
Achieving the Vision of EHR— Take the Long View

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IN THIS SPECIAL issue of *Frontiers of Health Services Management*, Rosemary Nelson and Michael Sachs discuss various themes pertaining to the adoption of electronic health records (EHR), and creation of the National Healthcare Information Infrastructure (NHII). These are exciting times for healthcare—the adoption of healthcare information technology (HIT) will undoubtedly be a major part of the transformation of U.S. healthcare delivery. While the opportunity is vast, the challenges are many. It is wise for healthcare managers and leaders to take the long view on this journey. In this commentary, I comment briefly on the salient points made by Nelson and Sachs, and then offer my perspectives on key points in the adoption of HIT, and management perspectives critical for our collective success.

Rosemary Nelson, an accomplished leader and change agent in healthcare, describes several key factors for success for the adoption of HIT. First, clear objectives for IT adoption must be stated, and these measures of success—both clinical and financial—must be meaningful to all participants. Planning is critical, not only in defining HIT requirements and selecting appropriate technology, but also to implement and train for use of the new technology. “The EHR is a change management process” states Nelson—both when implementing EHR the first time, and when using the technology as a platform for process redesign and care reengineering. Nelson would suggest change management necessarily implies an incremental approach to technology adoption and process redesign. Finally, Nelson points out that the patient connection is critical not only for HIT adoption but ultimately for the care redesign process as well.

Michael Sachs, an accomplished healthcare strategist and visionary, describes several of the fundamental forces changing the nature of the U.S. economy and their potential impact on the U.S. healthcare delivery system. The World Wide Web (WWW) allowed creation of new approaches to business models—many fiscal and functional intermediaries were removed in the process

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FIGURE 1 EHR Functions

RESULTS MANAGEMENT	ELECTRONIC COMMUNICATION AND CONNECTIVITY
Health Information and Data	Patient Support
Order Entry/Management	Administrative Processes
Decision Support	Reporting & Population Health Management

Source: Tang et al. 2003.

of *disintermediation*, whereby the WWW allows more direct connections to occur between suppliers and potential customers. Mass customization allowed the hyper-segmentation of consumer marketplaces essentially to the individual level—each person could customize their favorite web pages and get personalized recommendations for their online shopping. Sachs describes how modern medical technologies beyond information technology are transforming medical practice, most notably the advances in medical imaging. However, the advances in our understanding of the human genome, and the relationships between our individual DNA maps and disease and treatment, are what will allow mass-customization to occur in healthcare in ways akin to what we have seen with the WWW. Sachs maintains that we are at the advent of a “golden information age” in healthcare as a result of the increased application of information technology and the ability to personalize healthcare treatments based upon the understanding of the human genome.

ACHIEVING THE VISION OF EHR ADOPTION

Three key points need to be kept in mind when considering how to best achieve

the vision of EHR adoption and the transformation of healthcare in the United States. The evidence base is now overwhelming: using EHR in clinical practice saves money for individual practitioners, key stakeholders in healthcare, and society as a whole.

Functionality and Interoperability

Savings only happens, however, when two things are true: (1) when a robust EHR with appropriate features and functions (including clinical decision support) is used in practice, and (2) when EHR systems can interface with other systems, or readily exchange clinical information with other caregivers providing patient care or services.

A Robust EHR

First, therefore, robust EHRs must be implemented and used in practice.

