The Digital Health Care Revolution?

By Kyna Fong and Jonathan Levin

Will information technology transform the health care sector the way it has transformed other major sectors of the U.S. economy? Many of the core ideas advocated by health care reformers are premised on patients, physicians, and health care organizations having access to complete electronic medical records (EMRs). These systems should facilitate identifying best practices to improve quality of care, initiatives to pay for value rather than volume, and efforts to help patients make informed choices and participate actively in their care. Each of these activities appears to be strongly complementary to the widespread and successful adoption of modern information technology.

Progress in this direction has been halting, however, particularly among office-based physicians who historically have worked in a cottage industry

of small practices. Unlike in hospitals or large health care systems where administrators can mandate the use of EMRs, efforts to encourage autonomous physicians to adopt these systems have met fierce resistance. That poses an enormous roadblock given that the millions of office-based visits each day constitute 40 percent of spending on medical care and, more importantly, much of the longitudinal, point-of-care data needed to understand treatment patterns and health outcomes.

The enactment of the HITECH Act of 2009, part of the American Recovery and Reinvestment Act (aka the stimulus bill), signaled a major shift in public policy. This legislation provides incentive payments for "meaningful use" of certified EMR systems, and

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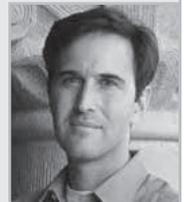
later, penalties for not using them. The logic for the policy is straightforward. Digitized records have many "public good" benefits such as fewer duplicated tests, portable patient records, automated clinical decision support to reduce medical errors, and improved communication among providers and between providers and patients. Since many of those benefits do not accrue to physicians directly but rather to society as a whole, the government subsidies are meant to compensate physicians for the substantial investments needed to transition to electronic records.

The Impact on Adoption

At first glance, widespread adoption of EMRs by office-based physicians appears to be becoming a reality (see Figure 1). In 2010, the National Ambulatory Medical Care Survey reported that 50.7 percent of physicians are "using an EMR system," an incredible jump from just 29.2 percent in 2006. The numbers, however, deserve a closer look.

First consider how the government has defined "adoption." The answer has two parts: certification of the EMR system and meaningful use by the physician. Certification requires that the EMR offer a laundry list of features such as e-prescribing, computerized order entry, electronic display of lab results, etc. Meaningful use spells out requirements for how physicians must use the system. Current requirements include basic tasks such as electronically maintaining active medication, allergy, and problem lists for at least 80 percent of patients and providing patients with clinical summaries for each visit, but they do not yet insist on physicians electronically documenting clinical notes, let alone allowing patients to have a comprehensive "portable" record to carry with them or have available in an emergency.

Comparing the survey numbers with the government's definition is a sobering exercise. Of the 50.7 percent of physicians reportedly using EMRs, slightly less than half (24.9 percent) have even a "basic system" that potentially might qualify for certification. Only 10.1 percent

Figure 1.

