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Electronic Medical Records

Why Their Time Has Come

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Electronic Medical Records

No Longer Optional

Looking back, 2003 could make its mark as the year of the electronic medical record (EMR). Political and economic shifts are breathing new life into this decades-old movement, which got its biggest boost previously with the 1991 publication *The Computer-Based Patient Record: Essential Technology For Healthcare* by the Institute of Medicine. Today, physicians and executives are viewing information technology more favorably. And the technology itself is evolving, giving buyers more options.

> "I've never seen a more appropriate time where you have a convergence of internal factors and factors external to the hospitals and doctors and that makes it an absolutely appropriate time to move toward an EMR."
>
> *Jay Toole, national clinical transformation leader, Cap Gemini Ernst & Young*

Cases of physicians rejecting specialized clinical systems have been widely reported, but the story at a large health system in the southwest Georgia city of Albany may better represent what is actually happening with clinical information systems across America. There, at Phoebe Putney Memorial Hospital, a group of physicians recently initiated the process of acquiring an EMR system. "This is a first for me," says Patty Massey, chief information officer, "to have an entire practice enthusiastic about an EMR implementation."

"I've practiced in the business for over 30 years," says Jay Toole, national clinical transformation leader for consulting firm Cap Gemini Ernst & Young, "but I've never seen a more appropriate time where you have a convergence of internal factors and factors external to the hospitals and doctors and that makes it an absolutely appropriate time to move toward an EMR."

Purchasers apply pressure—offer relief

Perhaps the most dramatic recent change in the prospect for widespread adoption of EMR systems involves patients—indirectly. "When it comes to demand, consumers are simply not in the game," says Pat Wise, director of electronic health record (EHR) initiatives for the Health Information and Management Systems Society (HIMSS). "Most patients just don't know that

they want this. So they're not asking their providers whether they use EMR systems or other information technology to enhance care. Fortunately, payers have started to act on their behalf."

Coordinating with a variety of associations and societies, the federal government, in its role as payer, has begun a host of new initiatives. Indeed, according to the *Wall Street Journal*, the Bush administration has already promised to push for a 53 percent increase in funding to promote hospital-based applications of IT to improve medical records.[1]

Both private and public sector purchasers and payers have begun to act on the potential of information technology—particularly EMR and related systems. Already this year, the Centers for Medicare & Medicaid Services—which administers Medicare and Medicaid—and others have stepped up their efforts at promoting standards. A lack of accepted data standards has plagued the industry for decades, as the authors of a recent article in *Health Affairs* explain: "Today's commercially available CPR [computer-based patient record] software does not convey clinical records effectively from one vendor's format to another. It is necessary to write costly custom interfaces to move clinical information between different clinical software platforms. Even with such an investment, differences in the CPR systems' underlying architecture and the way that the systems are configured and used in individual institutions limit the quantity and quality of data that can be conveyed. Moreover, the prospect that private market competition will produce the necessary standardization of CPRs is slim. No vendor of CPRs has more than a 15 percent share of the CPR market."[2] Defining a common, workable structure, coding and vocabulary for EMR interoperability represents a complex challenge unique to healthcare.

Under the new Consolidated Health Informatics (CHI) initiative, the federal government has begun to put its own house of disparate coding systems in order. In March, the Department of Health and Human Services (HHS) announced a first set of uniform standards that all federal agencies will adopt. The idea is that these standards, as part of the National Health Information Infrastructure, will help prompt healthcare—including the private sector—to adopt more comprehensive, accessible clinical systems for more effective data sharing and public

"Today's commercially available CPR [computer-based patient record] software does not convey clinical records effectively from one vendor's format to another."

Health Affairs

Thanks to our Sponsors

As the demand for national health information infrastructures, patient safety improvements and electronic medical records (EMR) continues to gain momentum in Washington D.C., we are proud to recognize the sponsors of this section. The sponsorship and underwriting generosity of these companies, and their vision of the importance of EMR technology education, made production of this section possible. The intent of this piece is to summarize important recent developments in the field and provide a resource for care organizations seeking to justify the expense of EMR systems.

