

Technology To The Rescue

Dr. Susan Andrews' search for an electronic medical records (EMR) system began in April 2000, when the hospital that owned her family practice in Murfreesboro, Tenn. announced that it was dissolving the relationship. Faced with the prospect of doing their own billing and scheduling, Dr. Andrews and three other doctors in the practice decided that instead of purchasing a stand-alone system, they would "jump into an EMR," Dr. Andrews says.

After researching the applications they wanted and the vendors that were in the marketplace at the time, the practice spent about \$17,000 per doctor for EMR software as well as billing and scheduling programs. Hardware costs came to about the same amount, Dr. Andrews says, noting that in the four years since the group made its initial investment, computer equipment prices have dropped dramatically.

Patient safety experts have long extolled the virtues of information technology in the reduction of medical errors. Yet, the adoption rate of computerized patient records has been slow; an estimated 14 percent to 28 percent of practices have deployed EMRs, and it's unknown how many of those are comprehensive systems using standardized protocols.

By October, the EMR system was in place. Dr. Andrews and her partners started with prescription

and patient notes modules, and in December added billing. The EMR functions have continued to expand, and the system now manages prescriptions; maintains patient notes; automatically enters billing, diagnostic and procedure codes and transmits them to the billing department; generates patient education materials for conditions such as diabetes, and tracks immunizations and the status of critical tests, health screenings and exams.

“We have a template for diabetes that automatically tells us the last laboratory values, when they were done and protocols for how often to do certain lab tests and what the results should be,” Dr. Andrews says. All of that information is in front of the doctor when a patient comes in, along with a list of all the medications the patient is taking, the date of his or her last eye exam and other health screenings.

Every time a doctor opens a note or sees any patient, a list of overdue procedures—Pap smear, mammogram, cholesterol screening or flu shot, for example—appears. Items on the list can be adjusted according to particular diagnoses, medications or a patient’s age. The front-office staff members see the same list when they schedule patient appointments, “so it’s not just doctors seeing that information,” Dr. Andrews says.

“There is nothing we can do that would have a bigger impact on improving patient safety than computerizing records,” says Dr. Lucian Leape, adjunct professor of health policy at the Harvard School of Public Health. **“We’ve talked about it for 45 years and it’s long overdue.”**

The EMR makes it possible to quickly fax patient summaries to hospitals and other providers. When patients are admitted to the hospital, for example, the practice can send relevant patient information in a minute, Dr. Andrews says.

Currently, the practice is incorporating an “electronic encounter form,” Dr. Andrews says.

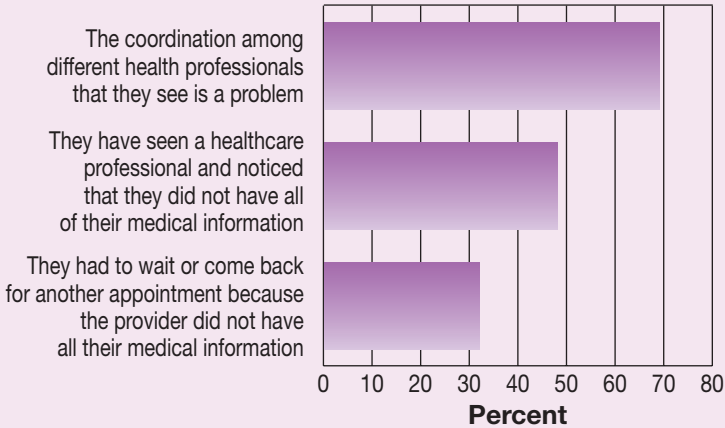
Since implementing an EMR system, the practice has improved the quality of care and achieved significant savings, Dr. Andrews says. Doctors practice in two separate sites, and one of those offices has cut 1.5 employees by computerizing transcription and eliminating the use of paper charts. In addition, the practice has taken its billing in-house.

“Staff is working more efficiently,” Dr. Andrews says. The staffers are no longer “chasing charts.”

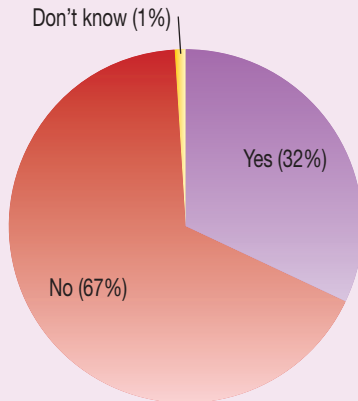
For the past three years, Dr. Andrews and her partners have participated in the Practice Partner Research Group, a research initiative that gathers and feeds back quality indicator data to 88 practices nationwide. Every three months practices get a booklet that shows how well they are doing in seven categories of patient care, based on data transmitted to the Medical University of

Public Perceptions on Role of IT In Reducing Medical Errors

Percent who say:



Have you or a family member ever created your own set of medical records to ensure that you and all of your healthcare providers have all of your medical information?



