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Wired in Winona, Wireless in San Jose

E-health Strategies Take Root Across America

Executive Summary

Healthcare organizations recognize the potential of e-health to unlock the knowledge sitting in legacy systems, improve workflow for caregivers and support staff, and provide a secure and effective way to communicate with patients, payers and other stakeholders. Growing use of personal financial-management software such as Quicken and online access to bank and investment accounts are raising consumer expectations for analogous e-health tools that offer access to personal health information.

For e-health to succeed, significant social obstacles must be understood and overcome. E-health champions must make a compelling case that new tools benefit patients and make physicians' jobs easier, not harder. Caregivers must embrace electronic medical records that will, for the foreseeable future, co-exist with paper-based records. Not only must electronic records be confidential, users must be confident that they're confidential. This edition of *Information Edge* looks at how five organizations, from Maine to the far reaches of the Pacific Ocean, are seizing e-health's opportunities and overcoming obstacles in its path. The organizations we examine are ahead of their peers, as measured by a five-stage model of e-health evolution (see sidebar on page 5). All of our case studies use the Internet to publish, interact and transact. One, CareGroup, is in the integration phase. Each is determined to use e-health tools to transform how it fulfills its mission.

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Wireless in San Jose

San Jose Medical Group (SJMG) is one of the largest multispecialty group practices in Santa Clara County, Calif. Here in Silicon Valley, expectations for technology are high. The group employs 136 physicians, contracts with more than 650 others, and operates nine clinics and three urgent-care centers. It provides direct medical care to more than 120,000 HMO members and 55,000 fee-for-service patients.

In late 1998, the group decided to deploy e-health tools as part of its strategic plan for 1999. It chose to break the project into a series of five modules rather than try to install a complete system all at once, says Shahe Komshian, MD, the group's CEO. At the core is a Web portal that provides

secure messaging between physicians and patients, appointment scheduling and patient-education materials. Two of the other four modules—utilization management/claims and electronic prescribing—are installed. A practice management module for the business office, which will include scheduling, registration, claims collection and third-party liability, will be installed in the next few months. The final piece, an electronic medical record, will be installed in the next year. All modules except for utilization management—which is from Asterion.com—are from units of Allscripts, Inc.

Ease of use was particularly crucial for the electronic prescribing module, since that was the first one that physicians would use on a daily basis.

"Overwhelming doctors with things that scare them is a bad tactical move," Komshian says. "Physicians must perceive a value to them and their patients before they'll use new technologies. It might be saving time, or putting more complete data in front of them." Ease of use was particularly crucial for the electronic prescribing module, since that was the first one that physicians would use on a daily basis.

Before deploying any new tools to all doctors, SJMG tests them with a pilot group of technically enthused physicians. "We go to the doctors who want to do it before you even tell them you want to do it," Komshian says. "They are more patient, so you succeed in clarifying the product."

Prescribing a medication with a wireless handheld device is a three-step process: choose a patient, a diagnosis and a medication. The physician chooses a name from a list of that day's patients on the handheld. Each physician's most common diagnoses also are listed. If, for example, a patient has sinusitis, the doctor can type "s" and see a list of diagnoses. Clicking on sinusitis generates a list of recommended medications. "First-line therapy might hypothetically be amoxicillin, and second-line therapy might be Augmentin," says Komshian. "SJMG has made the decision to list those medications in that order. We gave that standard-of-care information to Allscripts and they put it in our system. The list will vary by patient, depending on their HMO's formulary. But prior to formulary adjustments, there's a suggestion of best practice." Clicking on a medication sends an order via a secure Internet connection to the appropriate retail, mail-order or Internet pharmacy for filling. The handheld devices are linked to online information on more than 800 managed care formularies, generic and therapeutic alternatives, and drug-utilization reviews.

Electronic prescribing has reduced SJMG's point-of-care pharmacy costs by 5% to 10%. Formulary compliance is up and use of generics since the system was adopted has increased to 63% from 55% of all prescriptions.