Thanks to **WebMD Practice Services**, formerly Medical Manager Health Systems. The company's Intergy software is a fully-integrated, state-of-the-art practice and clinical management system offering document image management, electronic encounters, patient charting and wireless connectivity. A dynamic and scalable system, Intergy streamlines workflow dramatically, improves office efficiency, and further demonstrates WebMD's commitment to systems innovation and excellence.

Thanks also to **VitalWorks**, a leading provider of healthcare information systems. VitalWorks offers a tightly integrated suite of products, which encompasses all areas of data management. In addition to its core products—Intuition PM and Intuition EMR—the VitalWorks product suite includes wireless charge capture, Palm handheld integration, Web-based patient services and a wide range of EDI services.

Finally, thanks to **QuadraMed**, who boasts 1,500 customers and a comprehensive line of end-to-end clinical and administrative products. Since its founding in 1993, the company has experienced robust growth and remained focused on developing information technologies and providing consulting services that help healthcare professionals deliver outstanding patient care with optimum efficiency.

Electronic Medical Records: No Longer Optional

"Implementing an EMR isn't everything that needs to be done, but it certainly can contribute a lot."

Randy Thomas, vice president, Healthlink

health protection. CHI, the healthcare component of President Bush's eGov Initiatives, enjoys the vocal support of HHS secretary Tommy Thompson.

In July, Thompson's HHS, keenly aware of the crucial role the private sector will play, announced two initiatives that will further the standards cause and make adoption more economically sensible.

An agreement three years in the making, HHS has signed a deal with the College of American Pathologists to license the College's highly regarded medical vocabulary, Systemized Nomenclature of Medicine Clinical Terms (SNOMED-CT). The National Library of Medicine will make the system available without charge throughout the U.S., meeting one more of the long-term requirements for medical records sharing.

HHS has also commissioned the Institute of Medicine (IOM) to design a standard, definitional model of an electronic health record (EHR), which it will share with all healthcare stakeholders. A HIMSS working group, representing the society's private sector expertise, proposed a model structure to Health Level 7 (HL7)—an ANSI-allocated standards organization—in July. And the EHR Collaborative, a broad-based consortium of healthcare organizations and associations, began public meetings to gather additional input in August. Working with HL7 and the IOM, participants expect to reconcile the various proposals in 2004.

"It's astonishing what's been happening in the federal sector," says Randy Thomas, vice president at Healthlink, a healthcare IT consultancy. Thomas points out that these efforts are actually the culmination of many years of effort. And now that patient safety and the public health system's ability to respond to national emergencies are both driving forces, taking these steps is doable and laudable. "Implementing an EMR isn't everything that needs to be done, but it certainly can contribute a lot," she says.

Perhaps most promising for doctors and hospitals squeezed financially, adjusted reimbursement is on the horizon. HHS has already announced a new demonstration program focused on rewarding hospitals with higher Medicare payments when they achieve quality targets based on reported data. Proposals for similar incentives—and loan programs—to reward EMR adoption have emerged this year as well.[1,3]

Clinicians, executives embrace the potential of IT

Physicians and healthcare executives have begun to embrace information technology more readily than ever. And nowhere is the

OSSMS Saves $100K per Year in Film Costs

While Orthopedic Surgery and Sports Medicine Specialists (OSSMS) in Newport News, Va., is a growing practice, one thing remains the same: a commitment to providing the best possible patient care. Early on, OSSMS realized the value of fully integrated technology in providing improved patient care as well as reducing costs and streamlining workflow. In 1992, they selected WebMD Practice Services, formerly Medical Manager Health Systems, as their technology partner to automate administrative and clinical processes. Sarah O'Dorisio, administrator, says there was "no contest." She knew the company would be there for the long term and was "impressed by the complete integration of the base system with the components of the electronic medical record (EMR)."

The integration of the EMR has been great for the OSSMS staff and also has enhanced the patient experience. Electronic patient chart features, point-of-care encounter documentation, document and image management, and flexible wireless and Internet solutions all resulted in improved access to patient information and enabled revised procedures and reduced wait times. Now physicians see more patients without decreasing encounter time; plus prescription and charge capture accuracy increases.