Source: Kaiser Family Foundation / Agency for Healthcare Research and Quality / Harvard School of Public Health National Survey on Consumers' Experiences with Patient Safety and Quality Information, November 2004 (Conducted July 7 - September 5, 2004).

South Carolina in Charleston.

“We’ve improved how well we are doing with patient care a tremendous amount,” Dr. Andrews says, particularly in areas such as control of diabetes and the number of patients receiving critical vaccines such as flu and pneumonia.

“I can’t think of anyone who couldn’t improve their practice and save money by implementing an EMR,” Dr. Andrews says.

Despite Benefits, EMRs Uncommon

Patient safety experts have long extolled the virtues of information technology in the reduction of medical errors. Yet the adoption rate of computerized patient records has been slow, observers say.

An estimated 14 percent to 28 percent of practices have de-

Twelve Steps to Selecting an EMR System

The California HealthCare Foundation’s EMR buyer’s guide for small physician practices, produced by Forrester Research, describes a 12-step approach to selecting an EMR:

1. List high-priority needs. For example, “save time and improve quality.” The authors urge purchasers to be specific about their frustrations and areas in which the practice could gain efficiencies, such as time-consuming chart pulls, telephone tag with the pharmacy to clarify prescriptions and coding problems linked to imprecise documentation.

2. List the EMR features most likely to meet those needs.

3. Factor in future requirements. These may include collaborations with local hospitals in electronic record sharing and adding or changing clinicians, office sites or specialties.

4. Develop a simple request for proposal (RFP). Spell out priorities on functionality, usability, support and cost for the practice and ask each vendor to describe in writing how their system will address them. “The RFP should include component-by-component pricing requests for two or three product combinations,” the guide says.

5. Make the commitment that doctors will enter data. An EMR depends on users to enter information daily and build up a data repository that generates information.

6. Choose either a keyboard and mouse or stylus and touch screen.

7. Test-drive each system using common scenarios. Rather than

ployed EMRs, and it's unknown how many of those are comprehensive systems using standardized protocols, said Dr. John Lumpkin, chairman of the National Committee on Vital and Health Statistics (NCVHS), in a memo last fall to Tommy Thompson, then secretary of Health and Human Services.

A survey conducted last summer by the American Academy of Family Physicians (AAFP), however, reflected growing interest in EMRs among family doctors. Among 788 AAFP respondents, nearly 40 percent said they had either converted to EMRs or were in the process of doing so. Nearly three-quarters of the 310 respondents that had EMRs indicated that the systems had improved the health of their patients, in part by reducing prescribing errors and enhancing patient communication, the AAFP reported. Nearly half (49 percent) of survey respondents said they

limiting demonstrations to those prepared by sales staff, "stipulate a scenario, on the spot, as the basis for the demonstration," the guide says. For example, create a scenario in which a physician from the practice examines the patient with a specific medical history, condition and complaints in order to test the EMR's ability to effectively document the visit.

8. Get three physician references, with no financial ties to the product, from each vendor. References should be located in the immediate area so that potential buyers can visit the sites, observe the system in operation and ask questions about the vendor.

9. Score competing candidates. Review how their offerings stack up against each other.

10. Settle on a purchase plan. The basic choice is between purchasing a system outright through a software licensing fee per user or physician, and an application service provider (ASP) plan. Under an ASP arrangement, doctors pay a monthly fee to access an EMR system over the Internet, as opposed to buying and maintaining the software in-house.

11. Get commitments on initial implementation and technical support. The implementation plan should cover conversion of data from paper records, interfaces with billing and other existing computer systems, configuration of features such as alerts values and clinical guidelines, and on-site training.

12. Take advantage of a buyer's market. With dozens of vendors claiming to make EMRs for small- to mid-sized practices, take advantage of the competition by negotiating for bells and whistles at no charge.

wanted to purchase an EMR, and 15 percent of those plan to do so within a year, 16 percent within two years and 18 percent after two years. Only 7 percent said they had no plans to purchase an EMR.

“There is nothing we can do that would have a bigger impact on improving patient safety than computerizing records,” says Dr. Lucian Leape, adjunct professor of health policy at the Harvard School of Public Health and a member of the Institute of Medicine panel that produced the 1999 landmark report, “To Err Is Human.” “We’ve talked about it for 45 years and it’s long overdue.”

Harnessing the power of information technology is at the core of a new vision for the practice of family medicine that’s being advanced by the AAFP through its Future of Family Medicine Project.

“As we talk about a new model of care, the central nervous system of the practice will be an electronic health record (EHR) that meets a number of criteria, and will help us do a much better job of taking care of patients,” says Dr. Stephen Spann, professor and chairman of family and community medicine at Baylor College of Medicine in Houston, and chairman of the task force that studied and reported on financing this new model of care. The goal

Identifying and Overcoming Barriers to Electronic Prescribing

Barriers to universal adoption of electronic prescribing by physicians:

- Cost of buying and installing a system.
- Time/workflow impact: Initially, increased time compared with paper prescribing.
- Time/RVU to review a warning.
- Lack of reimbursement for costs and resources.
- Safety improvements not fully publicized.
- Not an expected standard of care.