In the past, drug refill requests came to SJMG over the phone to receptionists and were not automatically linked to the physicians' handheld devices. The group is building a capability to capture refills as part of the electronic system. Refill requests are now directed to SJMG's refill center. Technicians check to see that the right drug is being requested and whether a generic alternative is available and appropriate. Starting in the next few months, refill requests will go over a wide area network to physicians, who will be able to approve refills using a handheld device or stationary PC.

San Jose Medical Group

San Jose, Calif.
Founded 1955

- Operates 9 clinics and 3 urgent care centers in and around San Jose and Morgan Hill, Calif.
- Network of 800 physicians, of whom 136 are employees
- Provides direct medical care to over 175,000 patients, including 120,000 HMO members and 55,000 fee-for-service patients

www.sjgsmedgp.com

SJMG's next step: implementing the MasterChart electronic medical record. "The fact that we have successfully deployed the utilization-management and electronic-prescribing modules makes the next phase much easier," says Komshian.

Wired in Winona

An old river town in southeastern Minnesota tucked between bluffs and the mighty Mississippi, Winona and its suburbs have 50,000 residents. The city has a high-speed data network connecting homes, schools, businesses and healthcare providers. Earlier this year, Winona Health, the local health system, launched Winona Health Online in partnership with Hiawatha Broadband Communications and Cerner Inc.'s IQHealth. Hiawatha provides high-speed Internet access and cable television services. IQHealth offers browser-based health information connectivity that helps health organizations integrate multiple facilities.

Winona Health is anchored by a 99-bed community hospital. The online initiative aims to improve the overall health of the population of Winona. A community-wide health assessment of users and non-users of the online initiative will be conducted in the first, third and fifth years of the project to identify the community's most common health-risk factors and to quantify the online project's impact on the community's health. Clinical data from Winona's Community Memorial Hospital, physicians, acute-care facilities, long-term care facilities, and hospital and clinic laboratories will automatically be integrated into the personal health records of participating Winona citizens. Enrollment is free to all Winona residents—not just Winona Health patients—but enrollees must complete and periodically update a personal health assessment designed by HealthTrac Inc.

Winona Health Online enrollees can securely communicate with their physician via a personal-health Web page; enter and track health information through a record keeper to build a complete family health record; use a guide to prescription and over-the-counter medications; track and manage health-related appointments and activities with a health calendar; and update personal health information from any computer that's connected to the Internet. Data will flow from information systems of hospital and physician groups over high-speed Internet connection to Cerner's server in Kansas City, where data will be stored.

Why Winona? "The critical variables were the size of the community, its progressive hospital and clinic, and its existing high-tech infrastructure," says Gary Evans, CEO of Hiawatha. About 65 percent of Winona residents are active Internet users, compared with 40 percent nationally.

Getting to the Point

Martin's Point Health Care, Maine's largest primary care practice, employs 290 healthcare professionals who serve 45,000 patients at clinics in Portland, Windham and Brunswick, Maine, and in Newington, N.H. More than 17,000 of those are military retirees and active-duty dependants covered through a contract with the Department of Defense (DoD).

Winona Health
Winona, Minn.
Founded 1894 as Winona General Hospital Association
- 99-bed Community Memorial Hospital
- 2 100-bed nursing homes
- 2 assisted living manors
- Home and hospice care

