Taking Advantage of Health IT: Part 1

Here's how to apply new technology, care collaboration, and telemedicine.

BY KEN TERRY

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Editor's Note: *In part 1 of this two-part article, the author explores the long-term potential of Health IT, the challenges of EHR, and the current status of information interoperability. Part 2 will discuss care collaboration and telemedicine.*

Population health management (PHM) depends largely on health IT. By aggregating and analyzing data from multiple sources, PHM software can supply actionable information to providers and care managers so that they can intervene with individual patients at the right time and in the right place. Moreover, timely data on resource utilization and population health enables risk-bearing groups and accountable care organizations (ACOs) to take appropriate actions so they don't exceed their budgets.

Despite physicians' justifiable issues with EHRs, there is reason for optimism about the long-term potential of health IT. EHRs will become more usable and useful. Interoperability between EHRs will become real as technical barriers fall. Online collaboration among providers caring for the same patients will improve chronic care. Telehealth and remote patient monitoring will eliminate geographical distance and patient mobility as obstacles to high-quality, timely care.[1] Mobile health apps will enable providers to track chronically ill patients continuously. Artificial intelligence will expand the boundaries of what is possible in healthcare.

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All of this is on the horizon or starting to happen already. By the time the physician-led reform model could conceivably be implemented, the building blocks of the technological future will be in place. At that point, these health IT tools can be expected to have an enormous impact on care delivery and the resources required to manage population health.

Electronic health records have hampered many physicians and reduced their productivity. On the other hand, EHRs also have digitized healthcare information so that it can be

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analyzed and used to improve quality and manage population health. This is the tradeoff at the heart of the EHR debate: Healthcare transformation requires data, but EHRs must be transformed to make them easier to use and more effective in patient care.

The current situation is appalling. Primary care physicians spend only 27% of a typical day in direct contact with patients, according to a 2016 study. Almost half of their day is consumed by administrative activities, and 37% of physician time in the exam room is spent on EHR and desk work.[2] Another study found that family physicians spend twice as much time on EHR tasks as they do on direct patient care. They also work in the EHR at home an hour or two each day.[3]

EHR documentation has been singled out as particularly grueling. The standard EHR comes with numerous templates that, in essence, program the doctor to follow certain processes and ask particular questions, often to satisfy the billing requirements of Medicare and private payers. These templates include dropdowns with boxes that must be checked off at every step. Documentation by exception is possible in some areas, such as the review of systems. Also, physicians dictate some portions of the note, often with the aid of voice recognition software. But overall, data entry is challenging. It competes with doctors' thought processes, limits their engagement with patients during physical exams, and reduces the amount of personal time available to them.

EHRs also generate text that is often difficult to read, making it challenging for doctors to locate relevant information. In addition, some physicians pull past notes into current notes to speed up documentation. That adds to the "note bloat" that so many doctors have decried because it produces overlong and opaque notes.

Payer requirements to measure quality have added to the burden on clinicians and their staffs. According to a 2017 survey of nearly 1500 practices, mandated quality reports under the federal government's EHR incentive program—popularly known as "Meaningful Use"—didn't necessarily support quality improvement, but they did increase work. "Practices reported numerous challenges in generating adequate reports," the researchers noted.[4]

Fixing Electronic Health Records

Many proposals have been made to improve the usability of EHRs. In a *Harvard Business Review* article, Robert Wachter, MD, a professor and Chairman of the Department of Medicine at the University of California at San Francisco, and Jeff Goldsmith, a health policy expert, said that for EHRs to become truly useful tools, a "revolution in usability" is needed. Patient care, rather than billing, should be the central focus, they argued.

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All team members should be able to add their own observations of changes in the patient's condition, the actions they've taken, and the questions they are trying to address. It should be easy for clinicians starting shifts or joining the team as consultants to see what's going on.[5]

Similarly, the American Medical Association and the RAND Corporation, in a 2014 study of EHR usability, proposed that EHRs be redesigned to support team-based care and promote care coordination. Their six other recommendations[6] were that EHRs:

- Enhance physicians' ability to provide high-quality patient care;
- Offer product modularity and configurability;
- Reduce cognitive workload;
- Promote data liquidity;
- Facilitate digital and mobile patient engagement; and
- Expedite user input into product design and post-implementation feedback.

