Study Shows How Pharmacists on Rounds Can Help Prevent Medication Errors

Medical injury from pharmaceutical therapies affects as many as one million patients per year and kills as many as 200,000, according to recent studies. Most adverse drug events (ADEs) occur in hospitals and as many as two-thirds of hospital ADEs are preventable, according to a report this year by the federal General Accounting Office (GAO).

“Health care is a huge industry, and injury is its number one problem,” says Lucian Leape, M.D., a pediatrician and professor of health policy at the Harvard School of Public Health in Boston who has written extensively about medical errors. “There’s an incredibly long way to go to finding ways to combat medical errors, even though errors in the use of drugs have been the subject of many studies published in the pharmacy, nursing, and medical literature over the past several decades.”

Human Error

Many ADEs are caused by reactions to specific drugs, even when drugs are prescribed correctly. Such ADEs are known as adverse drug reactions (ADRs) and most are not preventable. But a substantial number of ADEs occur as a result of human error, health care experts say. Either a patient is given the wrong dose, the wrong drug, or a drug is administered to the wrong patient.

A analysis of health care data shows that nearly half of ADEs are the result of avoidable error, the GAO report says. Many of these errors result from illegible prescriptions, a problem that could be largely alleviated by using computerized prescription processes and greater involvement of pharmacists in the treatment process, says Janet Heinrich, the GAO’s associate director for health financing and public health issues.

Two steps could be taken to reduce preventable ADEs in hospitals, the GAO and other health care experts say: automate prescription data and actively involve pharmacists on medical rounds, including those in intensive care units.

“Most medication errors in hospitals involve prescription orders and the administration of drugs,” Heinrich says. “Pharmacists make relatively few medication errors when they transcribe, verify, and dispense hospital prescriptions.”

“Human beings make mistakes,” says Leape. “But human errors are often caused by system failures, or characteristics of the workplace that make errors more likely and more difficult to detect and correct before an accident occurs. It seems reasonable that medical injuries also may result from system failures. But this idea of system failures as the root cause of errors has not been widely accepted in medicine.

“The medical model is to expect perfection and to punish an individual when errors occur,” Leape continues. “But the most effective way to reduce the likelihood of accidents is to change the system as a whole. The assumption is that most of the time, most people are doing their best. Errors are seldom willful. There is usually a

CONTENTS

Editorial
The Compelling Logic of Using PBMs for a Medicare Drug Benefit 2

Information Systems
Hospital Gets Significant Savings From Pharmacy Supply Management Program 3

Pharmaceutical Management
Pharmacists Play Increasing Role in Data Collection for Outcomes and Analysis 6

Interview
CVS Moves to Increase Efficiency by Expanding Its Internet Presence 10

(Continued on page 14)
The Compelling Logic of Using PBMs for a Medicare Drug Benefit

Few policymakers disagree that there is a compelling logic to the idea of adding a prescription drug benefit to the Medicare program. A number of problems arise, however, when policymakers begin to total the cost of adding such a benefit. More important is the issue of how to control the cost.

In his State of the Union address, President Clinton said three of every five senior citizens lack dependable drug coverage and that because they lack the ability to buy in bulk as managed care organizations do, they pay the highest prices for pharmaceuticals. The White House has estimated that a Medicare prescription drug benefit plan would cost $118 billion.

Some observers have proposed that the government could apply private sector best practice techniques to Medicare by using pharmacy benefit managers (PBMs) to administer a drug benefit for seniors. PBMs already administer pharmaceutical benefits for health plans, HMOs, and employers while managing drug utilization and obtaining discounts from retail pharmacies and manufacturers.


PBMs have the requisite experience because they have managed drug benefits for health plans in settings similar to Medicare fee-for-service, the report says. They also have developed effective cost-containment mechanisms by steering utilization toward the most cost-effective therapies, the report says. By negotiating prices on behalf of a large pool of patients, PBMs could pass on savings to Medicare beneficiaries, the report explains. What’s more, PBMs could increase the quality of prescription drug services for Medicare beneficiaries because purchases would be tracked in a comprehensive database, allowing thorough reviews that would help to prevent adverse drug reactions, the report says.

Using PBMs to manage a Medicare drug benefit also has certain limitations, however. The amount of savings that PBMs can achieve would depend largely on how much flexibility the government gives PBMs to apply a broad range of techniques to promote the use of cost-effective drugs. Also, conflicts of interest need to be monitored. A potential conflict of interest arises when a PBM uses formularies to favor one brand-name drug over another based partly on payments received from manufacturers. Usually, independent pharmacy and therapeutics committees resolve such conflicts, but for Medicare, the government would need to establish guidelines for PBM formularies and monitor their use, the report says.

A nother, more difficult problem to solve, may be a backlash from the public against PBMs. The public may reject the methods PBMs would use to promote the use of the most effective therapies, for example. PBMs would likely create a beneficiary co-payment structure that encourages the use of cost-effective drugs where appropriate. Such a structure would mean patients would need to pay more for certain medications, leaving PBMs open to public criticism.

Still PBMs may offer the best solution to what is a difficult problem that needs to be settled: providing a prescription benefit to our nation’s seniors.

Joseph Burns
Editor
The Quality Indicator, Pharmacy Resource
21 Stone Wall Lane
Falmouth MA 02540-2219
508/495-0246
editor@premierhealthcare.com

Eric L. Bergen
Vice President, Ancillary Care Services
United Health Group
Minneapolis

Judith A. Cahill, CEBS
Executive Director
A cademy of Managed Care Pharmacy
Alexandria, Va.

Steven B. Cano, M.S., FA SH P
Director of Pharmacy
Fallon Healthcare System and Saint Vincent Healthcare System

Robert M. Elenbaas, PharmD
Executive Director
American College of Clinical Pharmacy
Kansas City, Mo.

Donna W. H ouell-Smith
Regional Clinical Manager
Humana Healthcare
Louisville, Ky.

Peter Kwock, PharmD
Pharmacy Services Manager
Health Plan of the Redwoods
Santa Rosa, Calif.

