

How Technology Can Help

Chapter FastFACTS

- 1.** Electronic tools can prevent errors by eliminating handwriting, compiling lists, and highlighting patients' drug allergies.
- 2.** Doctors can qualify for up to \$44,000 apiece in EHR incentive payments from either Medicare or Medicaid over five years starting in 2011.
- 3.** EHRs can prevent "near misses" by reminding you to do follow-ups.
- 4.** Digital cameras can reduce errors by helping you identify patients, record symptoms such as rashes, and share images via e-mail.
- 5.** Geisinger Health System's EHR reduced the use of dangerous abbreviations from more than 6,000 to around 1,500.

Like many other doctors, Jacob M. Reider, MD, has a wall of textbooks in his home office from his medical school days. He occasionally fantasizes about his teenage son's using those books when he himself goes to medical school. But the reality about today's information age intrudes almost daily, either in Dr. Reider's practice or in his main job as chief medical information officer for the medical software vendor Allscripts: Those textbooks have been obsolete for decades.

"Healthcare providers make decisions, and the best decisions are well-informed [ones]," says Dr. Reider, who practices fam-

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ily medicine part-time in the Albany, N.Y., area. “Electronic medical references take the place of that musty pile of textbooks. They’re updated weekly or daily. Those textbooks were current two years before they were printed, so by the time they get to my desk, they’re already out of date.

“A lot of the information you need in daily practice is things you once knew, or things you sort of know” but want to double-check, Dr. Reider says. “If it’s in a giant textbook down the hall, you probably won’t seek it out; but if it’s on the computer screen within a few keystrokes, you probably will.”

You can eradicate many kinds of medical errors by the use of electronic tools. These tools can eliminate handwriting, remind you of details you may have forgotten (about patients as well as diseases and treatments), compile lists of your patients who are due for flu shots or colonoscopies, highlight drug allergies in bright yellow, keep you up to date on the latest research, and generally help you conquer the flood of paper-based information that is the enemy of efficient and effective care.

The same electronic tools can enhance the financial side of your practice. Although some physicians balk at the costs involved in getting a system up and running, electronic tools can improve charge capture and speed up the revenue cycle enough to pay for themselves. And if you’re not ready to take the plunge, other options may be available. (See Health Information Exchanges: “EHR Lite,” opposite.)

Of course, technology doesn’t ensure perfection. You may click the wrong box, overlook a vital screen of information, or inadvertently delete a message or file. But if you carefully select, implement, and use electronic systems—whether an e-prescribing system (see “E-prescribing: A Free Tool to Get You Started,” p. 52.), an online medical information service, or a full-blown EHR—they can be tremendous partners in quality care.

The Ups—and Downs—of Federal Incentives

Part of the federal economic stimulus package passed in 2008 is intended to kick-start adoption of health information technology. The relevant section of the American Recovery and Reinvestment Act is called Health Information Technology for Economic and Clinical Health (HITECH). Doctors can qualify

Health Information Exchanges: ‘EHR Lite’

Communication gaps among providers cause many medical errors; but if a piece of information is already in a computer somewhere, a properly designed network should be able to make it accessible to anyone who needs it. Before the Internet, that kind of network was prohibitively expensive, but not anymore.

Many regions and states are working on establishing “health information exchanges” (HIEs), portals where healthcare providers can collect any information available on a given patient, whether from hospitals, pharmacies, reference labs, specialists, or primary care physicians. Some HIEs are run by state or local government entities; some by stand-alone, not-for-profit organizations; and others by a consortium of providers in a given market. The federal government is underwriting this activity to the tune of more than half a billion dollars as part of the 2008 stimulus package. A recent report from the eHealth Initiative, a trade group, estimated that 57 health information exchanges are operational, and 140 more are in the planning stages.

Even practices that don’t yet have EHRs may be able to use the data from an HIE as an “EHR lite,” depending on how it’s set up. Go to <http://www.ehealthinitiative.org>, to find out what’s available in your area.

for up to \$44,000 apiece in incentive payments from either Medicare or Medicaid over five years, depending on how much Medicare or Medicaid work they do, and whether they have installed a “certified” EHR and are using it in a “meaningful” way by the beginning of 2011.