While the focus is on investing in technology to improve care and not the bottom line, O'Dorisio says the practice's profitability has increased yearly with the addition of new technologies. This year she implemented DIMDX®, an advanced diagnostic imaging system with PACS, saving the practice $100,000 a year in MRI film costs. Advanced document and image management solutions allowed OSSMS to scan their patient charts and eliminate the 8-hours per day previously spent pulling charts.

attitudinal change more significant than in this EMR "renaissance."

At the beginning of the year, the American Academy of Family Physicians conducted an online member survey focusing on the EMR. Although the majority of respondents reported not to have one in place, more than 80 percent had investigated purchasing an EMR system.[4]

Divided for the first time into multiple audiences—healthcare CIO, healthcare CEO, vendor CEO and healthcare CMO—the 14th Annual HIMSS Leadership Survey also revealed positive findings while gauging general attitudes towards IT. Fifty-six percent of physician and nursing executives judged that IT either improves or greatly improves the level of patient care. Only 3 percent indicated a negative opinion.

The survey also asked healthcare CEOs which business issues—such as cost pressures or retention of staff—they found most pressing. And when asked about their IT operation, approximately 94 percent said IT fully or partially supports the concerns they deal with every day.[5]

The healthcare community seems to be nearly as comfortable with IT as with medical technology. Perhaps it's because the hype of the Internet bubble has been replaced with a dose of reality. Perhaps it's a gradual generational shift reflected in more tech-intensive med school instruction. Or, as Lyle Berkowitz, MD, president of Back 9 Healthcare Consulting, argues, perhaps it's simply a logical response to the fiscal and technological trends clinicians and healthcare executives see around them. "There is a more common attitude that purchaser pressures will become more important in the future and that one has to act now to be prepared for that," he says. In addition, Berkowitz explains, a competitive "herd mentality" drives momentum, "Once one or two places in a community start doing it, everyone else will too, for fear of being left out when purchasers and consumers do need to make their choices." On the technology side, Berkowitz judges that outpatient EMR solutions have been hampered and delayed by the past limitations of mobile devices. But generally, progress continues. "Meanwhile, everyone is still hoping that the technology will be easier, cheaper, faster than the year before—and they are often right."

Return to Phoebe Putney Memorial Hospital in Georgia. Physicians are acting as IT catalysts because they see the value. "We decided to embark on an ambulatory EMR several months ago as we developed a new internal medicine practice," recalls CIO Patty Massey. "We recruited four physicians for this practice who really started the

From CPR to EMR to EHR: There is a Difference

To the layperson, it may seem a distinction without a difference. And, as this article demonstrates, experts often disagree about the correct naming conventions. Considering historical precedent and visions for the future, here's one way to think about the differences. According to the Health Information and Management Systems Society's Pat Wise:

Computer-based patient record (CPR) systems started it all. Although the concept dates back at least to the '80s, the CPR gained momentum with the Institute of Medicine's (IOM) publication of *The Computer-Based Patient Record: An Essential Technology for Health Care* in 1991. Though comprehensively defined and idealized by the IOM, the CPR was often a longitudinal record that captured paper-based information in an image format for later reference.

Electronic medical record (EMR) systems represent the current generation. The EMR encompasses the CPR and more. Though typically owned by a single provider organization, the EMR captures and manages patient data that originates in electronic form. The EMR, therefore, provides greater interactivity and real-time access across the enterprise.

Electronic health records (EHR) are the future. The EHR operates beyond the level of any single, proprietary information system. This is the true, lifetime medical record owned by the patient, who grants access to providers, and differs from the EHR that the IOM and Health Level 7 (HL7) seek to define.

"…purchaser pressure will become more important in the future and…one has to act now to be prepared for that."

Lyle Berkowitz, MD, president, Back 9 Healthcare Consulting

initiative on their own. I got involved when I realized they were talking with vendors and serious about making a product selection."

