says.

Real-time data allow more accurate prescribing, dispensing, and administration.

“But regardless of the overall statistics, any level of error is intolerable and should lead to a search for systemic solutions,” Williams says. Currently, about 300 hospitals participate in MedMARx. “These hospitals are committed to changing the way they think about medication errors, from the collection of data, to the analysis of data, to the outcomes they expect,” Williams says.

Using MedMARx data, USP examined the causes of medication errors and concluded that human error contributed significantly. USP also said that insulin and anticoagulants were the drugs most likely to be involved in an error. Omission, improper dosage, and unauthorized drugs were the three most frequently reported types of errors, and performance deficits, failure to follow procedures or protocols, and knowledge deficits were the most frequent causes identified. Other factors contributing to errors included distractions, workload, and inexperience and illegible handwriting or problems with drug distribution systems. In almost a third of the cases in which a hospital reported taking action to address a medication error, the personnel who committed the error were not informed of their role, reducing the chances that these professionals could learn from their mistakes.

One way to minimize human error is with training, retraining, and competency programs designed to ensure that all staff are aware of procedures and protocols implemented to minimize errors, Williams says. But human error can never be eliminated. Therefore, hospitals and health systems are beginning to rely on systems that provide bar-code scanning, CPOE, and other technologies, he explains.

Hospitals using effective CPOE technology, for example, will find that some of these systems facilitate direct communication between physicians and hospital pharmacists, says Neil Davis, PharmD, co-founder of the Institute for Safe Medication Practices, a research group in Huntingdon Valley, Pa.

“The time will never be better for pharmacists to establish systems that further the rational and safe use of medication,” Davis says. “Never before have physicians, nurses, the media, the government, and the public been so well informed and so supportive. Pharmacists should actively fight for bar coding, physician computer order entry, pharmacists’ clinical involvement, and anything else that is needed to reduce errors.”

—Reported and written by Martin Sipkoff, in Gettysburg, Pa. More information on pharmacy management strategies is available on our Web site (at www.qualityindicator.com).
Recently, AdvancePCS sponsored a pilot project to determine whether handheld organizer technology providing drug reference and formulary information can help physicians improve the efficiency of their practices. Can you describe this project for us?

H: The pilot project was developed in cooperation with ePocrates Inc., a company in San Carlos, Calif., that has one of the largest networks of physicians using a handheld computer. The network includes more than 100,000 physicians and 120,000 medical students and other health care professionals. The pilot entailed the use of ePocrates’ qRx software by more than 100 physicians working with patients of ConnectiCare Inc., a large health plan in Farmington, Conn. This software provides drug reference and formulary information on Palm Vx handheld devices. The technology provided the physicians with instant access to dosing and interaction facts on 99% of the most commonly prescribed drugs, right at the point of care.

To ensure that the software was usable by the physicians, we loaded formulary information not only for AdvancePCS health plan clients, but for all of the major health plans in ConnectiCare’s geographic location. We understood that the physicians needed the device to work for all the patients coming to see them. That factor was key in ensuring that the pilot provided adequate and meaningful data.

Q: What were the findings from the project?

H: More than 80% of the 100 participating physicians said the pilot program was valuable or very valuable. Physicians reported that the technology allowed them to improve quality of care, manage drug costs, reduce workflow inefficiencies, and make better prescribing decisions for their patients.

The pilot showed that time-saving access to health plan formularies simplified one of the most difficult tasks in a doctor’s practice, selecting drugs covered by health plans. As a result, the number of pharmacy phone calls to physicians to clarify or revise prescriptions was reduced. Participating physicians also reported that the technology improved quality of care, since it increased prescription accuracy. Finally, three quarters of the physicians said that the technology influenced their choice of prescription medications such that they prescribed more cost-effective drugs while maintaining clinical appropriateness.

Q: Do you believe that these findings could be replicated in a larger physician population?

H: Yes. Because of the obvious benefits that result from e-prescribing systems, pharmacy directors in managed care organizations should be rolling out this technology as fast as they can.

But even given the tremendous advantages of using this type of technology, we acknowledge that it is not for everybody. Given their different personalities and work styles, physicians are going to accept new technologies with varying levels of enthusiasm. Managed care organizations should identify the physicians who

(Continued on page 14)
are prepared and excited to adopt new technology. Over time, their number will grow, especially since the physician population is becoming younger.