Dennis M. Williams, PharmD
Chair-elect American Society of Health-System Pharmacists, Section of Clinical Specialists
Assistant Professor, Division of Pharmacotherapy
University of North Carolina School of Pharmacy
Chapel Hill

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Publisher
Premier Healthcare Resource, Inc.
888/457-8800
E-mail: publisher@premierhealthcare.com
Publishing Address: Premier Healthcare Resource, Inc.
Suite 300, 99 Cherry Hill Road
Parsippany, NJ 07054
The administrators at Elliot Hospital, a 296-bed tertiary care center in Manchester, N.H., wanted to improve the process of moving medications from pharmacy to patients. But in redesigning their internal processes, the hospital administrators were not interested in making an incremental change. They wanted to make a quantum leap in efficiency, says Mike Dupuis, vice president of support services.

The year was 1997, and Elliot Hospital was part of an integrated health network (IHN) called Optima Healthcare in Manchester. In managing the network’s pharmacy, administrators faced myriad challenges and sought solutions from a number of system vendors. They decided to re-engineer pharmacy management processes by using a system called CoSource Integrated Pharmacy Services, a product of McKessonHBOC, in San Francisco.

CoSource is a suite of customizable components that combine McKessonHBOC’s distribution capabilities with its automation and information management technology. McKessonHBOC is a pharmaceutical supply management and health care information technology company.

Disparate Systems

In 1998, the first year after implementing the new system, Optima realized savings of $450,000, far exceeding hospital administrators’ expectations. Savings in excess of $2 million are projected over the course of five years, beginning with the first year of the program’s implementation. Last year, savings were less dramatic because of the breakup of Optima Healthcare, which resulted in the formation of three separate organizations: Elliot Hospital, Catholic Medical Center, and St. Joseph’s Hospital. Nevertheless, the total savings are significant and Elliot Hospital has found that its internal processes have been improved markedly.

CoSource is designed to save money for IHNs by integrating disparate processes and information systems, facilitating work redesign, and reducing pharmaceutical expenses across multiple pharmacies. In the process, it helps reduce medication errors and improve patient outcomes, say officials from McKessonHBOC.

Dupuis concedes that the rewards are long term and go beyond dollars saved. In fact, using CoSource has helped Elliot develop a patient care-focused pharmacy system, a growing trend in pharmacy design. In a patient care-focused pharmacy system, pharmacists do more than simply dispense medications. They can expand their roles to become part of an interdisciplinary health care team and provide direct patient care, such as educating patients on the proper use of medications and confronting with clinicians on dosing and medication use.

Medication errors and ADEs are a major source of risk and increased costs for hospitals and IHNs. An estimated 40% of medication errors are thought to lead to adverse drug events, including death, according to an article, “Prescribing Errors in a Teaching Hospital: A 9-year Experience” in the Archives of Internal Medicine, July 28, 1997, issue 157. The same article says computerized drug-ordering systems can help prevent errors altogether.

Necessary Systems

In a study reported last year, Lucien L. Leape, MD, and colleagues at Harvard University's School of Public Health said the participation of a pharmacist on rounds with the medical team in the ICU affords a significant reduction in the risk of ADEs. The article, “Pharmacist Participation on Physician Rounds and Adverse Drug Events in the Intensive Care Unit,” was published in JAMA, July 21, Vol. 282, Issue 3. Moreover, information and automation technologies applied to pharmacy management, as in industrial processes, reduce human involvement in many tasks, thereby reducing the chance of error.

After one year with the new system, the hospital realized savings of $450,000, a 52% return on investment, far exceeding expectations.

Whether purchasing a commercial system or developing a system of their own, a number of IHNs are investing in systems to

(Continued on page 4)
Having separate unlinked databases results in inefficiencies because dosing, scheduling, and timing are not integrated. For example, a physician might order a dosage changed from two tablets a day to three tablets a day. But because the two systems are not linked, the order may not be relayed to the pharmacist.

CoSource has significantly improved Elliot's pharmacy supply management and patient care processes. For example,
the pharmacy-based MAR database has been merged with the nursing-based patient information profile and this information has been transferred to the robot. The robot eliminates having to print a paper fill list because it can pick, dispense, and sort pharmaceuticals as needed every day. Using barcode technology, scanners in the robot read the codes on the prescriptions and then match the codes with the correct drug and dosage.

The robot then fills the drawers and cassettes so that a pharmacy technician can take them to the patient floors. The cassettes are placed in state-of-the-art medication servers in each patient's room. The servers function much like a convenience store dairy case, in which stocking personnel place noncontrolled medications on a shelf for use as needed. Controlled substances, first doses, and STAT doses are contained in secured, unit-based cabinets, centrally located in the nursing unit.

The unit-based cabinets’ auto-vending capabilities are particularly useful when patients are admitted for 24-hour observation. Under managed care utilization review rules, these patients may be watched for 24 hours to assess if outpatient treatment is warranted. If patients stay longer than 24 hours, it is not unusual for health plans to reimburse the hospital at one-third the usual and customary rate, Rozak says. The unit-based cabinets allow for prompt drug administration, which can be critical in a patient’s first hour in the hospital, and therefore, critical to the patient’s ultimate clinical outcome.

When a nurse begins his or her shift, the nurse can use AcuScan, the wireless, palm-sized scanning device that contains the same up-to-the-minute MAR information as the pharmacy, the robot, and the unit-based cabinet. When dispensing medication, the nurse scans the patient's wristband. As a result, the nursing and pharmacy departments are working from the same information in real-time, helping to ensure that each patient gets the correct drug and dosage at the proper time.

Once the patient is discharged, a paper report is generated using information retrieved from AcuScan, and the report is placed in the patient’s file. In the past, a transcriptionist typed the discharge report, introducing the possibility of errors.

An automated pharmacy supply management system such as CoSource reduces the chance of errors to virtually nil, Rozak says. If a pharmacist, nurse, or other professional repackages a drug, however, then an error can occur, he states.

Two technologies that Elliot does not yet have are electronic medical records and physician order entry, technologies that have been shown to reduce errors, according to an article in JAMA, Vol. 280, No. 15 (1998):1311-1316, “Effect of Computerized Physician Order Entry and a Team Intervention on Prevention of Serious Medication Errors.”

Elliot Hospital was the first of McKesson HBOC’s clients to use CoSource. In fact, it is sharing the system with Catholic Medical Center. Even though both hospitals technically compete in the southern New Hampshire market, they have partnered to share the benefits and the investment in CoSource.