Despite these and other proposals, however, there has been little discernible progress in improving EHRs. One reason is the continuing dominance of fee for service, which requires the documentation of each service provided. Innovation has also been hampered by the need of EHR vendors to comply with regulatory requirements. During the Meaningful Use era, for example, software development focused on meeting government certification criteria.[7]

More recently, the Office of the National Coordinator for Health IT, as a condition of EHR certification, has begun requiring developers to integrate an application programming interface (API) based on the Fast Health Interoperability Resources (FHIR) standard.[8]

On the positive side, CMS recently changed its documentation requirements for evaluation and management (E&M) coding.[9] With this rule change, physicians are able to spend less time checking off boxes in their EHRs.

Applying New Technology

Health IT experts have long called for the development of software that would allow physicians to speak to computers and have their dictation automatically converted to structured data in the EHR. Voice recognition software is incapable of performing this task. Certain kinds of natural language processing (NLP), aided by machine learning, have been used to mine medical concepts from unstructured text.[10] But, partly because of the multiplicity of medical terms for the same concept, NLP software still can't translate speech into discrete data that can be slotted automatically into EHR fields.

EHR companies and third-party developers recently have focused on combining voice recognition and artificial intelligence in "digital assistants" that can help physicians

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document in EHRs using voice commands. "Macros" triggered by voice commands are available in some speech recognition programs, but AI-based digital assistants can do more.

For example, a digital assistant called Suki has been piloted by the American Academy of Family Physicians (AAFP). After analyzing the practice patterns of a particular doctor, Suki understands what that physician intends, not just what he or she says, according to Suki founder Punit Soni. For example, the digital assistant could machine-learn how a particular doctor prefers to document a normal review of systems and generate that part of the note automatically, Soni told *Medscape Medical News*.[11]

In some family medicine practices that tested Suki, this approach cut EHR documentation time by more than 50%, says Steven Waldren, MD, Vice President and Chief Medical Informatics Officer of the AAFP. This time savings increases the amount of time that physicians can spend with patients, he adds.

However, Peter Basch, MD, senior director for IT quality and safety, research, and national health IT at MedStar Health in Washington, DC, is not impressed by Suki. In his view, the digital assistant is a "shortsighted" approach that's tackling "yesterday's problem," especially in light of CMS's new rules on E&M documentation.

"Focusing on a digital assistant rather than on how you're managing the patient is the wrong way to go," he says. The EHR must be able not only to reduce the burden of billing-related documentation, he argues, but also to break away completely from the "checkbox mentality" to help doctors and care teams improve patient care.

The Smart EHR

What Basch envisions is a "smart" EHR that would help him manage his entire patient panel and draw his attention to the most pertinent issues of each patient he sees.

"The EHR of tomorrow would have a screen that says, 'show me how my patient is doing' with particular focus on using visualization techniques," he says. "It would also show me who's in trouble or who's likely to be in trouble, based on whether they're getting sicker or are likely to be admitted or readmitted to the hospital."

Basch says he'd like to have an EHR that places patient information in context. "When I look at a lab result for liver function, I don't just want to see prior results, I want to look at other things if they're elevated," he says. "For example, show me the meds that the patient is on that could possibly impact liver function. Or show me imaging studies. Because right now I do that manually. Let's say people come to see me with abdominal pain, and I'd normally pull up lab results, consults, or imaging studies. Just like Amazon does, the application sees that in other cases, I've asked for the sonogram, not a CT study. It could be a little smarter [than current EHRs] and learn from experience.