The payments start at a maximum of \$18,000 for the first year and gradually decrease until 2016, when there are no more incentives; instead, Medicare will then cut payments to doctors who aren’t using EHRs. The total price tag for the plan is commonly estimated at around \$20 billion, which includes both the cash outlay and the savings that Medicare is projected to achieve from wide use of EHRs. That number also includes the money that the programs expect to save by cutting payments to physicians who aren’t using EHRs.



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E-prescribing: A Free Tool to Get You Started

If you haven't yet used electronic prescribing, there's no reason to wait. E-prescribing software is available free through the National ePrescribing Patient Safety Initiative (NEPSI, at <http://www.nationalerx.com/>). It's based on software offered commercially by Allscripts, one of the industry leaders in physician office software. The free offering started in 2007 and is being used by 45,000 physicians and other prescribing providers for millions of prescriptions annually.

"It's an on-ramp to electronic health records," says Allscripts chief medical officer Jacob Reider. The tool lets users enter a patient's current medications, problem list, and allergies (which it uses to automatically check for side effects and interactions;), write a prescription; and send it directly to a pharmacy. The pharmacist can use the system to return a message alerting the physician to allergies or other potential problems noted on the patient's pharmacy record, or to let the physician know when the patient needs a refill.

Many physicians are delaying investments in EHRs until the government clarifies what it means by "certified" and "meaningful use." For the first, the Department of Health and Human Services (HHS) is expected to contract with an independent entity, most likely the Certification Commission for Health Information Technology (CCHIT), which has previously certified EHRs under an HHS contract. (See <http://www.cchit.org> for more information.) Certification generally means that a system can perform certain functions and handle data in specific ways that make it easier for various systems to communicate with one another. The Centers for Medicare and Medicaid Services was scheduled to publish a definition of "meaningful use" and start collecting comments on it early this year. (To keep current, visit <http://healthit.hhs.gov/portal/server.pt>.)

Physician specialty societies and the Medical Group Management Association (MGMA) are keeping a careful eye on the details for HITECH implementation, and members should check in regularly for the latest developments. In November, the MGMA sent a sharply worded five-page letter to HHS explaining the potential pitfalls of moving too quickly or imposing unreasonable expectations on providers.

In any case, if your practice hasn't invested in an EHR, it's

time to start shopping. Large, well-established EHR vendors will do whatever it takes to become certified in order to preserve their business. The same goes for meaningful use: If their clients don't get the incentive payments they're expecting for installing and using an EHR (or, worse, start to lose money in 2016), those vendors won't last long. The basic objective of shopping for a computer system—finding a vendor who can deliver—hasn't changed. And if you wait, there will be legions ahead of you in the implementation line. If you're in doubt about your vendor's ability to fulfill government requirements, write it into your contract and/or pick a vendor that can show you a clear plan for complying with the HITECH requirements.

The Real World Beyond the Hype

Can EHRs live up to the hype? A study presented late last year garnered media attention for showing that hospitals with advanced electronic record systems had very little discernible difference in their quality of care compared with hospitals that lacked such systems, suggesting that EHRs may not live up to the high expectations. But the authors of the study, which was sponsored by the Harvard School of Public Health and presented at a meeting there, cautioned against drawing that conclusion. They emphasized that all organizations—from large hospitals to small medical practices—have to restructure the way they work in order to achieve the full benefit of computerizing clinical information. And they noted that most haven't yet made that difficult transformation.

To give you a better idea of how these tools play out in the real world of primary care, here are the stories of several practices that are using electronic tools to reduce errors and improve care.

Digital Cameras and Other Technology Prevent Errors

Framingham Pediatrics—Framingham, Mass.

While pediatrician Andrew S. Baumel, MD, is describing how his practice's computer system reduces errors, one of his partners comes in to recharge the battery on a digital camera. It turns out that this camera, too, is a key piece of technology for reducing errors in the practice. One way it helps is in positive identification of patients.

“When [we] go into the waiting room and call for ‘Brittany,’ five kids get up,” Dr. Baumel says. If a digital photo is attached to the EMR, the nurse knows immediately which is the right one. Dr. Baumel and his five partners also use the camera to record the appearance of lesions or rashes so they can track changes over time, to do before-and-after pictures in surgical cases, and to e-mail images to specialists to supplement verbal descriptions. “A picture is worth more than a thousand words and is great for cutting down on errors,” Dr. Baumel says.



