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The Dubious Promise of Digital Medicine

GE, Google, and others, in a stimulus-fueled frenzy, are piling into the business. But electronic health records have a dubious history

By Chad Terhune, Keith Epstein and Catherine Arnst

Neal Patterson likens the current scramble in health information technology to the 19th century land rush that opened his native Oklahoma to homesteaders. Cerner (CERN), the large medical vendor Patterson heads, is jockeying for new business spurred by a $19.6 billion federal initiative to computerize a health system buried in paper. "It's a beautiful opportunity for us," the CEO says.

The billions in taxpayer funds—part of the $787 billion economic stimulus—also have energized tech titans General Electric (GE), Intel (INTC), and IBM (IBM), all of which are challenging Cerner and other traditional medical suppliers. Microsoft (MSFT) and Google (GOOG) aim to put medical records in the hands of patients via the Web. Wal-Mart (WMT) is teaming with computer maker Dell (DELL) and digital vendor eClinicalWorks to sell information technology to doctors through Sam's Club stores.

Under the federal stimulus program enacted in February, hospitals can seek several million dollars apiece for tech purchases over the next five years. Individual physicians can receive up to $44,000. These carrots should encourage the proliferation of technology that will computerize physician orders, automate dispensing of drugs, and digitally store patient records. If providers participate broadly, those files are supposed to be accessible no matter where a consumer goes for treatment. President Barack Obama says the changes will improve care, eliminate errors, and eventually save billions of dollars a year. There's also a stick: The federal government will cut Medicare reimbursement for hospitals and medical practices that don't go electronic by 2015.

The incentives are working. R. Andrew Eckert, CEO of tech provider Eclipsys, says one client, a 250-bed hospital that shelved a software order in the fall after losing $50 million in the stock market, has reinstated the order. The move is "100% due to the stimulus," says Eckert (who won't name the hospital). Brandon Savage, chief medical officer at GE's health unit, says his company's technology will leapfrog the competition by not just replacing paper but also guiding doctors to the best, least-costly treatments.

In Washington, where partisan bickering over how to revive the economy flares on several fronts, sweet consensus reigns on health-tech spending. Congressional Republicans sound just as enthusiastic as the White House. Encouraged by former House Speaker Newt Gingrich, now an influential industry consultant, lawmakers cheer electronic records as a business-based remedy for much that ails medical care.

HIGH COST, QUESTIONABLE QUALITY

That rare agreement, however, is obscuring the checkered history of computerized medical files and drowning out legitimate questions about their effectiveness. Cerner, based in Kansas City, Mo., and other industry leaders are pushing expensive systems with serious shortcomings, some doctors say. The high cost and questionable quality of products currently on the market are important reasons why barely 1 in 50 hospitals has a

comprehensive electronic records system, according to a study published in March in the *New England Journal of Medicine*. Only 17% of physicians use any type of electronic records.

Hospitals and medical practices that plugged in early have experienced pricey setbacks and serious computer errors. Suddenly dumping more money on hospitals, which will then funnel the cash to tech vendors, won't necessarily improve the situation, say many doctors and administrators.

Studies have shown that some large networks, such as the Veterans Administration and the Kaiser Permanente system, based in Oakland, Calif., have used electronic records to help cut costs and improve care. But so far there's little conclusive evidence that computerizing all of medicine will yield significant savings. And improvements to patient care may be modest. An analysis of four years of Medicare data published in March in the scholarly journal *Health Affairs* found only marginal improvement in patient safety due to electronic records —specifically, the avoidance of two infections a year at the average U.S. hospital. "Health IT's true value remains uncertain," wrote Stephen Parente and Jeffrey McCullough, researchers at the University of Minnesota.

Part of the problem stems from a fundamental tension. Info tech companies want to sell mass-produced software. But officials at large hospitals say such systems, once installed, require time-consuming and costly customization. The alterations often make it difficult for different hospitals and medical offices to share data—a key goal. Meantime, the health IT industry has successfully lobbied against government oversight.