www.winonahealth.org

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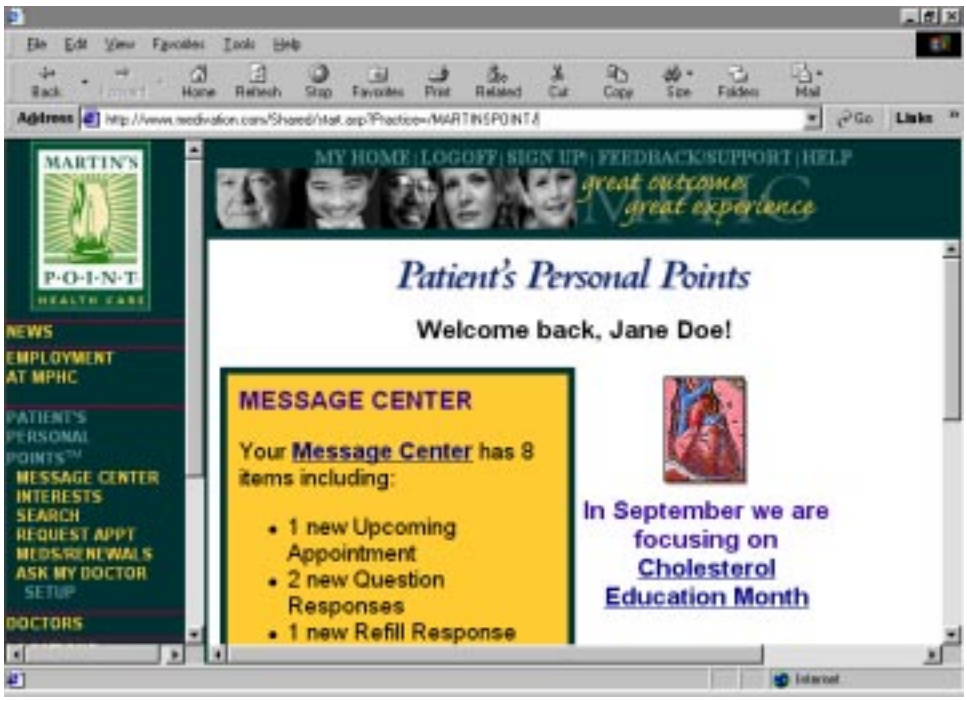
Two years ago, the Health Commons Institute in nearby Falmouth approached Martin's Point about serving as a pilot site for PC-based health-assessment tools. Knee-deep in a practice redesign that included a new centralized call center and an innovative—and fully wired—clinic in Brunswick, the group declined the institute's invitation. "We were in the midst of a top-to-bottom evaluation of how we deliver primary care and make it financially self-supporting," says Janice Wnek, MD, a pediatrician and Martin's Point's medical director. "Income from the DoD contract had helped underwrite the cost of primary care. We completely rethought how patients flow through our practice." Aware that Martin's Point was placing computers on each employees' desk, the institute suggested they contact MediVation, Inc., an application service provider based in Needham, Mass.

Each patient has a secure, personalized Web page through which they can submit non-urgent medical questions, renew prescriptions and make appointments online.

MediVation offers what it calls a secure electronic Provider Patient interface (ePPi). Martin's Point's version is branded as Patient's Personal Points. Each patient has a secure, personalized Web page that can be used to submit non-urgent medical questions, renew prescriptions and make appointments online. Using the system, Martin's Point promises to confirm appointment requests within 24 hours.



Patients with questions are offered the chance to do their own online research through links to Healthwise Knowledgebase, an evidence-based consumer health information database, and to a pharmacy database. A set of instructions offers pointers on how to phrase queries. These outside resources appear to users as part of Martin's Point's Web site. Requests flow through secure messaging and are handled through the nurse triage process.

Martin's Point Health Care
Portland, Maine
Founded 1981
- Employs 290 healthcare professionals
- Operates primary care clinics in Portland, Windham, and Brunswick, Maine, and in Newington, N.H.
- Serves 45,000 patients, including 17,000 military retirees and active-duty dependants through a Department of Defense contract

http://www.martinspoint.org

Three times each day, Martin's Point's IDX practice-management software downloads data into MediVation, cross-referenced by patient and diagnostic codes. MediVation then places relevant content on each patient's Web page, and sends an email message to let the patient know it's there.

"If a patient is scheduled for a blood glucose test, we can send them a message telling them how to prepare for that test and what's likely to happen," Wnek says. "If they were in yesterday with knee pain, we can send them a message suggesting online articles on knee exercises. That takes place automatically in the background."