“When we first went on the electronic record, our patients didn’t believe our staff were even talking to the doctors because the callbacks came so fast. We were getting back to them within 15 or 20 minutes rather than hours later.”

Amanda Heidemann, MD
Medical Director, EHR Project
BJC Medical Group

Of course, such use of digital photography presupposes a digital medical record. Framingham (Mass.) Pediatrics uses practice management software and EHRs from eClinicalworks, Westborough, Mass. The practice acquired the system in 2005 after using a stand-alone e-prescribing system for several years.

Having the practice management system tightly integrated with the EHR means that bills are automatically generated from information in the record. The physician chooses the appropriate code, rather than having a coder guess it after the fact by studying the chart. The system alerts the provider to perform all the appropriate tests or services associated with a given diagnosis—and to bill for them.

The EHR’s registry function helps Dr. Baumel and his colleagues keep current on services that often fall through the cracks. “I can call up all the asthmatic patients who got a flu shot in the last three months, or all the patients under nine who haven’t had one,” he says. “I can see how many of my autistic patients have seen a neurologist.”

EHRs can dramatically improve a practice, but only if they’re

properly tended. “The key thing is to have all the providers be consistent and do the same thing,” Dr. Baumel says. “The EMR isn’t going to put data in—you need people to do that. If you’re not putting [accurate data] in, the record is just garbage. It won’t make you less error prone. You can’t just say, ‘Oh, I have a computer.’ You have to be diligent about making sure the problem list and the medication list and the allergies are up to date. If you don’t, you won’t trust it.”

Providing Information Faster, Preventing ‘Near Misses’ BJC Medical Group—St. Louis, Mo.

From the patients’ perspective, an EHR has made physicians at BJC Medical Group look remarkably efficient. “Patients always complained that it took too long to get a callback, because you had to go and pull the chart,” says Amanda Heidemann, MD, medical director for the EHR project. “When we first went on the electronic record, our patients didn’t believe our staff were even talking to the doctors because the callbacks came so fast. We were getting back to them within 15 or 20 minutes rather than hours later.” Instead of saving all those callbacks for a specific block of time, Dr. Heidemann and her colleagues can easily fit them in among their patient visits now that everyone’s information is immediately accessible.

BJC, a 200-physician multispecialty group with 75 locations around St. Louis, is on its second EHR, having started on a different vendor’s system in 2002 as part of a “paperless office” pilot project. The practice started installing an EHR from Nextgen, Horsham, Pa., in 2006. Dr. Heidemann says the practice has seen a lot of “good wins” on patient safety from having an EHR—mostly in better communication and more complete, legible information.

“It’s very helpful to use an electronic format that has a con-

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sistent view of the patient and all the information on a single screen,” she says. “And it’s also helpful for ‘near-miss’ prevention, because you can set it to remind you to do follow-ups when there’s been a test, or when a patient needs more frequent screening than normal.”

The practice also uses an electronic prescribing program and an add-on called Community Health Solutions (CHS) that allows physicians to see medications and certain other information on 300,000 area patients, gleaned from the records of other health-

Interfaces between the EHR and reference labs reduce errors in transcription and data loading, and the improved turn-around time can reduce misdiagnoses. One of BJC’s early “wins” was more accurate diagnosis of strep throat, made possible because test results were coming back 12 to 18 hours earlier.

care providers in the community. “Often I find something a patient fails to tell me that is pertinent to their treatment,” such as a medication they use “as needed” that would affect the physician’s choice of what to prescribe, Dr. Heidemann says. The combination of CHS and e-prescribing also allows her to see whether a patient has a pattern of shopping around to get drugs.

The combination of an EHR and a practice management system keeps billing as clean as possible, Dr. Heidemann says. For example, the software can keep track of which insurers cover which medications, tests, and treatments, and can alert the physician at the point of care if the patient’s payer might automatically deny a certain item. If so, the physician can either change the order or call the insurance company to explain the scenario and try to get an okay for the original plan. Either tactic can save weeks of waiting or, worse, a claim denial.