"Most big health IT projects have been clear disasters," says Dr. David Kibbe, senior technology adviser to the American Academy of Family Physicians. "This [digital push] is a microcosm for health-care reform....Will the narrow special interests win out over the public good?"

OVERLOOKING RED FLAGS

Britain's experience shows that technology alone doesn't offer an automatic advantage. An $18.6 billion initiative to digitize Britain's government-run health system is four years behind schedule because of software snafus and vendor troubles. Few British doctors have been able to use electronic records, and there's little proof that they have saved money or helped patients. "There is a belief that technology solves all of our problems," says Ross Koppel, a sociologist at the University of Pennsylvania School of Medicine. "[But] more data does not equate to better medical care."

Administration officials insist they are proceeding cautiously and will learn from any missteps. But red flags raised by doctors and researchers haven't gotten much attention in Washington, in part because the health-tech industry has forged strong ties to the President, his top medical advisers, and Republican heavyweights such as Gingrich.

Nancy-Ann DeParle, the new White House health-reform czar, recently stepped down after eight years as a member of Cerner's board of directors. A former administrator of Medicare and Medicaid during the Clinton Administration, DeParle worked from 2006 through 2008 as a managing director at CCMP Capital Advisors, a private equity firm that invests in health-care businesses. She has sold shares in Cerner for about $950,000 and is disposing of investments related to CCMP, according to the White House.

DeParle declined to comment. Obama spokeswoman Linda Douglass says DeParle will delegate any decisions related to Cerner to a subordinate. "She is not going to be involved in implementing health IT," Douglass adds. Cerner CEO Patterson says DeParle's ascension won't benefit his company, which had $1.7 billion in revenue in 2008. "I think that actually works to our disadvantage," he argues. "I'm not sure I'll even be able to talk with her

now."

Glen Tullman, CEO of Allscripts-Misys (MDRX) Healthcare Solutions, a big Chicago vendor to doctors, became acquainted with Obama when he ran for the Senate in 2004. The pair worked out at the same Chicago gym and occasionally played basketball. At that time, Tullman gave Obama a personal demonstration of his company's software at Allscripts' headquarters and went on to serve on Obama's Presidential campaign finance committee. "I feel fortunate that before he became President we had the opportunity to help him better understand the value of electronic health records as a necessary condition to fixing health care," Tullman says.

Shortly after the stimulus became law two months ago, Tullman and Gingrich hosted a Webcast for thousands of hospital officials and doctors promoting the financial incentives. Since then, Tullman has worked with a client, the University of South Florida Health system in Tampa, to seek $15 million in stimulus money to hire 130 e-health "ambassadors" who would pass out free samples of Allscripts' prescribing software to physicians. If the funding comes through, the $50,000-a-year representatives would receive a two-week training course from Allscripts, though the marketers otherwise are supposed to be independent of the company.

"This is all about getting doctors moving and considering an electronic health record," Tullman says. "The market is so big, we will get our fair share." U.S. Representative Kathy Castor, a Tampa Democrat, is helping. She has brought the Allscripts proposal to the attention of officials at the U.S. Health & Human Services Dept. whose job it is to dole out the tech incentives. Castor says the program will create good jobs during a recession.

Allscripts' rivals want their share, too. Lobbyists for McKesson (MCK), a large medical supplier based in San Francisco that already generates $3 billion a year in health technology sales, are distributing a position paper to members of Congress and Administration officials that could help steer stimulus dollars toward the company. The document, reviewed by *BusinessWeek*, addresses the definition of "meaningful use" of electronic records. That is the standard Congress set for hospitals and doctors seeking incentive money; it is now up to the Obama Administration to refine the term. The McKesson paper urges a requirement that recipients "build on existing technologies"—language that could favor products of McKesson and other established vendors.