"Is there a generational change? Yes," observes David M. Smith, MD, a practicing family physician and EMR user. He says today's physicians emerge from residency programs with better keyboarding skills, greater familiarity with computer interfaces such as Windows and a stronger appreciation of IT impacts on medicine. "Without question, to access hospital discharge summaries electronically, online, in the waiting room, through an EMR with a broadband Internet connection, is a huge advantage."

In the introduction to his co-authored *Journal of Healthcare Information Management* article recounting his EMR experience, Smith writes that clinicians are moved to action when they see the difference these systems make. "While the EMR products continue to be enhanced over time, most notable is the growing wave of physician commitment and adoption that we see around us. Suffice it to say, this product has never been about whether it had the best technology or best return on investment. It has really been about touching the core of medicine and needing to be integrated into the very workflow of each physician and the impact of their practice with patients."[6]

As the technology matures, its appeal grows

Although experts invariably insert the caveat that technology alone cannot solve every problem—and EMR systems are no exception—recent developments have made leaps in clinical information systems' usefulness, usability and viability.

"Healthcare IT in the '90s was immature," says HIMSS' Wise. "It was cumbersome. It wasn't user-friendly for physicians. And the exponential growth of the Internet was, by itself, not enough to make a difference." We've reached a turning point now, she argues, at which user interfaces can accommodate many more clinicians' practice patterns. This application-level sophistication, combined with more powerful interoperability, has tremendous impact on a core technology like an EMR system.

The proof, it would seem, is all around us. "There's starting to be a critical mass in the marketplace, and there are starting to be some early successes," says Healthlink's Thomas, and they are being publicized by a wide range of organizations, from the Leapfrog Group's vendor evaluations to

Practice Enjoys 30% Increase in Billings

Like most practices, the physicians of Three Rivers Dermatology of Fort Wayne, Ind., frequently found themselves "down-coding" their patient visits and consultations, accepting less reimbursement than they were entitled to. In today's healthcare environment, the fear of being audited and not having the documentation to clearly support the exam levels being charged is shared among thousands of physicians all over the country.

Committed to delivering the best care to their patients and to being appropriately reimbursed for their efforts, Three Rivers Dermatology decided to partner with VitalWorks Inc., a leading provider of healthcare information management technology and one of the largest U.S. providers of specialty-specific EMR systems.

"The fact that the two products are integrated is phenomenal," says Loretta Sassmannshausen, practice administrator of Three Rivers Dermatology. The practice uses the VitalWorks Intuition™ product suite, which is based on their acclaimed Intuition PM practice management system, and Intuition EMR, the company's newest EMR system.

"It's terrific," reported Sassmannshausen, "and much more thorough." In addition, by streamlining their workflow and eliminating down-coding, the practice has experienced an extraordinary return on investment. Since using the EMR system, "billing has gone up 30 to 40 percent," according to Sassmannshausen. For the first time the practice is being appropriately reimbursed for the services it provides.

traditional stories in the trade press. "There are not hundreds and hundreds, but it's certainly not the same five or six that have been referenced up until, maybe, a year ago."

Another critical piece of the EMR technology puzzle, mobile computing, has begun fulfilling its earlier promises. Some physicians still find the mere presence of a computer a distraction. Increasingly, though, clinicians are embracing handhelds, tablet PCs and laptops for order entry, charting, remote access and other functionalities that extend the usefulness of EMR systems. Even transcription services, whether relying on voice recognition technologies or not, integrate more effectively with EMRs and clinical workflow.

No longer optional

Long a curiosity to healthcare professionals, EMR systems have become a valuable tool and are quickly acquiring necessity status, even for solo practitioners like Smith. "It allows accessibility to data that, increasingly, you can't practice without. I just shudder at the idea of going back to a practice that's paper-based," he says. And as for EMR momentum nationwide, based on what he is seeing and hearing, Smith notes a change, a quickening of the pace of adoption. "Clearly, it's happening." ■

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EHRs: The Standardization Timeline

According to the Health Information and Management Systems Society's (HIMSS) Pat Wise, the Department of Health and Human Services (HHS) recruited the Institute of Medicine and healthcare standards organization Health Level 7 (HL7) to develop a consensus standard for the electronic medical record (EMR). Consequently an electronic health record (EHR) Collaborative organization was formed by the American Health Information Management Association, the American Medical Association, the American Nurses Association, the College of Healthcare Information Management Executives, the eHealth Initiative, HIMSS, and the National Alliance for Healthcare Information Technology. Information on the Collaborative is located at www.EHRCollaborative.org.