Percentage of Office-Based Physicians With Electronic Medical Records/Electronic Health Records (EMRs/EHRs): United States, 2001–2009 and Preliminary 2010
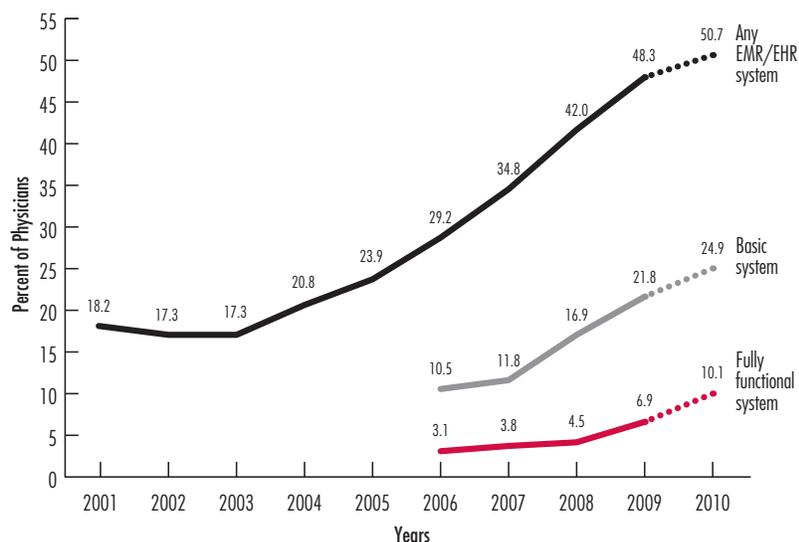
Notes: Any EMR/EJR is a medical or health record system that is either all or partially electronic (excluding systems solely for billing). The 2010 data are preliminary estimates (as shown by dashed lines), based only on the mail survey. Estimates through 2009 include additional physicians sampled from community health centers; prior 2008 combined estimates were revised to include those physicians (4). Estimates of basic and fully functional systems prior to 2006 could not be computed because some items were not collected in the survey. Fully functional systems are a subset of basic systems. Some of the increase in fully functional systems between 2009 and 2010 may be related to a change in survey instruments and definitions of fully functional systems between 2009 and 2010 (see Table for more details). Includes nonfederal, office-based physicians. Excludes radiologists, anesthesiologists, and pathologists. Source: CDC/NCHS, National Ambulatory Medical Care Survey.

of physicians have a "fully functional" system, and even if all these become certified, the physicians who have them may not meet the requirements for meaningful use. From firsthand accounts, there are physicians who pay for fully functional systems but enter patient information into the system only once per quarter or even per year. That is a far cry from meaningful use.

The Congressional Budget Office (CBO) also has estimated EMR adoption to assess the budgetary impact of the HITECH Act.[1] It estimates that in 2015 when the window closes for physicians to receive incentive payment, somewhere between 21 percent and 53 percent of physicians will demonstrate meaningful use of EMR systems. The CBO estimates that in 2019, well into the period physicians are facing penalties for non-adoption, the range will be 36 percent to 70 percent. Strikingly, in the CBO's low-adoption scenario, instead of exhausting the $20 billion set aside in the HITECH Act for incentive payments, the government will realize a net gain of $2.5 billion from non-adoption penalties!

The most recent data on incentive payments (July 2011) tells us that $150-$200 million has been paid out to physicians and hospitals for meaningful use so far in 2011, roughly in line with the CBO full-year estimates of $400 million to $1.1 billion. And in a recent survey only 41 percent of physicians surveyed expected to even apply for meaningful use incentive payments.

Why Aren't Physicians Adopting IT?

The big question is why physicians aren't adopting electronic medical records.

A major issue is the cost of transitioning to electronic records. A slew of low-priced systems entering the market has lowered the direct financial cost. But significant time costs for training and implementation, and work slow-downs following implementation, remain a significant barrier. Often practices are asked to cut their patient load to 50 percent for several weeks during implementation and slowly build back up. Especially among primary care physician practices, productivity can remain 10 percent to 20 percent below pre-implementation levels even years afterwards.[2] Such a

decrease for even one year easily can offset the maximum total of $44,000 in incentive payments that the government is offering, making the decision to invest in health IT unattractive for smaller organizations.

Is the answer larger subsidies? Not likely. Much of the resistance voiced by physicians toward EMRs comes across as a broader hostility to the technology itself. This is sometimes interpreted by observers as evidence that physicians are resistant to all new technology, an odd claim given the simultaneous charge that physicians are only too eager to use the latest MRIs, CT scanners, stents, etc. A more compelling explanation is that existing EMR systems often do not make physicians' lives easier, nor is there strong evidence that the systems significantly improve patient care.

Much of the physician frustration around EMR systems stems from poor usability and interface design. Most EMR systems were developed initially as enterprise software and originated as billing and administrative systems. Clinician usability was not the central concern and the result is often archaic systems that

1 "Medicare and Medicaid Programs; Electronic Health Record Incentive Program; Final Rule," *Federal Register* 75 (July 28, 2010): 44314-44588. Print.