Charles Myers, vice president of professional and scientific affairs of the American Society of Health-System Pharmacists (ASHP), in Bethesda, Md., helps to put Elliot’s experience with CoSource into perspective. While it is difficult to argue with such significant cost savings, the greater benefits may be that technology facilitates pharmacists’ involvement with and accessibility to physicians who are prescribing medication for patients, he says. In addition to automating manual tasks, Myers adds, systems also need to foster information sharing among departments, and be advantageous in helping pharmacists design appropriate medication administration procedures. A national accrediting organization for pharmacy residency and pharmacy technician training programs, the American Society of Health-System Pharmacists does not endorse any specific vendors, Myers says, and there is no Consumer Reports publication that pharmacists can use when assessing new technology.

Therefore, if a system helps to improve patient care and simultaneously cuts costs, then perhaps it’s worth the investment.

— Reported and written by Susan Howell, in Philadelphia.
Pharmacists Play Increasing Role in Data Collection for Outcomes and Analysis

The increasing pressure on health care providers to contain costs while maintaining clinical quality and patient satisfaction has resulted in a need for accurate data collection and analysis. Known as outcomes research, such data collection and analysis enables providers to quantify the value of the health care interventions they provide to patients.

No longer the domain of health care researchers, outcomes research is being conducted in hundreds of settings across the nation. Pharmacists, economists, physicians, nurses, and other providers are collecting and analyzing health care data to measure the effect of certain health care interventions on the cost and quality of care. In particular, pharmacists are gathering information on the effect of interventions they are making, including aggressive medication management, patient education, and patient monitoring. The results of outcomes research can support policy decisions, formulary drug selection, treatment protocols, and other processes within a health care system.

Pharmacists can benefit from outcomes research by collecting the necessary data to prove that their actions have a positive effect on the bottom line of health care organizations. If a pharmacy-based disease management program can prove that it can reduce more expensive health care interventions, it may be able to alter the way a health care payer allocates resources. It would be more logical for a provider to pay a pharmacist $500 for six patient education sessions than to pay more than $1,000 a day for a patient who has an acute attack requiring hospitalization.

Influencing Payers

At one time, pharmacists were not involved in any way in collecting patient outcomes data. But today, the need for data collection at the practice level has intensified. Pharmacists now collect patient history information and a variety of clinical data, such as blood sugar levels for diabetic patients or peak-flow readings for asthmatics. The data also include information on medication compliance and any changes in lifestyle. Some pharmacists are collecting this information on paper and others are using computers to collect and distribute the data electronically. These data are often passed on to referring physicians, managed care plans, or to individual patients.

In the Gladstone Group, in Mount Arlington, N.J., is collecting clinical and financial outcomes data in an attempt to validate the concept of pharmaceutical care and influence third-party payers, such as insurers and health plans, to use pharmacists as disease managers rather than as professionals who simply dispense medications to patients. Gladstone’s innovative disease management effort is called the Patient Empowerment Program (PEP).

Under PEP, the Gladstone Group acts as a third-party billing and management organization. The company enrolls pharmacists across the nation and then negotiates disease management programs with third-party payers including employers and managed care companies. Gladstone charges the payers, pays the pharmacists, and takes a percentage of income to cover administrative costs. The company declined to discuss the details of the percentage or the insurers it is working with, but company offi-
For patients with diabetes, the pharmacists conduct 10 education sessions and are paid $500 per patient. For patients with hypertension, the pharmacists conduct seven education sessions and are paid $350 per patient.

Officials at The Center for Pharmaceutical Outcomes Research (CePOR), at the University of North Carolina School of Pharmacy in Chapel Hill, say cost containment concerns have forced health care managers to depend on the analysis of clinical, economic, and humanistic outcomes to make rational decisions concerning the allocation of scarce resources. In order to know how to use resources most effectively, health care providers need to develop and use a knowledge base that contains details on variations in outcomes of health care delivery.

Enrolling patients in an aggressive asthma disease management program, for example, may not result in a decrease in the number of hospitalizations or physician office visits. The collection of data that show a correlation between participation in a program and the use of health care services enables providers to determine effective clinical pathways. If an expensive pharmacist-driven disease management program fails to reduce unnecessary hospitalizations or physician office visits, the health care organization is likely to abandon the disease management strategy.

The relationship between costs and outcomes provides the key to arriving at efficient solutions to the allocation of limited health care dollars,” says William H. Campbell, PhD, dean of UNC-CH’s School of Pharmacy. “One must not only accurately measure such outcomes, but also attach relative values to them so that decisionmakers may fully understand the costs and consequences of alternative treatment or allocation decisions. Thus, outcomes research must ultimately be based on the value of the outcomes in order to be of maximal usefulness.”

Outcomes research may involve the participation of many different health care providers, including pharmacists, in a variety of practice settings. To date, pharmacists have been reluctant to adopt the concept of data collection and analysis because it adds an additional burden to often-overworked practitioners who see immediate profits filling the maximum number of prescriptions and little profit providing patient care.

But pharmacy associations such as the Academy of Managed Care Pharmacy (AMCP), in Alexandria, Va., and the American Pharmaceutical Association (APhA), in Washington D.C., have endorsed the concept of using pharmacists in outcomes programs. They are urging members to consider the collection of patient data an integral part of their practice regardless of the time or technology constraints they might face. Both organizations see patient care as a means for pharmacists to prove that an intervention changed the financial and clinical outcome of a patient’s care.

AMCP defines outcomes research as “a facet of research that measures results of various medical treatments and/or interventions in patient populations.”

“The process involves identifying, measuring, and evaluating the effects of...”

(Continued on page 8)
care provided to patients," AMCP says. "Examples of some outcomes that can be measured are cure rates for certain diseases, patient functional status, activities of daily living, respiratory function, or the rate of hospital admission or outpatient visits."

In the areas of costs, outcomes, and value, significant gaps exist between current measurement abilities and those needed to supply better information that could be useful to decision-makers, says CePOR’s Campbell. “Much current evaluative research fails to use the full range of methods already available,” Campbell adds. “This implies a need for education and research in both theoretical and methodological directions as well as in more obvious practical applications such as specific treatment assessments.” CePOR is developing methodologies to measure treatment-related health and economic outcomes, Campbell says. The center focuses on economic, health status, and humanistic outcomes related to the use of medication and pharmaceutical services.