Driving physician acceptance is likely to require:

- Proven value in safety/quality improvement.
- Systems that are quick to install, easy to learn and fast in use.
- Financial or other incentives to overcome cost.

Source: eHealth Initiative, Electronic Prescribing: Toward Maximum Value and Rapid Adoption, April 2004.

of the project is to transform family-medicine practice “to make it more responsive to patient needs, safer and to deliver higher-quality care in terms of processes and outcomes,” Dr. Spann says.

To achieve that, doctors need information systems that prompt them with reminders about needed screening tests, check for drug interactions and allergies every time a prescription is written, and offer “embedded decision support” to guide chronic disease and acute-care management, Dr. Spann says.

For example, when a patient with diabetes comes for a check-up and hasn't had a cholesterol screen in 16 months, a reminder will pop up saying that the test, which should be done annually, is due. Ideally, information systems also should connect doctors to up-to-date databases where they can retrieve evidence-based treatment guidelines so that “with a click of a mouse doctors can get the latest information” at the point of care, Dr. Spann says. Other technology-related improvements that would impact patient safety include e-mail communication with patients, he adds.

“We believe that the Internet and e-mail are going to enhance our ability to take care of patients,” Dr. Spann says. Many patients would like to communicate with their physicians “in an asynchronous manner,” with queries about their condition and management of chronic diseases, medical questions and appointment scheduling, Dr. Spann says. In addition, patients could benefit from receiving their latest test results, such as blood sugar level, electronically, he adds. The problem is that many health plans don't reimburse doctors for the time invested in this type of communication.

“There will have to be a way to reimburse physicians for their time to do this,” Dr. Spann says. “Patients are used to doing things through e-mail and on-line with other industries. This will be an important part of [healthcare] as well.”

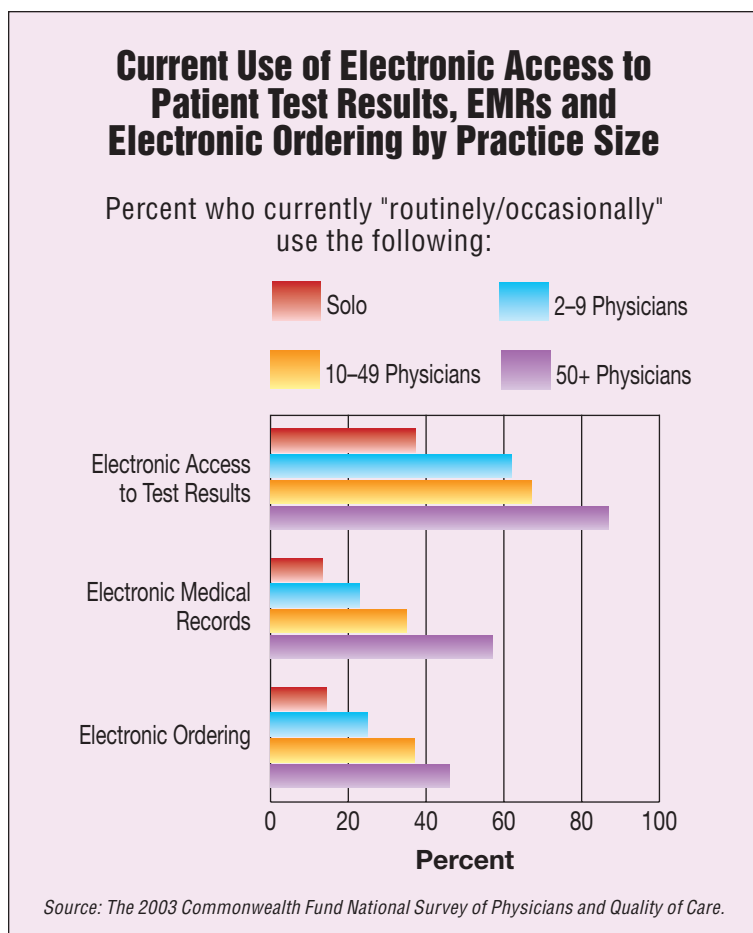
In the new practice model envisioned by AAFP and other primary-care organizations collaborating on the project, IT will be used to reduce errors prospectively, through prevention, and improve quality retrospectively through data analysis that feeds information—such as immunization rates and their patient population—back to practitioners to help them improve care.

While all the elements and technologies are in place to make these capabilities feasible, the average small group practice faces

the challenge of finding the time, expertise and funding to put the tools together, experts say.

A 2003 survey conducted by the Commonwealth Fund, for example, found that “the only information technology used routinely by physicians is electronic billing.” The diffusion of systems considered critical to improving patient safety—such as EMRs, computerized prescribing, order entry and clinical decision support—has been much slower, the study found.