We have a clear understanding of a “robust EHR” from many sources. Paul Tang and the Institute of Medicine committee on patient safety data standards defined standard EHR functions listed in Figure 1. All the functions contribute to the value of the EHR in practice—and all functions contribute in different ways. Physicians benefit, of course, from simply

having information online in a readily accessible format. Knowing a patient's problem list, medication list, and allergy status is critical to providing clinical decision support, particularly in avoiding adverse drug events, serious medication errors, and allergic reactions to medications or their components. By providing decision support during order entry, the EHR may help avoid duplicate tests and procedures, as well as ensure that appropriate precautionary measures are taken and corollary orders are entered in a timely manner. The ability of EHRs to summarize patients' clinical information and communicate that information efficiently to other providers, consultants, and the hospital is important, as is the ability to provide patient education materials to patients at the time of care and sometimes between care visits. The EHR can improve administrative processes, too, such as charge capture during clinical care, documentation and coding of clinical encounters, and accounts receivable through automated interfaces to patient care billing systems. Lastly, the EHR is an essential tool for new models of care—for example, enabling disease management (Hunt et al. 2001) or care for whole populations of patients with common problems, or enabling personal health records as a component of EHR to support doctor-patient communication and improved services delivery (e.g., for appointment scheduling, prescription refills, and access to test results)(Poon et al. 2003; Wald et al. 2004).

Interoperability

Merely having a robust EHR in place and in use is not sufficient; critical to the value proposition (as we will see below) is the ability of the EHRs to *interoperate* with each other, that is, to be capable of

exchanging clinical information in a secure and confidential way with other care providers in the healthcare delivery system, as well as exchanging selected information with other suppliers in the healthcare supply chain. When a patient sees a physician in the clinic or hospital, a host of different transactions are spawned that must be communicated to a wide variety of systems: laboratory orders to the hospital or community laboratory center, billing information to the patient's health plan administrator, prescriptions to the retail pharmacy (after checking with the pharmacy benefits management systems about eligibility and copayment), radiology tests and results with the radiology center, potential public health information to the state public health authority, and so on. When these transactions are done according to the traditional system, the process is slow and fraught with potential error and miscommunication. The EHR is the foundation, the source of essential clinical information from patient care encounters, and a hub around which these transactions can occur.

Value for Stakeholders

The second of our three key points is that, given this platform of EHR functionality and interoperability between EHR systems, the EHR holds the possibility of considerable value for every key stakeholder in the healthcare supply chain. Our studies of the ROI (return on investment) for EHR suggest that each provider has a savings potential of over \$25,000 per year with fairly conservative assumptions about payer-mix, visit volume, and EHR technology and implementation costs (Wang et al. 2003). In an independent study of the value of ambulatory computerized provider order entry (ACPOE) we

find a similar savings potential for the individual physician, as well as a savings potential of \$44 billion dollars per year for society as a whole if EHR were implemented in every clinic across the country with advanced clinical decision support and CPOE (Johnston et al. 2003).

If every EHR was able to exchange healthcare information in a secure and confidential manner with a standards-based systems interface (level 4 interoper-

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ability) society would save an additional \$78 billion dollars per year after implementation, primarily by avoiding the costs of redundant tests and procedures and labor savings from automated information exchange (no

paper-based mailing or faxing) (Walker et al. 2005). However, these savings arise only with advanced clinical decision support in place as part of the EHR, and with EHRs that abide by informatics standards that support information exchange and interoperability.

Obstacles

The third and last key point is that while the evidence base is convincing and the potential value is real, certain obstacles to the adoption of EHR may exist in the United States especially. Our analysis of the value of ACPOE found, for example, that the benefit of ACOPE was disproportionately split between providers and other stakeholders in the healthcare system. In fact, in our benefit-cost model, we found that providers may reap approximately 11 percent of the benefit from using EHR, while payers and other stakeholders have a

savings potential of 89 percent of the total benefit arising from using EHR (Johnston et al. 2003). That is, while the providers are largely footing the bill for adoption of EHR in this country, the payers and other stakeholders are reaping the lion's share of the benefits. This misalignment and other factors have led this observer and others to believe that the marketplace for EHR is *broken* (Middleton et al. 2005). This asymmetric risk and reward, problems with the cost of technology, difficulties with implementation, a turbulent vendor marketplace, and the absence of clear financial incentives have made the physician community, especially clinicians in small office environments, leery of spending on EHR.