BJC has grappled with the challenge of how to make it easy for physicians to enter data in the record while making it equally easy to extract that information for tracking quality-of-care indicators. “It’s a balancing act,” Dr. Heidemann says. “We know that documentation through checkboxes is faster and more precise, but physicians aren’t used to documenting that way.” They’re often more receptive once Dr. Heidemann and her infor-

mation technology colleagues explain all the ways they can use the data entered via checkboxes, radio buttons buttons that allow the choice of only one item, and pull-down menus. For example, the system can easily produce a list of all patients who suffer from chest pain, and show how many received an EKG or were managed in a particular way. “There are always going to be certain scenarios that are better served by free text, but things that are fairly standard can be documented with checkboxes,” she says.

In addition, interfaces between the EHR and reference labs reduce errors in transcription and data loading, and the improved turnaround time can reduce misdiagnoses. One of BJC’s early “wins” was more accurate diagnosis of strep throat, made possible because test results were coming back 12 to 18 hours earlier.

Flexible EHR Improves Records and Billing

Lifetime Health Medical Group—Rochester/Buffalo, N.Y.

Unlike many physician practices that limp along partly on paper and partly electronic—which can cause errors when the two parts aren’t coordinated—Lifetime Health Medical Group scanned all its paper records before it started using its new EHR in 2007. “It was a safety issue,” says Mark Cohen, MD, chief of internal medicine and medical informatics for the nine-location, 55-physician practice that has offices in Rochester and Buffalo, N.Y. “It didn’t make sense to have part of the record electronic and the rest on paper in the storage room.”

Dr. Cohen and his staff spent two years studying the practice’s workflow and hardware needs before installing an EHR and practice management system from Nextgen. Once scanning was complete, the practice began installing the new software in early 2007 and finished in mid-2008.

Nextgen’s system is large and complex, Dr. Cohen says, but he has ensured that Lifetime’s version of the system gives its physicians a lot of flexibility in how to enter data. They can type, check off boxes, or dictate, using Dragon voice recognition software that puts their words directly into the record. “The most valuable course I ever took was typing in high school, but I don’t know how many other doctors can type,” Dr. Cohen says. All the physicians have wireless laptops, and they often do their notes or dictation while they’re with the patient. Most of the practice’s

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ePocrates, available in both a free version (basic drug information) and a premium version that includes continual free updates, medical news, and information on diseases and lab tests (also available for Blackberry through the Blackberry App Store, <http://appworld.blackberry.com/>).

Medcalc, a free app with a wide range of scores, formulas, and calculations, searchable by name or keyword. You can customize a list of the calculations you need most frequently.

Taber’s Medical Dictionary, unlike the hard copy, can conveniently fit in your pocket. It’s free with an annual subscription (currently \$49.95) to the Taber online version. Also available on Blackberry.

Stat ICD-9 Coder, with current codes, for \$29.95, lets you look up the correct code quickly and easily. This coder could pay for itself within hours, depending on your current level of coding accuracy. Try out Stat ICD-9 Lite, which has 2008 codes, for free, to make sure you want to commit.

PubMed on Tap lets you access PubMed on the go, save references, and even view full pdf versions of papers (if you have access privileges for the journal in which they were printed), all for \$2.99 (or free for a version with fewer features).

Skyscape Medical Resources is a portal to several free databases, including RxDrugs (drug information for thousands of brand and generic drugs, including hundreds of integrated drug-dosing calculators), Outlines

physicians got the hang of the system after a few weeks, and they now complete their records at least as quickly as they did on paper, and sometimes more quickly.

The system reduces medical errors in number of ways, as shown by the following:

- It checks **potential interactions**, not just between drugs but also between a drug and a patient’s medical condition. “It warns us if we try to give an albuterol inhaler [for asthma] to someone with a history of heart arrhythmia, or a beta blocker to an asthmatic,” Dr. Cohen says.

in Clinical Medicine (evidence-based clinical information on hundreds of diseases and symptoms), Archimedes (a medical calculator and decision resource), and MedAlert (updated drug information, journal summaries, clinical trial results, etc., which you can choose based on specialty). Also available on Blackberry.

Pedi-STAT is a rapid reference for anyone caring for pediatric patients in a critical care or emergency environment, including dosage guides for medications for seizures, resuscitation, and pain, and weight-and age-specific guidelines for using various pieces of medical equipment.

H1N1 (Swine Flu) Update is a continuous feed of authoritative news on H1N1.