Results of the survey, published in the Dec. 7, 2004, Medscape



General Medicine, an on-line journal, showed that larger practices employing salaried physicians were more likely to use EMRs than solo or small-group practices (*see chart on facing page*).

“There remains a technological divide between physicians depending on their practice environment and mode of compensation,” said lead study author Dr. Anne Marie Audet, assistant vice president for quality improvement at the New York-based Commonwealth Fund. This discrepancy needs to be addressed, Dr. Audet said, since three-quarters of U.S. physicians provide care in solo and small-group practices.

Overall, only a quarter of the 1,837 survey respondents said that they practiced in a “high-tech” office where technology “is used routinely to improve operational efficiency and clinical care,” the Commonwealth Fund reported.

An eHealth Initiative report released last April found that while universal adoption of electronic prescribing had the potential to save \$27 billion and prevent more than 2 million adverse drug events annually, only 5 percent to 18 percent of doctors and other clinicians used electronic prescribing.

In solo practices, for example, only 13 percent said that they used EMRs, while 37 percent had electronic access to test results, and 14 percent used electronic ordering. Doctors in groups ranging in size from two to nine reported higher rates of technology utilization, with 23 percent using EMRs, 62 percent accessing test results electronically, and 25 percent using electronic ordering. In groups of 10 to 49 doctors, 35 percent said they were using EMRs, 67 percent had electronic access to test results, and 37 percent engaged in electronic ordering.

The highest-reported rate of utilization for information technology was among groups of 50 or more physicians, where EMRs were used in 57 percent of practices, 87 percent had electronic access to test results, and 46 percent used electronic ordering.

“The findings make clear that while IT is viewed by many as the future of medicine, there are major stumbling blocks that will need to be removed to get physicians to routinely use it in their everyday practice,” said a statement on the study from the Commonwealth Fund.

The biggest barrier to technology adoption, the survey found,

was cost. While the federal government has made IT adoption a top priority and has appointed a national IT coordinator, Dr. Au-

Questions to Ask When Assessing EMR Systems

In its assessment of individual EMR products, Forrester researchers conducted a four-part analysis and posed questions in each area that could also be used as a guide by physician purchasers.

In the first area, EMR functions and features, Forrester asked how quickly and effectively the doctor could do the following:

- View the patients problem lists, medications, test results and other critical information?
- Document the visit and the clinical decision-making process?
- Identify clinical issues through alerts and reminders?
- Decide clinical issues with the help and support of knowledge references and databases?
- Order labs, images and other non-medications?
- Communicate electronically with colleagues, exchange secure e-mail with patients, and structure patient communications to facilitate physician decision making?
- Match ICD and CPT codes to the details of the patient encounter, integrate an evaluation and management coding tool, and integrate standardized clinical vocabulary?
- Comply with rules and regulations on privacy and consent?
- Aggregate individual data into records for easy viewing and graphing?
- Manage a patient's chronic diseases and conditions?
- Standardize disease management goals for subgroups of chronic disease sufferers?
- Query the system's database to generate individual and group reports on clinical care, quality, outcomes and costs?
- Conduct research, registry, and clinical trial-related efforts?

In the areas of usability and support, questions posed by researchers included the ease with which doctors and their staff could input information; access the system remotely; integrate their existing practice management system and claims processing service; get help with the implementation process; access help desk assistance, and arrange reasonably priced software upgrades.

In the cost arena, purchasers should look for financing flexibility, through the offer of both monthly and long-term license purchase agreements, and the option to buy systems under a flexible arrangement, as needs and budgets allow.

det and her co-authors called for stronger federal leadership and funding.

“To spur wider adoption among physicians, policymakers will need to focus on ways to make IT tools accessible and affordable to all physicians,” the Commonwealth Fund said, citing the examples of the United Kingdom and Sweden, where doctors who invest in the EMRs receive government subsidies. As a result nearly 60 percent of physicians in the U.K. and 90 percent of those in Sweden use IT.

In a 2003 report on the use of computerized physician order entry in ambulatory settings, the Center for Information Technology Leadership (CITL), a research organization chartered by Partners HealthCare in Boston, cited studies that found that only 16 percent of primary-care doctors and 11 percent of specialists used an EMR in their practice. Hospitals and healthcare delivery systems have also been slow to adopt the technology, CITL reported, citing recent surveys that found that only 32 percent of hospitals had a computerized physician order entry (CPOE) system in place, and only 13.7 percent required doctors to use the system.

There’s been heightened discussion about the role of technology in preventing errors and improving quality, says Dr. Jonathan Teich, chief medical officer for Healthvision and a professor of medicine at Harvard Medical School. “What hasn’t been as widespread is the adoption and use” of EMRs, CPOE and electronic prescribing, often referred to as e-prescribing, says Dr. Teich, project chair for an eHealth Initiative report on the optimal design and implementation of electronic prescribing systems in ambulatory settings. The report, released last April, found that while universal adoption of electronic prescribing had the potential to save \$27 billion and prevent more than 2 million adverse drug events annually, only 5 percent to 18 percent of doctors and other clinicians used electronic prescribing.