Martin's Point has been careful to minimize disruption to physicians. "Except for a few who really want it, our physicians are not yet hooked into MediVation," says Wnek. "Our intent in introducing this system was to make it seamless and unobtrusive for the physicians." That means, for example, that online medical questions requiring a physician's response are printed and handed to the doctor.

Wnek says the group has been looking for the right electronic medical record system for four years, and that the strategic plan calls for implementing one within two years, with lab and pharmacy modules coming online in the meantime. "We came close to buying an EMR system, but when we saw it in use at another site we realized it presented a steep learning curve for docs. It also turned out that it couldn't support the claims side of our DoD business."

To date, 2,200 patients have signed up for Patient's Personal Points, and that's without the involvement of the group's Portland clinic, its largest, which comes online in October.

The Web is the Way

Beth Israel and Deaconess Hospitals, two Harvard-affiliated teaching hospitals a quarter-mile apart in Boston's Longwood Medical Area, together with Mt. Auburn, Glover, Nashoba and Waltham hospitals, merged to form CareGroup in 1996. The new system, New England's second largest, faced the challenge of melding incompatible legacy IT systems. The combined institutions were running 146 client-server applications on 7,300 PCs and 173 servers, connected by 25,000 miles of network cable, serving 12,000 employees and 2,000 medical staff.

"Supporting that many applications was cost-restrictive and technologically a nightmare," says John Halamka, MD, CareGroup's CIO and executive director of CareGroup's Center for Quality and Value. "We had two choices. We could build a monolithic data warehouse and dump data from all of the different sources into it. Or we could use Internet- and Web-enabled tools to build a virtual medical record. It quickly became clear to us that the Web is the way." In an intensely competitive market, the organization's need to stem losses and return to profitability heightened the need to demonstrate a return on any investment in new IT strategies.

The Big Five

Stages of Internet Business Development

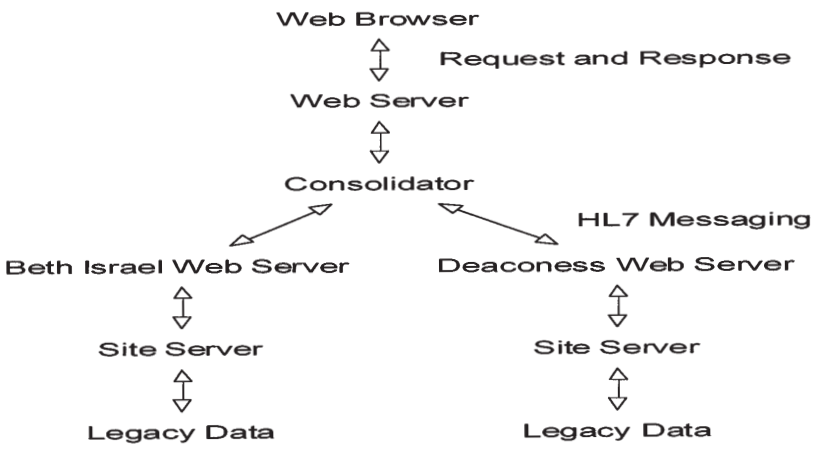
- **Publish.** Build Web presence with customers and employees mainly by publishing static information such as company profiles, marketing information and news.
- **Interact.** Engage the community by providing relevant information and enabling the community to interact with the site and the organization. Features include online provider directories, searchable formularies and interactions with member services departments.
- **Transact.** Deploy robust self-service capabilities and online transactions including online enrollment, appointment scheduling, referral processing, claims submission and electronic prescribing.
- **Integrate.** Pull together the automation of numerous transactions in an effort to automate entire business functions such as online medical management.
- **Transform.** Seamlessly integrate all processes through end-to-end Web-based interactions with customers and business partners, thereby transforming the entire enterprise.

Source: First Consulting Group and Cisco Systems

CareGroup developed a merged medical records system in six months for about $250,000, overcoming the skepticism of executives who were unfamiliar with the Web (this was in 1996) and the reluctance of database administrators to share their data.