The EHR Collaborative scheduled six public hearings in August to gather input for the Institute of Medicine and HL7, which anticipates voting on the standard at its September plenary meeting. A consensus should be reached by the end of September. Then, according to Wise, as early as Jan.1, 2004, a final vote on the standard will be taken.

Later in 2004, Wise says, HHS is expected to begin testing a Medicare/Medicaid differential reimbursement scheme, in which healthcare provider organizations using EMR systems will receive more reimbursement for services than those without technologies conforming to the standard.

According to a news release issued by CHIME, "the adoption of electronic health records is a critical step in the federal government's push toward universal healthcare computing and its pay-for-performance initiatives. Once fully implemented, a national standard for electronic health records will affect the entire health care community, including clinicians, public health agencies, hospitals, payers, researchers, suppliers, pharmacies, and most importantly, patients."

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Form Follows Functionality: Electronic Medical Record Features

Advances in technology have led to a proliferation of options for all kinds of electronic medical record (EMR) users.

Large health systems, for example, can now use EMR solutions to further their physician connectivity strategy, among other objectives. "The major vendors who have been doing hospital EMR, now are doing both," says Jay Toole, national clinical transformation leader for consulting firm Cap Gemini Ernst & Young. "They all now are offering an ambulatory EMR and an inpatient EMR that are tied together."

Mid-sized organizations with fewer needs and less demanding requirements may prefer the virtual EMR. These less expensive systems focus on indexing, storing, delivering and presenting patient data—with only basic editing or electronic signature capabilities.

With the ubiquity of broadband Internet access, small physician practices also enjoy more options. Open-source EMR systems are generating interest. ASP (application service provider) software is maturing. In fact, the Health Information and Management Systems Society and the American Academy of Family Physicians will launch an open ASP demonstration project this fall.

What an EMR should do depends on who you are. "As to what is best for any one user or institution, it's like buying a computer or a car," says Lyle Berkowitz, MD, president of Back 9 Healthcare Consulting. "It depends on what you need and how much you can spend." Nevertheless, here are some basic EMR components:

- **CLINICAL MESSAGING**, often email-based, enables enterprise-wide notification, consultation or querying.
- **RESULTS REPORTING** automates the delivery of diagnostic, therapeutic or any patient status data. Whether Web-based, email, fax or a combination, it usually allows the user to select and prioritize reporting methods.
- **THE DATA REPOSITORY**, whether a 'virtual index' or centralized, is the heart of the EMR, tracking and correlating all available patient data. The repository structures and maintains longitudinal patient records.
- **DECISION SUPPORT SYSTEMS** vary in sophistication, from simple notification to structured interfaces. Generally, however, decision support guides diagnostic or treatment choices based on selected patient data and a reference knowledge base.
- **CLINICAL DOCUMENTATION** eliminates manual charting at the point of care. Although it can be independent of the core EMR, particularly in specialized settings, documentation is increasingly viewed as a primary functionality.
- **ORDER ENTRY** systematically places requests for medications or therapies, screens for possible adverse effects or duplication, and manages the process for patient safety.