PracticeRx is a free application from *Doctor's Digest* in conjunction with the Institute for Safe Medication Practices (ISMP) that delivers ISMP's breaking news about medication safety, practice management and medication safety tips, and instant error-reporting tools.

The Blackberry App Store also offers the following:

Pocket Guide to Diagnostic Tests, providing quick information on selection and interpretation of common diagnostic tests, for \$39.95

Skin Cancer Image Viewer, a free application for accessing databases of skin lesion images

ICD-9 Coder, an AAFP-compiled database of codes most frequently used by family practice physicians, for \$9.99

Free calculators from QxMD Software, for cardiovascular, gastrointestinal, and hematologic diseases

- It goes beyond the usual allergy checking to alert for **potential secondary allergies**. For example, if a patient is allergic to an antibiotic, the system will flag arthritis medications or antifungals that often induce allergic reactions in this type of patient.

The system links chart completion with billing so that one won't happen without the other. As a result, Dr. Cohen says, charges have increased and the revenue cycle has improved; and overall the practice is seeing more patients. "You can't finish your note until you've billed," he says. "If you try, it brings you to the billing page. Once you're there, you only have to figure

out the complexity of the visit, and the system will fill out everything else.”

Lifetime uses an extra application from CINA, Dallas, which gleans information from the EHR and compiles a list of goals, action items, and recommendations for the next appointment. It lists the patient’s diagnoses, current medications, recent lab values, any other standard measures for the diagnosed conditions, and vaccine status. All the information is printed on a single



“Having all the information [from the EHR and an additional application that lists patient information and goals] in front of you has to be safer than having to go look for it.”

Mark Cohen, MD

Chief of Internal Medicine and Medical Informatics
Lifetime Health Medical Group

sheet of paper. “We batch-print them the evening before, and then the nurses review them with each patient to fill in missing information,” Dr. Cohen says. “Having all the information in front of you has to be safer than having to go look for it.”

E-prescribing: Legibility is Just the Beginning **Geisinger Health System—Danville, Pa.**

How did the use of dangerous abbreviations at Geisinger Health System plummet 75% in ten months, from more than 6,000 to around 1,500?

The physicians at Geisinger—in Danville, Pa., and environs—have been using an EHR longer than most. The EHR has been in the integrated health network for more than a decade and is an essential part of the “best practices” culture that has made Geisinger an internationally recognized model for quality care. Currently Geisinger uses an EHR from Epic Information Systems, Madison, Wis.

A few years ago, Geisinger set out to eliminate dangerous abbreviations in prescriptions—a feat that would involve painful human retraining in a paper-based system, but is much simpler

for the computer. Geisinger uses the ISMP's list of dangerous abbreviations (see Chapter 2 for more information) along with a few additions of its own. Geisinger has developed a list of medications commonly prescribed in its primary care offices, and its EHR includes standard instructions for using each one. Because the only function of abbreviations is to save time, using the pre-written instructions solves most of the abbreviation problem.

But what if the physician wants to make a change? "You can still alter the directions, but it won't let you put in dangerous abbreviations," says John Pagnotto, DO, a family physician in Geisinger's Lewistown, Pa., office. For the most part, the system uses a "soft stop"—a reminder to the physician not to use the questionable abbreviation—rather than a "hard stop," which prevents the user from making changes. The hard stop kicks in only if the prescriber goes to finalize an order that still includes a dangerous abbreviation. These days, most Geisinger physicians evoke no more than one or two soft stops per month.

A drug interaction tab within the EHR automatically alerts the physician if a prescription could cause a problem with one of the patient's existing medications. Dr. Pagnotto says the alert comes up 15% of the time. Drug interactions are a particular problem for patients on blood thinners. Geisinger participates in a "clotting clinic" with a pharmacist who manages patients who take warfarin. The clotting clinic is automatically alerted whenever one of its patients is given a new prescription, so that it can check the patient's blood ahead of the normal schedule.

Geisinger recently started transmitting prescriptions directly to the pharmacy, which Dr. Pagnotto says should increase the percentage of patients who actually get their prescriptions filled. The pharmacy can notify Geisinger if a patient asks for a refill ahead of schedule or doesn't refill an essential medication on time. "We hope to further the partnership" between Geisinger and the local pharmacies, Dr. Pagnotto says. "It's pretty exciting."