CePOR’s objectives are
- To develop and evaluate new tools, instruments, and methods in outcomes research
- To evaluate the effect of treatment

To help pharmacists understand the value of collecting outcomes data, the Academy of Managed Care Pharmacy (AMCP), Alexandria, Va., has developed a list detailing the role pharmacists can assume in outcomes data collection and research. AMCP says the eight steps pharmacists should follow when conducting outcomes research are:

1. Identifying topic areas for outcomes evaluation
2. Evaluating published literature
3. Designing evaluations
4. Analizing and assessing results
5. Identifying and executing intervention strategies
6. Monitoring the results of the strategies
7. Presenting results
8. Repeating the evaluation process

1. Identifying topic areas for outcomes evaluation. Through standard processes, such as drug utilization evaluation, or the tracking of undesirable drug reaction trends, pharmacists are in a pivotal position to identify areas to evaluate, AMCP says. Asthma is a topic area, for example, that could be identified via tracking of medication use trends inconsistent with national treatment guidelines. In addition, asthma might be identified in a population in which emergency room visits for acute attacks are higher than national averages.

2. Evaluating published literature. For pharmacists, reading and using published results from outcomes research studies is similar to using results from any valid, rigorous research, AMCP says. The pharmacist must make a critical assessment of the research methods, limitations, potential for bias, and the validity of the study’s conclusions. A review of the literature would be conducted, for example, to assess current standards of practice and national treatment guidelines for asthma. A literature review also would identify those study strategies that have been successful or unsuccessful for the treatment of asthma and aid in designing the project.

3. Designing evaluations. Special training is required to design valid outcomes evaluation studies and analyze the findings, AMCP says. Individuals who have expertise in this discipline may be familiar with assisting in study design, analysis, and sensitivity testing. Understanding the population served by the health care system is essential to the design process and ensures that the evaluation, results, and correction strategies will be implemented correctly to serve the patient population and the system conducting the evaluation. Evaluation studies for the treatment of asthma, for example, could involve a detailed study of a group’s
strategies on patient outcomes
- To assess the relationship of pharmaceutical care and pharmacotherapy on patient outcomes
- To improve graduate education through the involvement of professional, graduate, and postgraduate students in research projects to develop a cadre of scientists trained in pharmaceutical outcomes research
- To disseminate information of a theoretical and practical nature to health care professionals

The center is one of many university-based research organizations that assists health care providers with outcomes studies. Experience in conducting single-center and multiple-center studies for pharmaceutical manufacturers, contract research organizations, foundations, and the federal government has earned the center a reputation for accurate, timely, and relevant research, Campbell says. These organizations focus on the role of pharmacists as outcomes researchers. For many pharmacists, especially those outside of managed care, this concept may be somewhat foreign.

“The average pharmacist in a Mom-and-Pop pharmacy is not likely to be too savvy when it comes to gathering outcomes data,” says Brian Jensen, RPh, owner of the Medicine Shoppe, in Two Rivers, Wis.

As the role of the pharmacist moves from purely dispensing to providing patient care, more pharmacists will need to gather data to justify billing third-party payers for services, Jensen explains. Many pharmacists already are collecting outcomes data and do not realize it, Jensen adds. “If they are taking blood pressures, documenting the results, and comparing them over time, those are outcomes data,” he says. “It may not be on a large, sophisticated scale but it is data collection that ultimately could lead to improvements in patient care.” Jensen participates in Wisconsin’s Medicaid reimbursement program that enables pharmacists to provide a variety of patient care services including treatment for diabetes, asthma, and hyperlipidemia.

—Reported and written by Jayne Whalley-Hill, in North Potomac, Md.

demographics. In this case, a study for a population of pediatric patients would have a significantly different design and set of validation tools than a study for adult patients. A follow-up questionnaire to pediatric patients must not only be statistically validated, but it must also be written in a manner appropriate for a child, the parents, or guardians in order to elicit accurate information.

4. Analyzing and assessing results. Once the results have been collected, they must be tallied and analyzed by a health care actuary, AMCP says.

5. Identifying and executing intervention strategies. Once the asthma interventions have been in place for a year, for example, assessments should be made to evaluate the outcomes and economic effect on the patients and the health plan. These evaluations might show a change in drug use patterns by asthmatic patients or a change in emergency room visits. In addition, a statistically valid survey might be used to determine changes in patients’ knowledge about asthma and their control of their condition.

7. Presenting results. To ensure continuous improvement in the evaluated therapeutic areas, pharmacists should present results of successful outcomes evaluations to peer organizations, AMCP says. A presentation of the results of the asthma program could be made to the state pharmacists’ organization, for example.

8. Repeating the evaluation process. Repeating the evaluation helps pharmacists to monitor any changes over time.

The pharmacist must make a critical assessment of the research methods, limitations, potential for bias, and the validity of the study’s conclusions.

intervention strategies. Once the study results have been completed, the pharmacist is an integral part of the team of health care professionals who take responsibility for making sure that corrective action is taken, the outcomes are acceptable and within reasonable cost ranges. After the asthma interventions have been in place for a year, for example, assessments should be made to evaluate the outcomes and economic
CVS Moves To Increase Efficiency by Expanding Its Internet Presence

Gayla Waller, RPh, is pharmacy information manager and a clinical pharmacist for CVS.com, in Seattle, a subsidiary of CVS/pharmacy, in Woonsocket, R.I., one of the nation’s largest drugstore chains. In her role at CVS.com, Waller serves as a pharmacist resource for the company, works with strategic partners, potential partners, and oversees pharmacy content development. Prior to joining CVS.com, Waller worked in retail, consulting, and hospital pharmacy settings. She has been active in state and national pharmacy associations since earning her pharmacy degree from Samford University in Birmingham Ala., in 1989. Waller holds licenses in Washington, Virginia, Vermont, and Alabama. Joseph Burns, editor, conducted this interview.

Q: Information systems appear to be a key to future success in health care. Can you discuss how CVS.com is using health care data to improve care that pharmacists provide? CVS has a new, innovative system, for example, that is designed to provide customers with information on the effects of combining prescription medicine with nutritional supplements and nonprescription health remedies including herbal products. Can you discuss how this program will work?