“There haven’t been enough hard drivers to compel widespread, rapid adoption” of information technology, Dr. Teich says.

A survey conducted last July by the Medical Group Management Association (MGMA) asking members to identify the three most significant barriers to EMR implementation found that

among practices with fewer than 10 physicians, the biggest impediments were lack of resources to invest in information technology (48.4 percent), time and effort to prepare the organization for EMRs (43.8 percent) and the skills and preferences of support staff (29.3 percent). The results, based on the 345 responses, also identified the difficulty of integrating systems (28.7 percent), lack of provider support (26.4 percent) and the difficulty of establishing a good return on investment (26.1 percent) as important barriers.

In larger practices with 10 to 49 doctors, the top two barriers cited by 128 respondents in this category—cost (47 percent) and time and effort (42.5 percent)—

EMR capabilities that are linked to error prevention include improved communication tools; easy and quick access to medical knowledge; built-in information, such as appropriate drug dosage; decision support, and patient monitoring. In one study, computerized order entry for prescription drugs reduced by more than 80 percent the number of medication orders with doses exceeding the maximum.

were the same as in smaller practices. The difficulty of establishing a good return on investment, however, moved into third place, with 33 percent of respondents flagging that issue, while the difficulty of integrating systems ranked fourth at 32.5 percent.

Large practices with 50 or more doctors continued to identify cost as the greatest barrier, with 49.4 percent of 68 respondents targeting cost as one of the three most significant stumbling blocks to

EMR implementation. Lack of provider support ranked second at 41.4 percent, and the difficulty of establishing a good return on investment was third, at 37.9 percent.

MGMA is in the midst of a project funded by the federal Agency for Healthcare Research and Quality to determine how many doctors use EMRs, and how they are being used to perform a variety of functions in medical management, says Dr. William Jessee, president and chief executive officer of MGMA. The results “should give us a lot more information about where the field really is” in adopting and implementing EMRs, Dr. Jessee says.

The study, which will be finalized this spring, has already found that the term electronic medical record “doesn’t necessar-

ily mean the same thing to everyone,” Dr. Jessee says. While many practices have gone paperless and believe that they have an EMR, what they actually have done is transitioned to electronic dictation and transcription, and electronic storage of lab results and other data. “But it is not an EMR in the sense that all the data is structured and stored in a relational database where you could retrieve all patients with diabetes” and find out the last time a particular test was conducted on a particular patient, he says.

“There’s a lot of fuzziness in what terms mean to the field,” Dr. Jessee adds. In addition, doctors may say that their practice is using an EMR, but what they mean is that two of the 14 doctors in the group use the system, says Dr. Jessee.

MGMA is developing tools to help practitioners and evaluate EMRs and make decisions about which system best meets their needs.

“We’re encouraging [members] to hurry up before they are run over by the snowball,” Dr. Jessee says. “There’s so much momentum behind IT, particularly e-prescribing, but it’s not a matter of will it happen or will it be required, but how quickly.”

In its detailed report on computerized prescribing, the Washington, D.C.-based eHealth Initiative—a nonprofit group that promotes health information technology and whose members include providers, employers, health plans, technology groups, research institutions and government agencies—called on stakeholders that stand to benefit from the quality improvements and cost savings associated with information technology to ease the cost burden on doctors and other providers by offering them financial incentives to implement EMRs and electronic prescribing.

Government and private payers could accelerate the adoption of technology by reimbursing providers for the utilization of information systems and by paying for improved quality performance related to implementation, the report said. Pharmacies could also defray the costs of e-prescribing by paying physicians transaction fees for its use, while malpractice insurers could reduce premiums for practitioners who adopt information systems.

“Doctors will make use [of technology] if it makes financial sense and it is quick and easy to use,” Dr. Spann says.

The Case for EMRs

Patient-safety experts agree that information technology cannot stand alone as a strategy for reducing medical errors, but they also agree that doctors and other health practitioners cannot maximize safety and quality improvements without the aid of technology.

In other industries, information technology has made possible what has been called “mass customization,” the production of goods and services to individual specifications, said a report by Dr. David Bates and Dr. Atul Gawande at Boston’s Brigham and Women’s Hospital and Harvard Medical School. Consumers in the market for a computer, for example, can build one to their precise needs on the Internet.

While medical care is far more complex than a computer purchase, “safe care now requires a degree of individualization that is becoming unimaginable without computerized decision support,” said the report, published in the June 19, 2003, issue of *The New England Journal of Medicine*. Health information systems can instantly flag interactions among patient medications and perform complex calculations, the study authors said. For example, more than 600 drugs require an adjustment of dosage for varying levels of renal dysfunction, Drs. Bates and Gawande re-

CPOE Systems Deliver Savings

Annual per-provider savings for main classes of Ambulatory Computerized Provider Order Entry (ACPOE) systems.