CareWeb deploys a unified Internet-based medical-record system. Starting with the emergency departments, which were combined a year after the merger, CareGroup built a Web portal using browsers such as Microsoft Internet Explorer or Netscape Navigator as the ubiquitous way to get at all information. The portal "is the destination for all things IT," Halamka says. "Whether it's a clinical lookup, financial lookup, information guidelines, email, collaboration, you go to home.caregroup.org to do your business."

CareGroup Web Architecture: "Destination for all things IT"



The portal gets three million hits each month, because there is not a single clinical or financial transactional system that is not Web-enabled. Physician resistance is minimized, since training time is less than 10 minutes per doctor—they intuitively know how to click on the "blue links" that allow them to drill down.

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CareGroup ensures security by requiring use of credit-card size SecurID tokens by those seeking access to patient data. Users begin online sessions by entering a user name, a memorized personal identification number (PIN) and the currently displayed passcode from the token, made by RSA Security Inc., of Bedford, Mass. Each minute the tokens generate new passcodes that are synchronized with a code on the system server. The system also maintains a complete log of users who have looked at patient data.

CareGroup's PatientSite offers access to online health information from Healthwise and Multum's prescription information database. "It's credible information, so we don't have to worry about our patients reading a non-controlled study of three people in Bulgaria who ate twice their weight in fish oil and cured cancer," Halamka says. To date, 1,500 patients have online access to their electronic medical records. Multum also has 4,000

CareGroup
Boston
Founded 1996
- 2nd largest integrated delivery system (IDS) in the Northeastern United States
- 6 hospitals, 2,500 providers, 800,000 patients treated annually
- Annual revenues of $1.2 billion
- Provider Service Network is the largest managed care business in the Northeast United States, covering 200,000 lives

http://home.caregroup.org

leaflets written at a sixth-grade level that explain such things as the purpose of a medication, its side effects and when to call a doctor.

E-health tools have produced demonstrated return on investment, according to Halamka. CareGroup saves over $1 million annually from reductions in clinician-search time, patient-admit processing time, the number of admitted patients, the length of hospital stays and time spent in training. Retaining patients and attracting new ones is projected to increase revenues by $3 million to $4 million annually.

CareGroup's Provider Service Network (PSN), a managed care contracting organization, provides central administrative services for more than 1,800 physicians and 200,000 managed care beneficiaries. Its e-health system, PSNWeb, allowed CareGroup to analyze and reduce primary care referrals to hospitals and physicians outside the network, a phenomenon known as "leakage." Within three months, leakage dropped by 25%, resulting in annual savings of $2.7 million.

CareGroup and other area providers have established the non-profit New England Heathcare EDI Network, which links all major providers and payers in Eastern Massachusetts. NEHEN, which now handles 40,000 transactions a day, "is a critical part of CareGroup's response to the Balanced Budget Reconciliation Act, providing us with the infrastructure to check eligibility of our managed care patients and maximize our in-network referrals," says Halamka. "If you show up at one of our hospitals, in two seconds we'll find out if you're eligible for care, your plan code, your member ID and the name of your doctor. In October, the system is adding claims and claims status. NEHEN is saving CareGroup $1 million each year.

In the foreseeable future, Halamka expects that the Web will still rule, but the presentation of the Web will move increasingly to more powerful portable wireless devices. For example, CareGroup's current handheld computers are slower than the modems in most home computers. New devices expected to come into use during the next 18 months will have connections 40 times faster than today's devices.

Riding the Next Wave

Tripler Army Medical Center in Honolulu is the only federal tertiary medical facility in the Pacific Region, which covers 52% of the Earth's surface. The hospital provides advanced medical support for 800,000 people—including members of the three military services, Marines, Coast Guard, military-eligible retirees and families of U.S. veterans and residents of the former Pacific Trust territories.