A: At the store level, the pharmacist can enter nutritional supplements and non-prescription health remedies including herbal products the customer is on into the customer’s medication profile. The system then can screen for possible interactions between these products and the prescription medications the customer is on. The pharmacist will then evaluate the results and counsel the customer accordingly.

Also, the pharmacist can print out information for the customer on the vitamins or herbs and the person can get additional counseling from the pharmacist on these products. It’s easy for customers to get overwhelmed with the many products available and advertisements they see for herbal products and vitamins. Therefore, we think it is helpful to our customers for our pharmacists to counsel them, and we are providing our pharmacists with the best resources available to do so.

A follow-up to our store program, we at CVS.com are going to roll out a natural health category on our Web site to offer in-depth information on herbal and nutritional supplements and vitamins. So, that’s another way customers can get information on these products. We also have a tool called “Drug Doublecheck” on our Web site that screens for drug interactions. A patient can type in the names of the drugs he or she is taking and it will alert the patient if there is a potential drug-to-drug or drug-to-food interaction. Also, we plan to enhance that “Drug Doublecheck” tool to include herbas and vitamins.

Our pharmacists already answer questions about herbal and nutritional supplements via e-mail or on the telephone. CVS.com pharmacists are available 24-hours-a-day, 7-days-a-week. We have access to the best services for research if needed in evaluation of these possible interactions or other questions and concerns. We want to increase awareness to the public of the possibility for interactions between prescription medication and other over-the-counter products they take or are considering taking. We hope that if the customer learns of a potential problem with his or her medication regimen, he or she will use this information to initiate a conversation with a physician or pharmacist.

Q: How does it work internally? Is it a matter of sophisticated computer programming?

A: It’s like the software that pharmacists use to fill prescriptions. These programs will raise flags for the pharmacist to show that certain drugs may trigger an interaction or may trigger a drug-to-food interaction or drug-to-disease interaction. Our systems technicians have taken the possible interactions from herbal supplements and made it so that the pharmacists will see flags raised for possible interactions just as they would see flags raised for an interaction involving one or more prescriptions. The pharmacists have wanted this for some time and the major systems vendors have been working on it vigorously for more than a year and are just now getting it to market.

Q: Can you explain how it works? If I’m on a particular medication and I go to a pharmacy to pick up my prescription and then the next day buy an herbal supplement for something else, how does the pharmacist know there may be an adverse reaction? How does the pharmacy know who I am?

A: If somehow bought an over-the-counter product and did not alert the pharmacist, then there would be no way to track that potential interaction. Just like with the current system that we have been using for drug interactions, if a patient is taking an OTC medication for heartburn and doesn’t tell us, we don’t know and can’t enter it into the profile. That’s why we need to educate customers and increase aware-

“We need to educate patients to tell their pharmacist and physician about everything they take so the pharmacist and physician each can update the appropriate medical records and patient profiles.”
“Our pharmacists are not counting pills or putting labels on bottles. Our automated fulfillment technology does all that. It means our pharmacists work in an office-like environment where they are better able to concentrate on what they went to school to do: which is to counsel patients and evaluate drug therapy. They are able to perform their duties as clinical pharmacists by using technology and automation to increase their efficiency.”

Q: In other words, it would behoove patients to buy herbal and nutritional supplements at the same place they get their prescription drugs. A health food store would not have access to the same information that the pharmacy has. Is that right?

A: Since pharmacists already maintain a profile on the patient, including allergies, prescription medications, and diseases, they are in the best position to evaluate for potential interactions with the herbal and nutritional supplements. This is true of pharmacies that don’t have this newest herbal-to-prescription drug technology that CVS has. As a rule, pharmacists have the foundation needed to evaluate how drugs affect the body, how the body affects drugs, and how drugs affect each other.

What’s more, the information that’s available on these issues is increasing. Some of the largest and most trusted information providers to pharmacists are now incorporating information about these alternative therapies so that pharmacists now feel they have reliable sources they can trust on these potential interactions.

Q: It’s interesting what you said about education because so many important issues in pharmaceutical care involve patient education. Do you find that patient education is a significant part of your job and the job of all pharmacists today?

A: Absolutely, and it’s becoming more important as customers take a more active role in their health care. They are craving information and it’s the pharmacist’s responsibility to provide this information.

Q: How do pharmacists fill the great volume of prescriptions they need to fill and still find time to offer counseling to patients?

A: That’s one of the biggest problems that every pharmacy company is facing now given the volume of prescriptions that need to be filled and the shortage of pharmacists. We are currently addressing this problem. At CVS.com, we have a state-of-the-art fulfillment center in West Chester, Ohio. Our pharmacists are not counting pills or putting labels on bottles. Our automated fulfillment technology does all that. It means our pharmacists work in an office-like environment where they are better able to concentrate on what they went to school to do, which is to counsel patients and evaluate drug therapy. They are able to perform their duties as clinical pharmacists by using technology and automation to increase their efficiency.

Pharmacists everywhere are feeling the crunch, and I can tell you that I have worked behind the counter and I know exactly what that crunch feels like. Our industry is aware that something will need to be done to ease the burden on pharmacists.

The CVS/pharmacy customer has more options now to place and receive prescription orders and we are freeing up some of the store pharmacists to focus more on the initial counseling for new prescriptions and other disease management activities they do for customers each day. Customers love the convenience of placing orders over the Internet, further freeing store pharmacist’s time. When you have increased efficiency, everyone wins.

Q: Do you find there is a push to provide a financial incentive to retail pharmacists who take time out from filling prescriptions to counsel patients?

A: There is a movement toward reimbursement for disease management services. It is a good step to acknowledge that the pharmacist is a key player in health care, and can increase cost savings to the health care industry if the industry can use the expertise of pharmacists to counsel patients.

Q: Recently, CVS.com announced a new agreement with one of the largest online providers of information on the Internet, Healtheon/WebMD. What’s the strategy behind this partnership for CVS.com?

A: It’s going to provide our customers with a depth of health care content on the Web that they can readily access to obtain information on pretty much anything that they would like to know about pharmacy, or drugs, or health care. Also, it will give users of the WebMD site direct access to CVS.com for prescriptions, over-the-counter medications, and health and beauty needs.