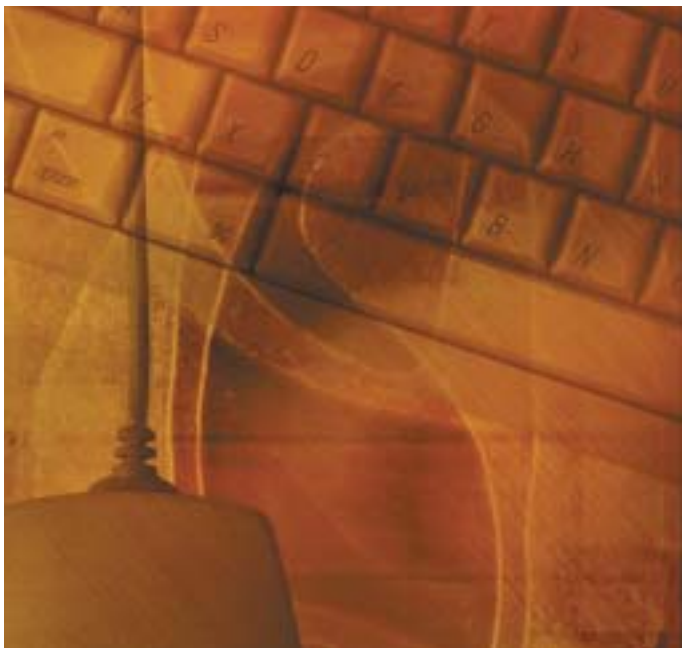
Making the Most of EMRs

How the Leaders Derive Value

If it were common knowledge and well documented that the electronic medical record (EMR) provides short-term payback, every hospital in the U.S. would have implemented one a decade ago. Yet, with less than 10 percent of all hospitals using a full-scale system[1] as of July 2001, there's reason to believe this industry-wide delay is not merely an oversight.

Overall, the environment for EMR implementation appears inviting. A PriceWaterhouse Coopers survey confirms that 42 percent of all healthcare providers surveyed plan to invest in an EMR this year.

Study after study reveals that an EMR or even a component of it—such as computerized physician order entry (CPOE)—can improve care and reduce costs. According to the Center for Information Technology Leadership in Boston, nationwide adoption of an ambulatory CPOE system would eliminate more than 2 million adverse drug reactions and more than 190,000 hospitalizations per year.[2] New research also shows a fully-operational EMR has even more potential. The Maimonides Medical Center, Brooklyn, N.Y., a winner of the Health Information and Management Systems Society (HIMSS) 2002 Nicholas E. Davies Award of Excellence, reports its EMR resulted in a decrease of medication processing time by 68 percent, a reduction of medication discrepancies by 55 percent, and a reduction of problem medication orders by 58 percent.[3]



Department of Health and Human Services (HHS) Secretary Tommy Thompson's recent announcement of two new initiatives is further evidence of federal support for adoption of EMR technologies. The National Library of Medicine's $32.4 million contract with the College of American Pathologists to license a standardized medical vocabulary, and commissioning the Institute of Medicine to develop a consensus standard for an EMR, signal both a philosophical and a financial commitment to ensure EMRs become standard throughout U.S. healthcare.

Meanwhile, Allina Hospitals & Clinics, Minnesota, reports spending more than $100 million to build an EMR for its patients in 11 hospitals and nearly 50 clinics. Its Twin Cities neighbor, Park Nicollet, says it spent about $60 million on a three-year EMR project.

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Cost vs. value

The acquisition cost for an EMR in a large hospital or system can exceed $10 million.[1] And for a physician practice to implement an EMR may cost from $10,000 to $20,000 per physician, with

Making the Most of EMRs: How the Leaders Derive Value

"It is important for healthcare executives to understand that an investment in information technology does not guarantee the success of an EMR system nor a positive ROI."

Pat Wise, director of Electronic Health Record Initiatives, HIMSS

operating costs another 25 percent per year.[1]

Even for a large, well-heeled organization, investing that much capital is difficult without well-documented evidence they can achieve payback. Information regarding an EMR's financial effects have not been well documented.[5]

Pat Wise, director of Electronic Health Record Initiatives, HIMSS, Chicago, says recent return on investment (ROI) data is good but not enough, and that the limited amount of ROI information today can be misleading. "In recent studies, only available within the last year, we are beginning to see ROI for an EMR.

"It is important for healthcare executives to understand that an investment in information technology does not guarantee the success of an EMR system nor a positive ROI," says Wise. "The investment requires not only capital but an enormous commitment from the entire healthcare institution, requiring both organizational change and changes throughout the work process. Good ROI data can help healthcare executives understand some of the financial picture, but does not tell the whole tale, including the cost."