Dr. David Blumenthal, the new head of health tech at HHS, will play a big role in fine-tuning this language. Formerly director of the Institute for Health Policy at Harvard Medical School, he declined to comment. HHS spokesman Nicholas Papas says: "Health IT has the potential to save the federal government more than $12 billion over 10 years, improve the quality of care, and make our health-care system more efficient. We have work to do to achieve this potential... and we will ensure that everyone has a seat at the table." McKesson says it's just trying to speed the process. "Our big message is: 'Please do this quickly. Uncertainty creates a slowdown,' " says Ann Richardson Berkey, senior vice-president for government strategy.

There are potential benefits to patients and taxpayers if the promise of electronic medical records can be fulfilled. In theory, a computer screen can supplant reams of paper and offer instant access to patient histories, dangerous drug interactions, and allergies. Treatment of diabetes, cancer, and other illnesses can be tracked more effectively.

SPIKES IN PHARMACY ERRORS

Geisinger Health System in Danville, Pa., wanted all that when it spent $35 million to purchase and install software from Epic Systems, a large vendor in Verona, Wis. But in June 2005, during a pilot run of a computerized order-entry system at Geisinger's flagship medical center, errors began appearing at a rate of several a week in the hospital's psychiatric unit. "The pharmacy would interpret an order as one drug at one

dosage, and the patients were ordered the wrong medications at different dosages," recalls Jean Adams, a nurse in charge of the IT team. Fortunately, astute staffers discovered the problem after a few weeks and began verifying the computer drug orders using the phone. Full implementation of the Epic system was put on hold. Adams says Geisinger traced the trouble to incompatibility between a common pharmacy database and Epic's system.

Epic CEO Judith Faulkner says the episode at Geisinger, and similar incidents at other hospitals, taught her company that physician orders and pharmacy records cannot use distinct technologies. "It doesn't work when you mix and match vendors," Faulkner says. "It has to be one system, or it can be dangerous for patients."

To resolve its problem, Geisinger spent an additional $2 million on fixes that took 18 months, according to Dr. James M. Walker, the hospital chain's chief health information officer. An internist and former minister, Walker is one of health technology's best-known advocates. Tech boosters frequently cite Geisinger as an illustration of IT's sunny future. But Walker concedes that the stimulus-fueled rush to adopt existing technology could cause other providers to suffer through expensive fixes with potentially harmful consequences for patients. Vendors such as Epic, Walker says, sell relatively rudimentary electronic tools and expect hospitals and doctors to assure accuracy and safety. "This can be very tricky," Walker adds. "A lot of us are trying to say: 'Look, let's slow down.' "

NO WAY TO REPORT PROBLEMS

The Joint Commission, a nonprofit group that inspects and accredits 15,000 health-care organizations, has expressed similar caution. The commission, based in Oakbrook Terrace, Ill., issued a warning in December about problems with complex health-tech systems. It cited one U.S. pharmaceutical database that found 43,372 medication mistakes, or about 25% of the total reported in 2006, involved computer technology. The problems included flaws in data entry, inadequate software, and confusing screens.

Koppel, the researcher at Penn, has sounded some of the loudest alarms. In 2005 he published a study in *The Journal of the American Medical Association* that examined an Eclipsys system at the university's academic hospital. He found that use of computers introduced 22 new types of medication errors. His goal was to discover why young medical interns make so many errors. He hypothesized that long hours were to blame. To his surprise, the problems stemmed mostly from software installed to prevent mistakes.

Eclipsys CEO Eckert says Koppel's study examined a technology that has been updated. "The industry has grown up," he says. "There are months of testing by the client and us before someone activates a system."

When health technology fails for one medical provider, there is no central mechanism for reporting problems to others who use it. The federal government collects and disseminates this kind of information on drugs and medical devices. But tech contracts routinely bar medical providers from disclosing systemic flaws. Koppel contends this is unethical and risky: "We need to collect what we know and head off [any potential] tragedy."

Companies counter that confidentiality agreements protect their proprietary technology and that privacy laws prevent disclosure of patient and physician information without consent. "To the extent we are required to report information, or are allowed to, we would, of course, like to do that," says Allscripts CEO Tullman. He compares the skeptics of health info tech to doctors who questioned the introduction of the stethoscope in the 19th century: "There have been Luddites in every industry."