The back-end technology is also very interesting in this deal. For instance, CVS and Healtheon/WebMD have pledged to develop new products and technologies, including a standard solution for generating and filling prescriptions electronically.

Q: Can you explain how an electronic prescription will work? If I am a consumer and I visit an Internet site that provides answers to patients’ questions about various ailments, and if I interact with a physician by e-mail, and he or she writes a prescription for me, could I get that prescription filled at CVS.com?

A: No, we will not honor a prescription that’s written by a physician who has

(Continued on page 12)
not seen the patient. The patient must have
a legitimate patient-physician relationship.
Then, if the physician wants to write a pre-
scription using his or her desktop or hand-
held computer or whatever, he or she can
do so rather than use a prescription pad.
There has been a lot of media attention on
this topic about how the computer can help
reduce the number of errors related to
handwritten prescriptions. This system will
once it gains a foothold, physicians will
realize significant improvements in effi-
ciency. They will be able simply to walk
over to a PC as soon as they leave the
examining room and enter the prescrip-
tion information. What’s more, physicians
who use handheld computers will pull out
their palmtops and enter the prescription
information right there while the patient
is still sitting in the examining room.
Once the value of this technology is

**Electronic prescriptions will not only help reduce
ers but also help to increase efficiencies.**

not only help reduce errors but also help to
increase efficiencies. The electronic pre-
scription will be sent immediately to the
pharmacy and to the third-party payer so
that it could already be adjudicated by the
time the patient gets to the pharmacy. If
there is a problem with the adjudication, it
could be sent right back to the pharmacist
or to the physician.

Q: One of the most significant aspects of
CVS.com’s partnership with Healtheon/WebMD will be the ability to use
electronic prescriptions. Is that right?
A: It is a component of the deal, yes.
Even before the Healtheon/WebMD D
deal, we were already working with several
providers of e-script technology. We believe
the electronic prescription will be very
important in terms of increased efficiency
and patient compliance. A lot of times, a
doctor will write a prescription on a piece
of paper and that prescription will never get
filled. With an electronic prescription, the
doctor will know instantly that the script
has been transferred to the pharmacy and
the doctor will know when the script gets
filled and when the patient picks it up. So,
the physician will be in a better position to
monitor the patient’s therapy with that drug.

Q: Is the electronic prescription being used
now?
A: We are very close. Initially, it will
not have a huge impact because
some physicians are still a bit leery of the
technology and only a small number of
doctors are up to speed with it now. But
demonstrated in terms of efficiency and
improvements in patient compliance with
medication orders, then its use will take off
quickly. It’s going to be a significant part of
Internet health care and a huge part of what
we do here at CVS.com.

Q: When introducing a new system such
as electronic prescriptions is there a diffi-
culty in getting all the necessary hardware
or software to the physicians?
A: It’s not difficult. It just takes some
integration in getting the systems
connected. But it isn’t difficult for those
people who know what they’re doing.

Q: That leads to another question I have
about information systems. Can you discuss
what CVS.com is doing to manage
inventory efficiently, for example?
A: Regarding inventory, we have the
highly automated processes for stock
control and reordering. We have used tech-
nology to try to help patients and to
improve our own efficiencies through
things like refill reminder services and auto-
matic refill services, which address compli-
ance through the use of technology.

We are using technology in a number of
exciting ways. We have an interactive
health risk assessment (HRA) on our Web
site. That’s a case in which we have used
technology to give us an interactive tool for
patients. They can answer a simple quiz that
takes maybe 10 minutes of their time. It
identifies their health risks and what condi-
tions they might be at risk for and it offers
some suggestions for initiating conversa-
tions with their physicians. The HRA is
based on the recommendations in Healthy
People 2000, which is published by the U.S.
Public Health Service.

Q: Do you find that, while there’s an effort
to collect data such as HRA informa-
tion, you now have a significant volume of
patient information that many people consider
to be confidential? Can you discuss CVS.com’s
efforts to collect data on consumers and to keep
it confidential at the same time?
A: We have made a firm commitment
to protect each person’s privacy
rights. Members of our professional pharma-
cy staff are the only people at CVS.com
with access to a customer’s confidential
record, such as prescription history. We also
have the TRUSTe seal on our Web site, and
this organization holds us to certain stan-
dards regarding privacy rights. We have
strict policies about privacy. The HRA will
function with or without the customer’s
name. When we gather the information, we
protect the identity of the person so that
the information stays in our system and we
do not use it in any way. Also, we have the
security measures in place so that no one
can get that information from us.

Q: Can you identify some of the most
pressing problems pharmacists and
pharmacy directors at managed care organiza-
tions face today?
A: One of the most difficult problems is
the increasing number of prescrip-
tions and the increasing volume that phar-
macists handle. That’s only going to con-
tinue as baby boomers age. Also, there’s a
shortage of pharmacists in many states, and
that makes for a bad mix. Our solution to
that problem is to increase the use of tech-
nology to increase efficiency such as the use
of the Web site for ordering online, having
automated services, having pharmacists at
the Web site available to answer patients’
questions, and give patients very personal-
ized attention.

Q: While you are facing these new prob-
lems of increasing volume and a short-
age of pharmacists, the old problem of getting
patients to comply with medication orders con-
tinues. What can pharmacies like CVS.com do
to help retail pharmacists ensure that patients comply with prescription orders?

A: The refill reminder service is a good thing to help compliance. Encouraging customers to enroll in an automatic refill service would be another strategy that would help ensure compliance. Increasing awareness through educational efforts is another way to help increase patient compliance.

Q: Given that so many medications are available today, what does CVS.com do to identify which pharmaceuticals are the most appropriate for each condition and for each patient? How do you balance cost versus value?

A: For CVS.com, the way we are addressing the issue of making sure each patient gets the most appropriate medicine is during the sale process. If there is a problem with a prescription, we will call the physician and discuss that problem. If there is a more appropriate drug that may be available at a lower cost and if we have the patient's consent, we may change their therapy to save them some money. Or, if it is a therapeutic issue, we will discuss it with the physician.