The Maimonides case

"With profit margins down in hospitals, especially in the New York market, healthcare executives have to take a hard look at where to make that capital investment," says Anne Sullivan, CIO of the Maimonides Medical Center. "There are many options to consider—an investment in bricks and mortar, new program expansions, or an investment in an expensive EMR whose time has clearly come. However, without data to 100 percent justify the cost of an EMR implementation, this enormous decision to implement a system may be hard to reach," she says.

"Because both successful and immediate implementation of any new technology is few and far between, it is often hard to make a large capital investment, such as required by an EMR, without bone fide research," she says.

So, Sullivan made it easier for her peers by researching and documenting the cost savings achieved by the systems she implemented and the scope of her organization's ROI. According to Wise, inclusion of this compelling information in Maimonides' Davies Award entry was instrumental in winning the 2002 competition.

And this isn't the first award competition Maimonides has won. In 1998, Sullivan's efforts at Maimonides were permanently enshrined in Washington, D.C., when Maimonides won the prestigious Smithsonian/ComputerWorld Award for Medicine.

Hospital EMR Reduces A/R Days by 50%

Seamless integration—of every component—to implement a complete electronic medical record (EMR) system was the prime consideration of the Hunterdon Medical Center selection team.

The team's 15 physician members were also concerned that the incremental implementation of an EMR must have an immediate, positive impact on patient safety. This led them to specify that the system require minimum training, and have the ability to deliver dependable decision support information quickly, with 24x7 remote access.

"QuadraMed Affinity® was our unanimous choice," said Glenn Mamary, Hunterdon's chief information officer. "Affinity HIS will take our patients from registration to clinical care, and through billing in a secure, totally integrated Web-based environment. To date, we've implemented patient registration, imaging and patient charting. When we went live with Affinity Patient Charting, it was the smoothest transition of systems we've ever experienced."

Hunterdon, a 176-bed acute care facility in Flemington, N.J., is measuring the results of each step toward a complete EMR. For example, the hospital has reduced its accounts receivable days by 50 percent. And as the metrics are compiled for other system components, similar positive results indicate these components are meeting or exceeding all expectations. The next increment in this process will be the implementation of Affinity CPOE in 2004.

"Do I have an 'Affinity' for patient care and information? Absolutely," says Mamary. "Our vision was to build a complete EMR that offers clinicians access to patient information anywhere, anyplace, anytime. QuadraMed is delivering on all counts."

For the Davies Award, Maimonides documented savings and efficiencies of nearly $76 million from 1997 to 2002, rationalizing the cost of the systems within 3.84 years and achieving a remarkable 9.4 percent ROI.

Wise says that the past four winners of the Davies Awards have all included ROI information in their entry papers. Clearly, this cost-justification strategy serves CIOs. It validates their costly IT decisions and reinforces their own value to their organizations.

The Geisinger case

Starting in 1996, Geisinger Health System implemented an outpatient EMR that provides access to all lab and radiology results, with clinical decision support, electronic visit documentation, and messaging. Today, Geisinger notes many benefits and significant financial savings. Among the savings: a reduction in the number of chart pulls, from 1 million in 2001 to 700,000 in 2003 (annual savings: $900,000); a reduction of 372,000 in the number of laboratory print jobs annually; improvements in the use of formulary drugs, yielding savings of $590,000, or $1,000 per physician, per year; and, a 90 percent reduction in referrals without pre-authorizations.

"In the beginning," says James Walker, MD, chief medical information officer of Geisinger Health System, a large integrated delivery system in Pennsylvania, "we implemented an EMR to improve clinical communication, performance reporting and efficiency. A credible ROI study would have cost more than it was worth. But, we do track our information technology and services costs at about 75 percent of national benchmarks," says Walker.