Waldren is looking in the same direction. "Two things may help us realize EHRs' potential," he says. "One of them is the alignment of the business forces—the move toward value-based care and payment. Everybody wants to develop the IT tools to deal with that. Also, the technology we have today is still pretty dumb when it comes to understanding clinical terms and clinical content. With the revolution around machine learning and AI, the business will now have the technology to make EHRs much smarter."

The workflow features in EHRs also will have to change to support value-based care, Waldren notes. "But when you try to create workflows, there are a lot of decision points on which path should you follow." There are too many of these decision points in each workflow to pre-program rules for all of them, he points out—"whereas if we can use machine learning to look at the data and predict what people are going to do, it can predict what that next piece of work is likely to be, based on the clinical scenario."

The idea of using machine learning to create a context-based EHR was proposed in a 2012 paper. Such an EHR would standardize, annotate, and contextualize information from the patient record, improving access to relevant parts of the record and informing medical decision-making, the authors said. Instead of simply providing a clinical summary on an EHR screen, it would "synthesize fragments of evidence documented in the entire record to understand the etiology of a disease and its clinical manifestations in individual patients."[12]

Recently, *Google Health* announced it was piloting a context-sensitive clinical documentation tool at Ascension Health, one of the largest healthcare systems in the United States. This tool reportedly provides an improved method of navigation that allows users to jump around in an EHR to search for particular pieces of EHR data and identify related medical concepts. An earlier Google patent application would use its "deep learning models" to guide predictions of future health events and contextualize patient data to highlight pertinent past events in an EHR.[13]

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Going beyond usability, EHRs still fall short in the area of population health management, as noted earlier. They're not designed for use by care teams or care managers, and they can't aggregate or analyze data from outside sources. PHM software vendors—as well as the infrastructure vendors that serve at-risk ACOs and groups—currently help fill this gap. But to coordinate care effectively for individual patients, the primary care groups in our model need a care collaboration platform that would enable greater interoperability among EHRs.

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Interoperability

Ever since President George W. Bush launched a nationwide campaign to computerize healthcare in 2004, interoperability—the ability to share patient information across disparate EHRs—has been one of the government's key objectives. Yet, 18 years later, full interoperability is still far from being achieved.

In 2017, only 10% of physicians could send and receive data, locate data, and integrate data from outside sources into their EHRs, according to a government survey. That was up only one percentage point from 2015. Similarly, the percentage of physicians who were able to simply send and receive data remained flat at less than 40%, and the percentage of doctors who could integrate data actually dropped from 31% to 28%. The only domain in which interoperability improved was in the ability to locate outside data, which jumped from 34% to 53%.[14]

Hospitals and health systems, which have greater resources and IT expertise than do independent medical practices, reported far greater interoperability than did independent physicians. The percentage of hospitals that engaged in all four forms of interoperability jumped from 26% in 2015 to 41% in 2017. Moreover, six in 10 hospitals said their clinicians used outside data in patient care.[15]

However, a recent survey by the Center for Connected Medicine found that only 37% of hospitals were very successful in sharing data with outside providers. Nearly a third of hospitals had trouble sharing data within their own healthcare system. The majority of hospital leaders reported that they were moving to a single system-wide EHR to address these challenges.[16]

Steps Toward Interoperability

The backbone of health information exchange today is still the lowly fax—although in recent years, that has been upgraded to computer faxing. For many medical practices and hospitals that are not on the same EHR, faxing remains the standard method of referring patients, sending consult reports, sending and receiving discharge summaries, and exchanging other clinical documents.

The next step up from faxing is direct secure messaging, a healthcare-specific form of email that a public—private consortium created several years ago. All government-certified EHRs are capable of exchanging direct messages through "health ISPs" similar to the companies that consumers use for conventional email. Providers often attach standardized clinical summaries known as Continuity of Care Documents (CCDs) to these direct messages.

DirectTrust, which created the trust framework needed to authenticate direct messages, reported that nearly 251 million direct messages were exchanged in the second quarter of 2019. That number represented an increase of 53% over the prior quarter and almost 400% over the same period in 2018.[17] David Kibbe, MD, the former president and CEO of DirectTrust, attributes much of the increased traffic to growing uptake by hospitals (personal communication).