It is comparable to the traditional retail setting in which we have a patient profile that includes a list of allergies, drugs, and diseases. We evaluate the new drug ordered against the profile and consult with the physician if we have a recommendation to make. This recommendation could range from a problem with the prescription, a suggestion for a more appropriate drug, or simply a request for authorization to substitute with an alternative to save the customer some money. Of course, there may be a situation in which a patient has gone to another pharmacy for a prescription and not told us, so there may be other drugs we don’t know about. In this case, we would need to educate that patient that it’s best to use one pharmacy. And, if a patient is using more than one physician, each one needs to be aware of all of the medications that his or her patient is taking. If possible, it's best to have patients use one primary care physician and one pharmacy so that we can monitor their care together.

TRUSTe Program Helps To Ensure Privacy on the Web

M any Internet sites that seek to ensure the privacy of computer users have enrolled in the TRUSTe Privacy Program. CVS.com, for example, is a licensee of the program.

TRUSTe (truste.org) is an independent, nonprofit organization in Cupertino, Calif., whose mission is to build users' trust and confidence in the Internet by promoting the principles of disclosure and informed consent. Sites that want to demonstrate a commitment to privacy agree to disclose their information practices and have their privacy practices reviewed for compliance by TRUSTe. By displaying the TRUSTe mark, CVS.com has agreed to notify customers about what personally identifiable information is collected through the site, how the information is used, and with whom the information may be shared.

Customers who have questions or concerns about the site’s privacy statement are encouraged to contact CVS.com directly. If the customers do not receive acknowledgment of their inquiry or the inquiry is not addressed satisfactorily, customers then should contact TRUSTe, which will serve as a liaison with those running the Internet site to resolve the customer's concerns.

On its site on the Internet, TRUSTe says it believes an environment of mutual trust and openness will help keep the Internet a free, comfortable, and richly diverse community. "As an Internet user, you have a right to expect online privacy and the responsibility to exercise choice over how your personal information is collected, used, and shared by Web sites," TRUSTe says. Therefore, the developers of the TRUSTe program designed the program to ensure that privacy is protected through open disclosure and to let computer users make informed choices.

Those Web sites that agree to TRUSTe's terms will post what TRUSTe calls its "trustmark" a seal that is displayed on member Web sites. "The trustmark is awarded only to sites that adhere to established privacy principles and agree to comply with ongoing TRUSTe oversight and consumer resolution procedures," TRUSTe says. "Privacy principles embody fair information practices approved by the U.S. Department of Commerce, Federal Trade Commission, and prominent industry-represented organizations and associations." TRUSTe says these principles include:

• A doption and implementation of a privacy policy that takes into account consumer anxiety over sharing personal information online
• Notice and disclosure of information collection and use practices
• Choice and consent, giving users the opportunity to exercise control over their information
• Data security and quality and access measures to help protect the security and accuracy of personally identifiable information

A consumer visiting a Web site that displays the TRUSTe trustmark can be assured that the site will disclose its practices regarding the gathering and use of personal information and that it will do so in a straightforward privacy statement, generally using a link from the home page. A Web site may use more than one trustmark if personal information privacy practices vary within the site, TRUSTe says.
The medical model is to expect perfection and to punish an individual when errors occur. But the most effective way to reduce the likelihood of accidents is to change the system as a whole.”

—Lucian Leape, MD, Harvard School of Public Health

Study Shows Pharmacists’ Role in Treatment

A study by Lucian Leape, MD, and other researchers demonstrates that a more active role for pharmacists in treatment can help reduce adverse drug events (ADEs). A pediatrician and professor of health policy at the Harvard School of Public Health in Boston, Leape has written extensively about medical errors and wrote an article on the most recent study, “Pharmacist Participation on Physician Rounds and Adverse Drug Events in the Intensive Care Unit,” that was published in JAMA, July 21, Vol. 282, Issue 3.

Leape and researchers from other academic medical centers studied the treatment of 75 patients in an ICU and a coronary care unit at Massachusetts General Hospital in Boston. He estimates that ADEs in those units were reduced by 66% as a result of having pharmacists in the units. In 1995, a cost estimate of preventable ADEs showed that each preventable ADE cost about $4,700, including the costs of litigation. “For the year 1995, we estimate that 58 ADEs were prevented by using a pharmacist in just a single treatment unit, a cost reduction in that single unit of about $270,000 per year,” says Leape and his colleagues in the JAMA article.

The intervention required no additional resources, and represented only a different use of an existing pharmacist’s time, says Leape. “Rather than spending time checking and correcting orders after they had been sent to the pharmacy, the pharmacist was involved at the time the order was written,” he says. “While participating in rounds as a member of the patient care team, the pharmacist reduced ADEs both by preventing errors and by intercepting them.”

The pharmacists prevented errors by providing information about doses, interactions, indications, and drug alternatives to physicians when medication was ordered, and they intercepted errors by immediately reviewing all orders and correcting deficiencies before they were transmitted to the pharmacy.

“In addition, the pharmacist prevented nursing medication errors by providing ready consultation to the nursing staff and teaching drug safety,” says Leape. “The on-site pharmacist took overall responsibility for medication safety, spotting unsafe conditions, and identifying needs for process improvement. The presence of the pharmacist on rounds was well accepted by physicians, as evidenced by the fact that 99% of the recommendations were accepted. We conclude that participation of a pharmacist on medical rounds can be a powerful means of reducing the risk of ADEs.”

—MS

(Continued from page 1)

reason. The trick is to find the reason for the error, the underlying systems failure.”

Seeking Answers
In recent months, several health care and federal agencies have issued reports on the causes of ADEs and other medical errors and how to prevent them. The Institute of Medicine (IOM) in Washington, D.C., issued a highly publicized report, “To Err Is Human: Building a Safer Health System,” in November 1999 that called for several measures to reduce medical errors, including the formation of a National Center for Patient Safety and mandatory and voluntary reporting systems when an error is committed. A branch of the National Academies of Science, the IOM conducts research for federal agencies on public health policy. Several U.S. Senate committees, including Veterans Affairs and Health, Education, Labor and Pensions, are considering legislation designed to implement the recommendations. In February, two senators introduced the “Medical Error Reduction Act,” which calls for 15 demonstration projects to test whether a mandatory, voluntary, confidential, or public reporting system is best when gathering information on ADEs and other medical errors.