The Pacific e-Health Innovation Center (P-eIC) at Tripler serves as a technology incubator that conducts research on telemedicine and other e-health initiatives, measures their value, demonstrates their capability within DoD facilities and participates in the transfer of the capabilities to private and public sector agencies. Technology transfers are conducted in accordance with laws enacted in 1986, and typically include a non-monetary exchange of something of value.

Pacific e-Health Innovation Center

Tripler Army Medical Center
Honolulu
Established 1995

- Prototypes, models, demonstrates, and validates emerging technologies

Five product lines:

- Applied E-health
- Research and Concept Exploration
- Distance Learning and Student Mentorship
- E-health Process and Policy Analysis
- E-health Collaborations

http://prpo.tamc.amedd.army.mil/prpo/e-health.cfm

For example, P-eIC is transferring a low-end teleconsultation tool to Texas Children's Hospital in Houston, which will use it to connect its specialists to referral sources in South America, says Army Colonel Rosemary Nelson, the innovation center's program manager and CIO. In return, the hospital will provide P-eIC with documentation, training materials, and lessons learned.

Other e-health initiatives include:

- The Internet Tumor Board, which supports treatment and therapy of cancer patients by expanding communications between specialists at Tripler and medical personnel treating patients across the Western Pacific;
- The Pacific Medical Network (PacMedNet), which provides secure, Web browser-enabled remote access to health information history on demand, presenting a consistent computer-based patient record;
- The Theater Telemedicine Prototyping Project (T2P2), which allows primary care managers at outlying facilities to consult electronically with specialists at Tripler regarding the management of patients with dermatology and orthopedic conditions; and
- The Island-Wide Women's Health Project, designed to create a universal Obstetric/Gynecology-specific electronic patient record for the entire U.S. Army and U.S. Navy patient population on the island of Oahu. The project will also seek to demonstrate the feasibility of remote image technologies for the delivery of women's healthcare.

For e-health tools to make it from idea to implementation, Nelson stresses the importance of having a clinical champion who believes in the technology and will shepherd it through development. She also cautions that there must be a clear understanding of the amount of resources and effort needed to sustain a technology once it is deployed.

Conclusions

Several lessons emerge from these case studies. Introducing e-health tools in a series of steps, rather than all at once, can ease the transition. Typically, electronic medical records, which represent the most profound change, are left as the last piece of the puzzle. Workflow procedures can be introduced in doable doses, easing acceptance of later pieces.

E-health tools such as those used at Tripler Army Medical Center can provide access to specialists' expertise to patients in remote areas. Such access intellectually stimulates specialists by enabling access to patients with rare conditions and diseases. Involve interested physicians as pilot users of new tools, to work out kinks and serve as clinical champions. This can ease transitions for other physicians.

E-health as an approach is here to stay, but the particular tools that underlie it will evolve quickly. Bandwidth is expanding steadily and wireless devices are becoming more sophisticated. As new technologies emerge, incubators such as P-eIC help winnow and develop those that hold the most promise. As always, data confidentiality is crucial. While technical tools to assure confidentiality exist, the greater challenge is building users' confidence in these tools.

During the fourth quarter, we will be sending the following special mailings to member CEOs and CIOs:

- An announcement of the IT Benchmarking program, through which you will be able to compare your Information Management costs, services, application portfolios and human resources with others'. The objective of this program will be to identify leading practices and lessons learned in achieving them, as well as to create Affinity Groups of similar organizations for ongoing collaboration. We would like every member to take advantage of this program in the fourth quarter.
- The introduction of a business case tool and approach for IT investment planning and the related value realization. Like the benchmarking program, there is no cost to adopting and using this tool. Each user should simply share their final business case, so that others can avoid reinventing business cases from scratch.
- A reminder about the IT Performance Measurement initiative, already available, which will give you an overview of your IT performance at the organizational level, and validate your current priorities and provide for sharing of leading practices.

For information about these or other programs, please contact our office. We look forward to the results of each of these important programs.