The Partners case

One of the most controlled and best documented primary care EMR cost-benefit analyses to date was completed by Partners HealthCare System and published in April 2003.[5] Costs were defined as system costs—hardware, software, training, implementation, ongoing maintenance and support—and induced costs—such as a temporary decrease in provider productivity following the transition away from paper-based systems. Benefits included averted costs—from chart pulls, transcriptions, reductions in

Eight Core EMR Functionalities Specified by IOM

As part of the federal Department of Health and Human Services' initiative to develop a consensus standard for an electronic medical record/electronic health record (EMR/EHR), which provider organizations will need to implement in order to receive maximum reimbursement on Medicaid/Medicare cases, the Institute of Medicine (IOM) submitted at the end of July a "letter report" titled *Key Capabilities of an Electronic Health Record System*.

Promising a full report on data standards from the IOM in the fall of 2003, the July letter report sought to "define a functional model of key capabilities" for an EMR/EHR system and provide direction to Health Level 7 in its efforts to standardize the definition of an EMR system. To guide the identification of these key capabilities, the IOM first established five criteria that they should address: Improve patient safety, support delivery of effective patient care, facilitate management of chronic conditions, improve efficiency and be feasible to implement.

The eight "core functionalities" specified by the IOM include:

1. **Health information and data**—without which an EMR/EHR cannot exist
2. **Results management**—of lab tests and radiology reports improves quality
3. **Order entry/order management**—when computerized, are proven to reduce medical errors
4. **Decision support**—for drug prescribing and dosing, disease screening, diagnosis and treatment, improves care quality
5. **Electronic communication and connectivity**—between clinicians, enhances care quality and helps prevent adverse events
6. **Patient support**—such as home monitoring of patients, patient education and telehealth, improves care quality and reduces costs
7. **Administrative processes**—such as scheduling, billing and claims, authorizations and referrals, are all enhanced through computer automation
8. **Reporting and population health management**—automation reduces labor requirements and enhances accuracy and efficiency

adverse drug events, using alternatives to expensive medicines, and reductions in lab and radiology tests—and increased revenues—such as improved charge capture and reduced billing errors.

Using sophisticated sensitivity analyses, with time horizons of 2 to 10 years, Partners projected stunning results. For example, implementing a full EMR system yielded more than $86,000 in net benefit value, per provider, in a 5-year cost-benefit analysis.

Conclusion

Though often difficult and costly to assemble, the studies completed to date universally support, from a cost justification perspective, the implementation of EMR systems in both ambulatory care and inpatient settings. And, if the Centers for Medicare & Medicaid Services changes its reimbursements for Medicare and Medicaid services, based on EMR use by the provider, the ease in cost-justifying these systems will improve. Meanwhile, it's clear that deliberately avoiding the selection and implementation of a full-featured EMR produces unnecessary costs and lost savings opportunities. ■

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Dos and Don'ts: Selecting an EMR

Looking to implement the best, most sophisticated electronic medical record (EMR)?

Vincent Ciotti, principal for H.I.S. Professionals, Santa Fe, N.M., reminds healthcare executives of some simple dos and don'ts.

DON'T THINK ONE PRODUCT CAN DO EVERYTHING

Many companies have the vision for a single solution product. But different vendors excel at different products. Don't think a single product can meet all your needs.

DO EMPLOY A COMPETITIVE SELECTION PROCESS

Competitive bids are crucial. If you are convinced that one vendor can do the trick, still take time to meet with several and understand the process and a variety of pricing structures. A competitive bid selection always pays off.

DON'T SET UNREALISTIC EXPECTATIONS

Things take time, especially when deploying a comprehensive and often complicated EMR system. Plan ahead and understand that despite zealous efforts, delays occur.

DRIVE THE SELECTION PROCESS DOWN TO END USERS

Each day it's nurses and physicians who will use the system, not the executives who make the selection. If the system is too complicated, no one will use it. Make sure end users are involved in the selection process. They play a big role in the successful use of the product.

BUY AN EMR ONLY AFTER SEEING IT LIVE

No demo can demonstrate true value. Do interviews with end users and visit installed sites. Read user documentation and interview staff. Develop a numeric system to assess benefits and limitations and share this process with your end users.

DON'T BUY "FUTURES"

Insist on seeing what's available today, not what's promised for tomorrow. Your patients and clinicians have real needs. Before signing a contract, make sure everything you need is available today.

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