2 Samaan, Zeina et al., "The Impact of the Electronic Health Record on an Academic Pediatric Primary Care Center," *Journal of Ambulatory Care Management* 32.3 (2009): 180-187. Print.

require weeks of training and are plagued by manual workarounds.

A useful counterpoint is the aviation industry, where countless R&D hours have been spent designing pilot cockpits to ensure that when a pilot needs to get information or take an action, the ability is immediately and intuitively available to her so that she can focus on keeping passengers safe rather than on deciphering which button to click. The same is not true in physician offices. Instead, examples abound of physicians being hindered from performing basic tasks within an EMR: A 2010 study found that medical students, who have grown up in the era of Facebook and Google, had difficulty finding critical patient information inside an EMR.[3]

This frustration might be forgiven if there were strong evidence that EMR systems were improving patient care. So far, however, the evidence is rather weak. Take the case of electronic prescriptions, which seem like a slam-dunk candidate for digitization given the plethora of medication errors that happen every day. A recent study found that electronic prescriptions are carrying the same error rates as handwritten orders.[4] And a broader study of Medicare claims data found that for average patients, the outcomes for common hospital admissions such as heart attacks and pneumonia are not improved by health IT.[5]

Finally, even as physicians and hospitals move toward electronic records, there is no guarantee that the systems they install will be interoperable or that health data will be regularly shared and aggregated. The HITECH Act does envision a national health information network, but such an effort faces multiple hurdles. Data sharing requires standardization and is complicated by privacy concerns. Moreover, many hospitals and health care systems view their clinical data as proprietary information and might hesitate to invest in interoperability that would benefit their competitors. Early attempts to create health information exchanges have mostly been at small scale and have enjoyed only modest success.

With these points in mind, it is not surprising that many of the most successful stories about health information technology have come from large integrated health care systems such as Kaiser Permanente. These systems have the scale to spend billions of dollars on customized EMR systems and the organizational structure to take advantage of some of the "public good" benefits of digitized patient records. For example, a touted benefit of Kaiser's EMR system is that it has reduced office visits by substituting secure patient-provider messaging. This benefit is less likely to be realized in an environment where individual physicians or practices have incomplete electronic data or receive insurer payments only upon seeing patients in the office.

What Happens Next?

Despite the rather distressing picture we have painted, a number of powerful factors apart from the HITECH incentives are converging to upset the status quo. Shifts in payment systems and health organizations seem likely to push strongly toward EMR

3 Wilson, Linda, "Med students not ready to use EHRs: Study," ModernPhysician.com, January 25, 2010. Web.

4 Nanji, Karen, et al., "Errors associated with outpatient computerized prescribing systems," *J Am Med Inform Association,* (June 29, 2011). Web.

5 McCoullough, Jeffrey, Stephen Parente, and Robert Town, "The Impact of Health Information Technology on Patient Outcomes," University of Minnesota Working Paper, March 2011. Print.

adoptions. Soon, simply getting paid by insurance companies may require supplemental clinical data that only electronic records can reasonably support. The expansion of pay-for-performance programs and contracting entities such as accountable care organizations are another strong push toward health IT.

Furthermore, both physicians and patients are starting to see value in EMR systems. For physicians, having access to a patient's chart at 2 a.m., being able to send automated care reminders to patients, receiving lab results instantly, and being able to trend them effortlessly are useful and students going through medical school today will simply expect those capabilities. For patients, the ability to communicate with physicians or learn quickly about test results likely will come to be expected as well. Already the convenience of its IT system has become a centerpiece of Kaiser's marketing campaigns to attract members.

There is also little disagreement that if implemented well, health IT can improve patient care and the overall efficiency of the health care system. The danger is that it will not be done well. In our view, physician recalcitrance should be viewed as an important signal that the market still needs usable IT products that are desirable to physicians and patients; for this reason one of the most promising outcomes of the HITECH Act is that it seems to have stimulated substantial innovation of new EMR products and systems.

Health care is certain to undergo a digital transformation in the near future. Let's hope that the outcome involves technology that helps rather than hinders physicians, since ultimately it is we as patients who suffer the consequences when our doctors sit mystified by their EMR.

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