**Q:** What is your RxHub initiative, and how will it foster the use of technology that facilitates prescribing?

**H:** The ConnectiCare pilot showed the benefits that can be achieved through physician access to formulary information. But the significant challenge is to develop handheld technologies that can communicate with the computer systems in PBMs. The RxHub initiative is targeted at that particular problem.

RxHub is a joint venture founded by AdvancePCS; Merck-Medco, in Franklin Lakes, N.J.; and Express Scripts, in St. Louis, the three largest PBMs in the country. Each of the three companies had been working on electronic prescribing initiatives, and independently recognized the need for a standardized system that would verify patient eligibility and drug benefit information across PBMs, pharmacies, health plans, and providers. In addition, we all recognized the value in creating a connectivity hub, through which electronic communications—including prescriptions—could be transmitted among these constituencies.

Accordingly, through RxHub, we will develop specifications that will allow us to transmit data in a uniform manner so that each individual vendor of point-of-care systems or physician practice management systems does not have to create separate interfaces to connect to each individual PB. RxHub will reduce the need for handwritten prescriptions by providing a means for physicians to route prescriptions to the pharmacy electronically, regardless of the patient’s health plan or pharmacy.

It is important to note that RxHub will not fundamentally change the way medicines are prescribed, since physicians will still select the drug and the role and responsibilities that pharmacists currently have will remain the same. RxHub will not affect the patient’s choice of pharmacy, be it retail or mail-service, other than to confirm whether or not the pharmacy is participating in the patient’s health plan. Rather, RxHub will make the process of prescription writing and dispensing more efficient. It will also increase patient safety and convenience and reduce costs.

**Q:** Will physicians and pharmacies be receptive to this idea?

**H:** More physicians are considering the use of electronic prescribing technology in their practices. Currently, more than 50 such electronic prescription-writing platforms exist, either in handheld or PC-based forms. However, broad adoption by physicians is unlikely until they have a single, standardized link with all participating PBMs, health plans, and pharmacies to identify patient benefit coverage and eligibility.

**Q:** Our readers are concerned about balancing their service to patients and their workload. They hope that new technological solutions will help them spend more time with patients. Do you envision that benefit arising from RxHub?

**H:** Absolutely. RxHub is designed to create a conduit that allows physicians to transmit prescriptions that are less prone to prescribing errors associated with handwriting recognition, sound-alike drugs, and other problems. RxHub also will remove some of the administrative hassle from the system for both physicians and pharmacists by reducing or eliminating the need for interaction regarding prescription changes or patient eligibility issues.

The benefits to the patient are significant as well. When something goes wrong with a prescription, it’s a service failure and the patients do not get the kind of service they want from that pharmacy. By providing the pharmacist with better information, RxHub can go a long way toward improving patient safety, patient compliance, and overall patient satisfaction with their pharmacy. In addition, RxHub can facilitate the prescribing process so that the pharmacist can spend more time counseling patients.

**Q:** How will RxHub facilitate cost-effective care?

**H:** The ConnectiCare pilot results indicated that three quarters of the participating physicians found that easily accessible formulary information allowed them to favor more cost-effective drugs. Providing formulary information at the point of care may sound simplistic, but it is really the first step in a true e-prescribing solution. We found that when physicians have an easy way to know what drugs are covered, what drugs are preferred, and what different drugs costs, they will—if all things are equal in terms of quality—prescribe lower cost medications.

RxHub will facilitate cost-effective care in the same way, but it moves well beyond the formulary drug reference information that we provided in the ConnectiCare pilot. It will incorporate drug utilization review checks
“This system provides a financial incentive for the patient and starts to introduce economic decisionmaking into the prescribing process, without compromising the physician’s ability to prescribe the most clinically appropriate drug.”

—Jeff Jackson, AdvancePCS

H: We are abiding by all NCPDP standards created to date, with some modifications. However, we would like any modifications we make to be reviewed by NCPDP and hope that it will fully endorse our final specifications.

J: As our work has progressed through various committees and project teams, we have moved beyond NCPDP standards only in places where NCPDP has not established standards for some electronic prescribing transactions on which we are focused. Hopefully, we’ll be able to take the work of RxHub back to NCPDP so that it can be incorporated into the council’s standards. In all other areas, we are adhering to the NCPDP standards. In general, RxHub does not want to become a standard-setting body.