Disputes over health-tech failures are often resolved in private, making them difficult to sort out. Seattle

Children's Hospital sued Eclipsys in 2002, claiming the company missed installation deadlines and failed to fix software errors. This resulted in "sizeable cost overruns and delays," the suit alleged. Eclipsys and the hospital reached a confidential settlement in 2003. A spokeswoman for Eclipsys says "isolated problems in Seattle don't reflect our company's overall success. Every vendor in the industry has had accounts with implementation issues."

"That was a bad marriage," says Dr. Mark Del Beccaro, chief medical information officer at Seattle Children's Hospital. "It taught us to get a better prenuptial agreement next time." The hospital turned to Cerner for a new system, but Del Beccaro soon became troubled by incidents of children suffering medication overdoses despite alerts from the Cerner software. He asked the doctors involved whether they had seen the alerts onscreen. "They told me, 'I get so many alerts, I click through [them],' " Del Beccaro says. "They do become mind-numbing."

"Alert fatigue" is a common concern at hospitals. The Joint Commission, in its December bulletin, warned about doctors and nurses overriding them and impairing patient safety. At Seattle Children's, Del Beccaro says, it took considerable effort to reduce online warnings. "There are definitely times Cerner could be more responsive to our problems, but we are pretty happy with them," he says.

Children's National Medical Center in Washington, D.C., has had a similar experience. In 2006 doctors and nurses there say they discovered an eightfold increase in dosage errors for high-risk medications. They attributed the trend to a Cerner system installed six months earlier. The mistakes were caught, and no patients were harmed, according to the center. But the hospital reverted to a process using paper notes. "I felt betrayed by a system I was supposed to trust," says Cherise Aldridge, a neonatal intensive-care nurse.

For three years, Cerner has resisted making adjustments to its software, which cost the Children's Center $30 million, says Linda Talley, the hospital's director of nursing systems. Today nurses use the Cerner network in combination with one assembled by the hospital's tech department. Nurses retype drug dosages, babies' weights, and other information from the Cerner computer into the homemade system to double-check how much medicine to administer. This time-consuming process has brought the dosage-error rate back down, says Talley. But she warns that other hospitals use the Cerner system without a backstop like the one her institution cobbled together.

Dick Flanigan, a senior vice-president at Cerner, says the company responds swiftly to requests for improvements and is "absolutely focused on making systems as safe and effective as possible." There are divergent opinions as to which technology works best, he adds. Cerner has developed a more expensive system that uses bar codes for medication and is capable of better integrating a wide array of data, he says. "We are flexible on this, and at times we incorporate what is done by the client." CEO Patterson adds that hospitals "are much safer [with Cerner technology] than without it."

The company faced more questions over its technology at the University of Pittsburgh Medical Center (UPMC). In 2005 researchers there found that at the university's Children's Hospital, patient deaths more than doubled, to 6.6% of intensive-care admissions, in the five months following the installation of a computerized order-entry system. The research on child patient deaths at the University of Pittsburgh found a "direct association between [computerized records] and increased mortality," according to an article published in December 2005 in the medical journal *Pediatrics*. Digital technology slowed treatment in several ways, the researchers concluded. One example: Doctors and nurses in the intensive-care unit were accustomed to ordering medications and tests while a sick child was en route to the hospital. The Cerner system required that orders be submitted only when the

patient arrived, costing crucial time. The authors of the *Pediatrics* article acknowledged that their work clashed with other studies showing that digitization decreases errors and shortens hospital stays.

G. Daniel Martich, chief medical information officer at UPMC, says the *Pediatrics* study was flawed. Factors other than the installation of computers, such as the centralization of pharmacy services, also disrupted care, he emphasizes. The problems identified in the 2005 paper have all been resolved, Martich adds. "There were workflow issues," he says. "We learned the hard way because we were pioneers." Over the long run, he says, technology has helped decrease mortality rates and cut medication errors in half at Children's Hospital since 2003 .