	Basic ACPOE	Intermediate ACPOE	Advanced ACPOE
Brand-to-generic Switching	0	\$897	\$897
Other Medication Savings	\$2,083	10,783	16,323
Laboratory Savings	62	1,313	3,027
Radiology Savings	258	2,988	6,580
Avoided Hospitalizations	104	606	1,003
Total	\$2,507	\$16,587	\$27,830

Source: “The Value of Computerized Provider Order Entry in Ambulatory Settings,” Center for Information Technology Leadership, May 2003.

ported. Such a task “is poorly performed by human prescribers without assistance but can be done accurately by computers,” they said.

As information technology grows more sophisticated, it can play a vital role in reducing the risk of harm to patients receiving medical care by “streamlining care, catching and correcting errors, assisting with decisions and providing feedback on performance,” the report said.

EMR capabilities that are linked to error prevention include improved communication tools; easy and quick access to medical knowledge; built-in information, such as appropriate drug dosage; decision support, and patient monitoring, said the report. In one study cited by the authors, computerized order entry for prescription drugs reduced by more than 80 percent the number of medication orders with doses exceeding the maximum.

The American College of Physicians’ (ACP) patient-safety education program includes an entire module on information technology. The module details the benefits of EMRs and how they improve safety through the following features:

■ **Universal chart access.** EMRs eliminate the problem of unavailable paper records, allow more than one person to work on the record at a time, and make it possible to access health information off-site.

■ **Electronic interfaces.** Laboratory and x-ray results directly imported into the record electronically are less likely to contain errors or to have missing data. This saves time that practitioners can devote to decision making.

■ **Data availability.** Paper records are often fragmented, incomplete and easily misplaced or misfiled. As a result, clinicians “lack the information they need to make decisions,” says ACP’s prepared program on information technology. When data are more accessible, they can also be used to generate outcomes data that help the practice improve its quality and safety performance.

■ **Quality assurance.** EMRs make it possible to access large numbers of patient records quickly and easily, and to measure quality indicators and outcomes that would not be possible to capture through paper records without significant effort. Practitioners can use these capabilities to detect the effect of their diagnosis and treatment and to improve compliance in areas such

Six Levels of E-Prescribing

- **Basic electronic reference.** Drug information, dosing calculators and formulary information are available but not automatically shown while prescribing.
- **Stand-alone prescription writer.** Search drug by name and create prescription; no long-term data about the patient is accessible.
- **Patient data is included.** Demographics, allergy, formulary and payer information is available.
- **Medication management.** Prior medications are available for renewal, interaction checks, etc.
- **Connectivity.** System allows communications between doctors' offices, pharmacies, payers, pharmacy benefit managers and patients.
- **Integration with EMR.**

Source: eHealth Initiative, Electronic Prescribing: Toward Maximum Value and Rapid Adoption, April 2004.

as health screenings.

- **Integration with knowledge resources.** Electronic medical databases allow clinicians to enter queries during the patient visit to help identify diagnosis and treatment options.
- **Decision support.** Physicians can access systems ranging from a simple drug reference to the most current and relevant evidence-based medical information.
- **Computerized physician order entry (CPOE).** Ordering medications and tests electronically minimizes errors due to poor handwriting, improper terminology, ambiguous orders and incomplete information. Prescribers can receive on-screen prompts for dosage information, drug interactions and reminders that ensure similar drugs are not confused, or that a drug is not appropriate for patients with a particular medical condition.

Preventing Drug Errors

Among the most widely touted and documented features of electronic medical record keeping is e-prescribing. The CITL report for example, found that more than 8.8 million adverse drug events (ADEs) occur each year in ambulatory care, and more than 3 million of them are preventable. The report, based on a literature review of nearly 2,000 studies and expert input from ven-

dors and users of CPOE, projected that an advanced CPOE system in ambulatory care settings nationwide would eliminate more than 2 million ADEs annually and avoid nearly 1.3 million doctor visits, more than 190,000 hospital admissions and more than 130,000 life-threatening ADEs.

CITL defined advanced CPOE as a system that includes electronic ordering, alerts and decision support for medications, laboratory and radiology tests. Universal adoption of such a system could save as much as \$44 billion a year through more cost-effective medication and testing decisions and the prevention of ADEs.

“The savings include switches from brand-name to generic medications, switches from expensive medications to less-expensive alternatives in the same therapeutic class, and more appropriate drug utilization,” the report said.

Under most current reimbursement methods, those savings would accrue to payers, CITL said. However, based on average national capitation data, the report projected that the typical provider using advanced CPOE in an ambulatory setting could save close to \$28,000 a year, including more than \$17,000 in medications, nearly \$7,000 in radiology, \$3,000 in laboratory expenditures, and \$1,000 from ADE-related hospitalizations. Savings would also accrue to providers in the form of a reduction in rejected claims, CITL said.