Q: What role will other PBMs play in RxHub?

H: While we have intentionally limited the number of RxHub founders to facilitate decisionmaking on the project, we have contacted a large number of other PBMs and asked them if they had an interest in participating as subscribers. Without exception, they have all said yes. RxHub will be an open utility in which all PBMs will be allowed to participate. However, we will have a user alliance that will allow all participants to steer the strategy of RxHub and the future of the standards.

Q: How will RxHub incorporate the work of the National Council for Prescription Drug Programs, the industry’s standard setting organization?

H: As our work has progressed, the founders have tried to narrow the scope and remain very focused only on electronic prescribing. We’ve eliminated distractions and avoided any ancillary services that would represent an increase in the scope of RxHub’s mission. Basically, we’re focused only on the electronic routing of prescriptions between physicians and pharmacies and improving the quality of those prescriptions. By keeping a tight rein on our mission, RxHub will be successful.

Q: Do you expect a political struggle, given that the RxHub founders are competitors?

H: None of us currently has this technology, so there will not be a political struggle over what system to choose. However, the RxHub CEO will obviously need to negotiate the normal political struggles CEOs typically have with board members. Of course, the fact that the consortium members are competitors will likely increase that complexity.

Q: Will there be fees associated with participating in RxHub?

H: RxHub will not require a fee from physicians, since physicians will access RxHub through participating technology companies. Subscribers, such as PBMs, health plans, technology companies, and pharmacies, each will have fees associated with the transmission of information between them and RxHub.

Q: What is the status of the RxHub effort?

H: RxHub should be in use sometime in 2002. We are trying to ensure that RxHub will be discrete from any of the three founders. For example, we are in the process of hiring a management team that can build this technology independent of the founders and then sell it as an industry utility.

Q: Can drug costs incurred by consumers be reduced as well?

H: Yes. Often drug plans have two or three cost tiers, in which there are different co-payment structures for each tier. By accessing formulary information that indicates the costs of various drugs, physicians can forgo prescribing Drug A, a nonpreferred drug with a $25 co-pay, in favor of an equally appropriate Drug B, a preferred drug with only a $15 co-pay. Physicians can also check whether less expensive generic alternatives to brand-name drugs are available.

This system provides a financial incentive for the patient and starts to introduce economic decisionmaking into the prescribing process, without compromising the physician’s ability to prescribe the most clinically appropriate drug.
One managed care company in Ohio has bucked the trend, however, and for five years has been paying its pharmacists to provide cognitive services. “Pharmacists play a positive role in improving the health and well-being of our members,” says Bruce Sill, director of pharmacy services for the Ohio State University Managed Health Care System in Columbus, the health plan for the employees of Ohio State University and their families.

The OSU health plan is successful for several reasons, says Marialice Bennett, RPh, a professor in the school’s College of Pharmacy and a director of the Pharmaceutical Care Clinic. “The university is self-insured, which helps make our cognitive services program possible,” Bennett explains. “Our programs have the benefit of being provided within a patient population that is generally nontransient and therefore comparatively easy to monitor. Long-term costs become more important when you have many long-term employees. It also is easier to establish ongoing counseling relationships.”

The OSU plan has about 40,000 members, about three-fourths enrolled in the plan’s HMO. The remainder are enrolled in one of two indemnity plans or a PPO. In its clinical partners program, the plan pays pharmacists at the OSU Pharmaceutical Care Clinic $1 per minute for providing consulting and other services in two programs: a disease management program called Clinical Partners and a cholesterol management service. The plan also pays pharmacists a flat fee to enroll patients in a smoking cessation program and for conduct a wellness program. The clinic bills the OSU health plan monthly on a fee-for-service basis.

Clinical Partners

The purpose of the clinical partners program is to assist patients and referring physicians in the proper use of medications, Bennett explains. To access the services of a qualified pharmacist, a patient would make an appointment and a pharmacist would do an initial assessment of the patient’s health status. Then, the pharmacist would develop a plan of care or refer the patient for a blood test or other diagnostic procedures. The pharmacist also would develop patient- and disease-specific educational strategies and start regular outcomes monitoring. The pharmacist also may arrange for interventions such as telephone calls when needed and regular feedback to the...