Several health care organizations are supporting the legislation. The American Hospital Association (AHA) in Chicago says hospitals have long been concerned about ADEs, but more could be done. “Most hospitals have systems in place, particularly in terms of medication, to make sure errors do not occur,” said Jack Lord, MD, chief operating officer of the AHA and a forensic pathologist. “Is there better coordination that could be done? Yes.” Existing systems include periodic chart reviews and the voluntary reporting of medication errors.

Officials with the AMA agree that steps need to be taken to reduce errors. “Medical errors are a matter of great concern to physicians, who all recognize their occurrence as a serious issue,” says Donald Palmisano, MD, a surgeon in New Orleans who is a trustee of the AMA and a member of the board of the National Patient Safety Foundation (NPSF) in Chicago, a branch of the AMA. “There’s no doubt more needs to be done to reduce ADEs,” Palmisano adds. “We don’t think mandatory reporting is the answer, but automated prescriptions are a good step.”

The American Society of Health-System Pharmacists (ASHP) in Bethesda, Md., which represents 30,000 pharmacists who...
practice in hospitals, HMOs, and long-term care facilities, supports a mandatory medical error reporting system to strengthen voluntary reporting systems.

“We need to move beyond the culture of blame that has traditionally surrounded the issue of medical error and begin to establish standardized reporting systems that take a lessons-learned approach to the problem,” says ASHP President Bruce E. Scott. “The ideal system allows sunshine into the processes that create error so that we can change those processes and protect patients. This system should focus on three primary goals: accountability, quality improvement, and enhancement of patient safety.” The ASHP also supports more active involvement of pharmacists in the treatment process, and more studies on the best systems to put in place to avoid ADEs.

ADEs occur because of failures in one or more of four stages of the drug ordering and delivery system, the studies show. The four stages are: physician ordering, transcription and verification, pharmacist dispensing and delivery, and nurse administration to patients. Physicians’ errors include overdosing and underdosing, prescribing drugs to which patients have documented allergies, and prescribing drugs known to interact adversely with other medications patients take. Nurse administration errors include giving drugs other than those prescribed, giving drugs at the incorrect time, and giving patients the incorrect form of a drug, such as an injection rather than a tablet.

“The vast majority of errors occur in the physician-ordering and nurse-administration stages,” says David Bates, MD, an internist at Brigham and Women’s Hospital in Boston who has studied ADEs at hospitals in Boston. “Errors in dosage are the most common in the ordering and administration stages, while drug identity errors were most common in the pharmacy dispensing stage. Wrong-drug errors were a leading problem in the administration stage as well.”

Computerization

Bates has studied the effect of computerization on ADEs. “Computerized physician order entry provides information on dosages and gives reminders about drugs at the time orders are written,” he says. “It addresses the twin objectives of system changes to reduce errors: decreasing the incidence of errors and increasing the likelihood that errors do occur will be intercepted. The computer system will reduce the likelihood of errors by providing information when it is needed for ordering, by reducing the number of choices to be made by the physician through suggested dosages and frequencies, and by providing the orders to nursing and pharmacy simultaneously, eliminating transcription errors. It will increase the likelihood of intercepting errors by means of checks and reminders, such as drug-drug interactions and allergies, to identify errors in an order before it is executed.”

In 1997, Brigham and Women’s implemented a computerized prescription program. It cost $1.4 million to implement and the hospital spends $500,000 a year to maintain the system. It is credited with catching 400 ADEs or potential ADEs a week out of 13,000 medication orders, Bates says. According to the GAO report, studies have shown that ADEs, both preventable and unpreventable, cost about $2,000 each, so “the system pays for itself almost weekly,” he says.

The AMA, AHA, and ASHP have issued reports saying the use of computerized dispensing systems will decrease ADEs by identifying drugs through proper labeling, including the use of bar codes, documenting administration information, tracking ADEs, transmitting physician orders, and freeing pharmacists for direct clinical consultation.

The Institute for Safe Medication Practice (ISMP), a pharmaceutical industry research and policy agency in Huntington Valley, Pa., says computerizing prescription hospital orders could reduce a major cause of medication errors—look-alike drug names and packaging. “This problem is one of the root causes in over half the errors reported through our voluntary Medication Errors Reporting Program,” says Michael R. Cohen, ISMP president. “We believe it would be advantageous to build alerts into the computer system to warn about error

(Continued on page 16)
potential, as well as to apply auxiliary warn-
ing labels to drug products, and use bold
print to clearly distinguish letters that differ
in look-alike drug names on drug product
and storage bin labels."

The Pharmacist’s Role
When physicians, nurses, and pharmacists
have been convinced that the information
would be used to improve quality and not
for personal censure, they have willingly
offered information and helped investigate
the causes of errors in medication use, says
Bates. “They also proved capable of identi-
fying the underlying systems failures and of
devising systems changes to correct these
deficiencies,” he adds. “While these activi-
ties require substantial commitments of
time and effort, the savings from reductions
in adverse drug events more than compen-
sate for the costs.”

Cooperation between medical and
pharmacy staff in studying ADEs has had
a positive effect on the role of pharmacists
at both Brigham and Women’s and
Massachusetts General Hospital, in
Boston, Bates says. Both facilities have
begun to redefine the role of pharmacists
working at their facilities, he says. “The
idea is to make them on-site members of
the unit patient care team,” he says. “The
pharmacies at both hospitals have reorga-
nized their staffing assignments and job
descriptions to make it possible for a phar-
macist to be present on wards for the
major part of the day. The pharmacist
becomes part of the team, making rounds
with the physicians in the morning when
orders are written and working with the
nurses. He or she serves as an on-site
resource about drug indications, interac-
tions, compatibilities, and administration.
Thus, the pharmacist prevents errors and
intercepts them.”

“There’s a great deal more work to do
about reducing ADEs,” Leape says, “But I
think the first steps that should be taken are
very clear. We should take advantage of cur-
rent technology to computerize our dispens-
ing systems and take advantage of the
expertise that now exists by actively involv-
ing pharmacists in the treatment process.”
—Reported and written by Martin Sipkoff, in
Gettysburg, Pa.

“Most medication errors in hospitals involve
prescription orders and the administration of drugs.
Pharmacists make relatively few medication errors
when they transcribe, verify, and dispense hospital
prescriptions.”

—Janet Heinrich, General Accounting Office