Spurring physician acceptance of CPOE, however, will likely require proven value in safety and quality improvement, systems that can be quickly installed and are easy to use, and financial incentives to overcome cost barriers, said the eHealth Initiative report.

“The organizational and cultural challenges required for clinicians in practice to make the transition, the fact that the systems are not considered ‘essential,’ and the up-front cost without a significant financial return focus on clinical practices as the

In addition to cost, one of the biggest barriers to EMR adoption among doctors is “the perception that it will slow them down, and make things more difficult,” says Dr. Jonathan Teich, professor of medicine at Harvard Medical School. “Doctors don’t want computers to be an annoyance. In a busy practice, it’s all about how productive you can be.”

largest opportunity to drive universal adoption at this time,” the report said.

Getting Started

Heightened attention to the needs and concerns of small- and medium-sized group practices that are interested in adopting an EMR system has generated substantial resources aimed at helping them identify their needs and sift through product options in the marketplace.

Medical societies and patient safety organizations have published a spate of on-line resources to walk physicians through the EMR selection process, describe key features to look for in EMRs and rate product offerings.

Last summer, 14 medical organizations, including the American Academy of Family Physicians and the American College of Physicians, announced the creation of the Physicians Electronic Health Record Coalition (PEHRC) to help doctors acquire and use health information technology.

A Sampling of EMR Vendors for Small Practices

Company	Product	Website
Allscripts Healthcare Solutions	TouchWorks	www.allscripts.com
Amicore	Clinical Management	www.amicore.com
GE Medical Systems Information Technologies	Logician	www.medicalogic.com
iMedica	PhysicianSuite	www.imedica.com
Medical Manager Health Systems (WebMD)	Intergy	www.medicalmanager.com
Misys Healthcare Systems	Misys EMR	www.misyshealthcare.com
NextGen Healthcare Information Systems	NextGen EMR	www.nextgen.com
Physician Micro Systems	Practice Partner Patient Records	www.pmsi.com

Source: *Electronic Medical Records: A Buyer's Guide for Small Physician Practices*, California Healthcare Foundation, October 2003.

“While physicians are adopting information technology in growing numbers, there remain substantial economic and technical barriers to full-scale deployment of electronic health records, especially in small- and medium-size medical practices,” said PEHRC co-chair Dr. David Kibbe, director of the AAFP’s Center for Health Information Technology. “The PEHRC will allow physicians to address these barriers with a unified voice and be powerful advocates for putting health information technology in the service of quality of care.”

Dr. Peter Basch, medical director for the eHealth Initiative and co-chair of the fledgling PEHRC, said the group was “essential to advancing the adoption of EHRs in every physician’s office.”

The Agency for Healthcare Research and Quality (AHRQ), meanwhile, has launched a three-year research project to “further define the value proposition” of health IT, says Dr. Scott Young, director of health IT at AHRQ. The initiative is aimed at addressing the funding challenge faced by physician practices that want to adopt health IT, but can’t justify the expense.

Most physician practices are “high-volume, low-margin businesses,” Dr. Young says. Capital investments usually come out of doctors’ pockets, and in the absence of a “well-defined value proposition, asking physicians to invest [in health IT] is iffy,” Dr. Scott adds. “It is up to us to further define the value proposition.”

Dr. Young suggests that doctors start the IT journey by asking, “What problem do I want this solution to address?” Practitioners should assess the capabilities they need, such as e-prescribing, faster documentation and retrieval of laboratory results, and integrating and sharing files with other providers. Physicians need a “clear sense of that from the beginning, because there are a host of solutions, all of which answer different questions,” Dr. Young says.

Practices also need to identify their partners in the venture, including other small offices, health plans and hospitals, to “understand what their drivers are,” Dr. Young advises. Once they identify suitable products, doctors need to ask a lot of questions of vendors and seek out “neutral information” on systems before making a purchase, he adds.

AHRQ is developing a National Health Information Technology Resource Center to offer expert and technical advice to help

healthcare providers find and implement the best system for their needs. The new center is currently open to agency grantees but will eventually offer expanded access to the provider community, Dr. Young says.

In addition to cost, one of the biggest barriers to EMR adoption among doctors is “the perception that it will slow them down, and make things more difficult,” says Dr. Teich. While practices that have adopted EMRs have gained efficiencies, physicians need more education about the benefits of EMRs, and models to help them maximize those benefits “so that practices can make use of EMRs and get up and running quickly,” Dr. Teich says. “Speed drives acceptability,” he adds. “Doctors don’t want com-

Computerized Prescribing No Panacea: Study

Electronic prescribing is not a total shield against medication errors, according to a recent survey by the United States Pharmacopeia (USP), a nonprofit organization that monitors and promotes drug and supplement safety. Nearly 20 percent of hospital and health system medication errors reported to USP’s national medication-reporting service MEDMARX in 2003 involved computerization or automation.