However, not many physicians see direct messaging as an advance. Some primary care physicians relate that when they use direct messaging to request a consult with a specialist, they also fax the same request because they're not sure whether the specialist will see the direct message. Moreover, they say, specialists send back reports via direct only sporadically. Some providers use regional and statewide health information exchanges (HIEs) to move certain kinds of data. There are roughly 100 of these entities, which typically enable hospitals to send practices care summaries, test results, and admission-discharge-transfer (ADT) alerts. The number of HIEs hasn't grown in several years, however, and some experts believe that newer network services that include EHR vendors will eventually supplant the exchanges.[18]

Documents vs. Discrete Data

Even if these methods of data exchange were more widely used, they would allow healthcare providers to trade information only at the document level. Document exchange is not true interoperability, because physicians need to be able to find the data they're looking for quickly. When they have to wade through a document and then copy the piece of information they need into an EHR field, the data exchange is too slow and laborious to be effective.

The most promising method for discrete data exchange is Fast Health Interoperability Resources (FHIR), a standards framework that allows information to be exchanged without customized interfaces.

A small amount of progress has been made on this front. For example, the Epic EHR is able to extract problem, medication, and allergy lists from CCDs and deposit them in the correct fields. But Basch notes that he has to accept or reject these lists in total. "When the same person makes three visits to an orthopedist and we get a 20-item problem list and a 10-item med list, and we've already looked at the information once and it shows up again, it's like going through your junk emails, and it's cumbersome," he says.

The most promising method for discrete data exchange is Fast Health Interoperability Resources (FHIR), a standards framework that allows information to be exchanged without customized interfaces. But there are still technical and business challenges to overcome before FHIR can be used to exchange structured information between disparate EHRs. The two main use cases for FHIR today are external apps that expand EHR functionality and the ability for patients to download their own records from patient portals.

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How FHIR Works

In essence, FHIR uses snippets of data known as "resources" to represent clinical entities such as medications and diagnoses. FHIR APIs enable FHIR-based apps to plug into EHRs and use the data in the EHR database for a particular purpose. For example, a consumer can use the Apple Health app's FHIR-based Health Record feature to download his or her records from multiple providers and assemble them into a single personal health record on his or her iPhone.

Other software developers have designed FHIR apps for providers. Examples include pediatric growth charts, calculators for cardiac and atrial fibrillation stroke risk, a chest pain application, a tool for comparing medication prices, and an app that assists in medication reconciliation.

Some EHRs, including those from Epic, Cerner, Meditech, Allscripts, athenahealth, and CPSI, are already FHIR-enabled. Other EHR companies are expected to add FHIR APIs in the near future to meet government certification criteria. The leading vendors have already made available hundreds of FHIR-based apps, according to Nathan McCarthy of ECG Management Consultants. These third-party apps are designed for a particular EHR or can be used with multiple types of EHRs, he says.

Few physicians are using FHIR-based apps yet to expand the functionality of their EHRs, partly because they're so new. Another reason, Waldren suggests, is that the EHR vendors are not allowing FHIR-based apps to "write back" to their software. "There are a lot of technical and security challenges to being able to write back to an EHR's database," he says. "But you've got to have that for these apps to be successful."

Although FHIR apps can pull individual data elements from EHRs, they cannot be used yet for two-way EHR interoperability at the discrete data level. In an interview with cio.com, John Halamka, MD, then Executive Director of the Health Technology Exploration Center of Beth Israel Lahey Health and former CIO of Beth Israel Deaconess Medical Center in Boston, attributed this partly to the write-back issue.

John Kravitz, CIO of Geisinger Health in Danville, Pennsylvania, agrees. "Right now, FHIR integration is mostly outbound," he told cio.com. "There's just one area that's inbound, and those are text-based documents. Discrete data inbound via FHIR is not occurring right now."[18].

Part 2 of this article will appear in PM's April/May issue. **PM**

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