CURSORY PRODUCT TESTING

Cerner CEO Patterson says the 2005 Pittsburgh study "certainly got our attention" and prompted an internal review. But that inquiry and others since have found no pattern of ill effects, he says. "We have more clients doing more orders than anybody," Patterson says. "If I had a systemic problem, you'd be reading about it on the front page."

The U.S. Food & Drug Administration has been considering whether to regulate health technology in the manner it oversees medication and implants. That decision now falls to the Obama Administration, which faces opposition from industry groups arguing that additional red tape would impede adoption of helpful technology.

Companies are lobbying the Administration to keep product-testing and standard-setting within the sole jurisdiction of a nonprofit body called the Certification Commission for Healthcare Information Technology. Founded in 2004 with industry money and grants from nonprofits, CCHIT has received $2.5 million a year under a contract with the federal government. The other half of CCHIT's $5 million budget comes from fees paid by companies.

Mark Leavitt, chairman of CCHIT, is a former tech vendor. He sold his electronic health-records company to GE (GE) in 2002 and later became chief medical officer of the Healthcare Information & Management Systems Society, a trade group in Chicago. Seven of the CCHIT's 19 voting members work for vendors or for-profit tech consulting firms. "We try to strike a fair balance between medical providers and vendors," Leavitt says. "People need to trust what we do."

But another commissioner at the CCHIT, Michael L. Kappel, the senior vice-president for government and industry relations at McKesson Technology Solutions, acknowledges that preserving purely private-sector oversight will be tough in the wake of the financial crisis. "I'm having a hard time with this issue because people read about these financial companies, and there is a feeling that government lacks enough regulation," Kappel says. But regulating health info tech "is a recipe for disaster," he adds. "I am very sensitive to criticism that [CCHIT] is vendor-dominated. That couldn't be further from the truth."

Blumenthal, the new Obama health-tech chief, declined to comment on CCHIT. But in an article published this month in the *New England Journal of Medicine*, he said the body needs to set stricter standards: "Many certified [electronic health records] are neither user-friendly nor designed to meet [the stimulus law's] ambitious goal of improving quality and efficiency in the health-care system."

Sharona Hoffman, a professor of law and bioethics at Case Western Reserve University in Cleveland, says CCHIT's product testing, typically completed in a single day, isn't rigorous enough. In an article last December in the *Harvard Journal of Law & Technology*, she and a co-author faulted the group for telling vendors the testing

scenarios in advance and for not conducting ongoing monitoring. Without better oversight, she argues, hospitals and doctors probably will not spend their stimulus money wisely.

Barry Hendrix, a primary-care physician in Paragould, Ark., says he paid dearly for just such a mistake, wasting $100,000 on an electronic records system. "It was a complete disaster," he says of the equipment he bought from NextGen in 2005 and abandoned within months. The system generated patient notes with stray asterisks and other gibberish, he says, and it didn't work properly with NextGen's billing software. Hendrix says he couldn't get technical support from the company or its authorized reseller. NextGen, a unit of Quality Systems (QSII) in Horsham, Pa., counters that Hendrix is a rare exception among thousands of loyal customers. It adds that it has terminated the reseller that served him.

Hendrix, however, has advice for doctors looking to go electronic: "Never believe a slick salesman."

Editor's Note: "The Dubious Promise of Digital Medicine" gave erroneous contract and budget figures for the Certification Commission for Healthcare Information Technology. The group has received $2.5 million annually under a three-year contract with the federal government; its annual budget is $5 million.

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Obama's Point Man on Health IT Weighs In

Businesses angling for a share of federal health- technology stimulus money will want to study an Apr. 9 *New England Journal of Medicine* article written by the new Obama Administration health info tech overseer, David Blumenthal. Overall, "Stimulating the Adoption of Health Information Technology" conveys a strong sense of caution. "Huge challenges await," Blumenthal writes.

To read the full *NEJM* piece, go to http://bx.businessweek.com/health-information-technology/reference/

Terhune is a senior writer for BusinessWeek based in Florida. Epstein is a correspondent in BusinessWeek's Washington bureau. Arnst is a senior writer for BusinessWeek based in New York.