Errors that result from using a computer can occur in any phase of the medication-use process: prescribing, transcribing/documenting, dispensing, administering and monitoring, says USP. Computer entry (CE) errors occur when incorrect or incomplete information, such as patient names, drug doses or laboratory test results, is entered into a computer system. According to USP’s data, most CE errors occurred in either the transcribing/documenting phase or dispensing phase of the medication-use process.

In 2003, CE errors were the fourth leading cause of medication errors, according to MEDMARX data. CE errors have steadily increased and represent 11.5 percent of all MEDMARX records from 1999 through 2003. The data indicate that nearly three-quarters of all CE errors occur after an order is written but before the medication is administered to the patient.

“It would seem logical that applying computer technology to the medication use process would have a significant positive impact in preventing medication errors,” said Diane Cousins, R.Ph., vice president of USP’s Center for the Advancement of Patient Safety. “Yet, depending on the computer’s design or user competence, new points of potential errors can emerge. Healthcare providers need to be focused and vigilant in their use of computers.”

puters to be an annoyance. In a busy practice, it's all about how productive you can be."

One of the risks of an EMR is "alert fatigue" from systems that produce so many reminders that doctors stop paying attention to all of them, including those that are critical, Dr. Teich says. EMRs "need to provide shortcuts to the common things" that occur in a practice, he adds. A typical primary-care provider, for example, uses about 50 drugs, while a specialist commonly uses 30 to 40 drugs. Prescribing systems, therefore, should have a favorites list that doctors can quickly choose from, Dr. Teich says. "You need to look for shortcuts for the most common workflows and streamline the heck out of it," he says. An EMR should "do most common things as fast as possible, and everything else somehow," Dr. Teich adds.

Among the many resources available to doctors seeking the best EMR for their office is a guide for small physician practices produced by Forrester Research for the California Healthcare Foundation. The guide, authored by Michael Barrett, Bradford Holmes and Sara McAulay, was released in October 2003 and is geared to practices with nine or fewer physicians. Available on the AAFP's Center for Health Information Technology Website (www.centerforhit.org), along with a wide array of technology-related resources, the guide provides a detailed evaluation of eight EMRs appropriate for small offices. Researchers identified the basic features that physicians should look for in any system, and described functions that will become more critical over time as doctors prepare for future needs.

Most EMRs on the market today include a core set of basic functions related to entering, storing and retrieving clinical information, the guide says. At a minimum EMRs should allow doctors to do the following:

- View critical information, including problem lists, medication lists and test results in an organized way.
- Document patient visits.
- Customize information displays.

Beyond those basics, "the great potential of EMRs lies in equipping doctors with relevant information at the point of decision on the point of care," the guide says. Doctors should, therefore, look for systems that give them the following capabilities:

- Identify clinical issues through alerts and reminders.
- Access clinical decision support linked to medical references and databases.

EMRs should also integrate computerized physician order entry (CPOE) for medications, tests, images and other services, and electronically route those orders to pharmacies and other clinicians. In addition, the system should facilitate secured communication among practitioners in a way that stores messages as part of the patient record.

“While physicians are adopting information technology in growing numbers, there remain substantial economic and technical barriers to full-scale deployment of electronic health records, especially in small- and medium-size medical practices,” says Dr. David Kibbe, co-chair of the Physicians Electronic Health Record Coalition, a group created to help doctors acquire and use health information technology.

The guide further recommends that EMRs facilitate electronic communication and consultations with patients, and provide patient educational materials to help them self-manage their conditions.

Ideally, EMRs should make it possible to manage the health of patient populations in a practice or larger community by:

- Standardizing disease management across an entire group, so that clinicians can “identify subgroups of disease sufferers among their patients and track adherence

to disease-management guidelines and care plans,” the guide says.

- Querying system databases to produce group reports on care, quality, outcomes and costs.

- Conducting clinical research. “An EMR should be flexible enough to accommodate the doctor’s decision to participate in research, registry and clinical trial related efforts,” the guide says.

“Our goal is that family physicians will adopt this model sooner than later in a massive fashion,” says Dr. Spann, referring to AAFP’s new model for care in which EMRs have a critical role. While cost is a primary consideration for most practices, many vendors are becoming sensitive to pricing and bringing their costs down, he adds. AAFP has negotiated with several EMR vendors who have agreed to make discounts available to the organization’s members.

Despite significant challenges in the transition to wide dissemination of EMRs, experts predict that most practices will be using them within five to 10 years.

“We have an immensely complex healthcare system,” says AHRQ’s Dr. Young. “When you look at a system that complex and think about something that’s as powerful and changing as health IT, it gives me reason to believe that it will take a little time to do that,” he adds. “Our mission is to help accelerate the integration of solutions into everyday practice. I’m optimistic that it will happen.”