A great deal of recent work by several key healthcare leaders and legislators would suggest that the federal government (the largest healthcare purchaser) and several large private healthcare insurers are willing to use the power of the purse to stimulate EHR adoption. For example, incentive programs such as pay-for-performance, or quality bonus programs, as well as grants and other forms of aid, will help U.S. physicians adopt EHR (Middleton et al. 2005).

MANAGEMENT PERSPECTIVES

Given the issues as briefly outlined above, healthcare management professionals must not only understand the relevant technology and market forces affecting the adoption of EHR but also understand their critical role as leaders and managers in this turbulent time of transformation. Three areas of focus come readily to mind as areas where an enlightened management perspective can make the difference between success and failure with EHR, or the difference between those who succeed and those who are left behind.

Leadership

First, sustained, credible, well-financed, and energetic leadership is required for this fundamental and dramatic change. Widespread adoption of healthcare information technology may be similar to the introduction of the first transcontinental railroad, or the telephone, or the PC, or even the web in the scope and magnitude of change it effects in all aspects of healthcare delivery. If the adoption of IT in healthcare is truly the “next big thing,” it must proceed *before* we can usher in the era of personalized medicine, but it won’t be cheap (Kaushal et al. 2005). Without the EHR systems in place and serving as the source data systems for the NHII (National Healthcare Information Infrastructure), we will not fulfill the vision of real-time syndromic event detection and broad-scale biosurveillance. We will not achieve the vision of improved drug post-marketing surveillance. We will not achieve the vision of improved clinical trials data management and broad-based epidemiology research and discovery. We will not achieve the vision of improved understanding of quality of care delivered, and improved consumer choice. We will not obtain significant improvements in patient safety and reduced medical errors. We will not achieve the vision of self-directed care and improved wellness and healthcare maintenance. Leaders in healthcare organizations today must not only see the potential for information technology in healthcare, they must be willing to go the distance, to sustain their vision and leadership, and to materially support the adoption of IT with sufficient resources.

Collaboration

Secondly, the challenge is not only about individual leadership but about leaders

consciously recognizing the importance of collaboration to achieve the benefits of healthcare information exchange across a region. A notable example is the case of the New England Healthcare EDI Network (EDI refers to electronic data interchange) (Glaser, DeBor, and Stuntz 2005). This collaboration, spearheaded by local CIOs and payers who had good working relationships with one another, devised a means to address the administrative transactions flowing between local providers and payers in light of the requirements set forth by HIPAA (the Healthcare Insurance Portability and Accountability Act). The acknowledgment of significant disincentives to collaboration (e.g., “first mover” disadvantage) (Middleton et al. 2005) was of paramount importance, once the local leadership recognized the value of collaboration and decided to act together in a coordinated way. The same kind of collaboration needs to occur across the country in every local medical marketplace to achieve the potential value of healthcare information exchange and interoperability (Walker et al. 2005).

Incentives

The third area for management attention is that the incentives be aligned to stimulate and support the adoption of healthcare IT. The incentives of interest are not only the obvious ones—for example, making sure that the providers paying for healthcare IT are rewarded for using it. Incentives will occur in a variety of ways—pay for performance, quality bonus programs, and the like. When large public and private payers finally determine incentives programs for the use of healthcare information technology, the dam will truly be broken and adop-

tion will proceed apace. Less recognizable incentives are already in place to support the adoption of IT in practice—respect and recognition from clinical peers (as well as a certain amount of peer pressure). Be sure to recognize how the use of healthcare information technology may affect the doctor-patient relationship, in both good and potentially adverse ways. Healthcare IT, in the form of personal health records, should empower patients to be more involved in their care—providers should have an incentive to use this technology to improve the quality and safety of care delivered. Most importantly, providers should have an incentive to use healthcare IT as a core component of their toolset, an essential cognitive aide in the face of an ever-increasing knowledge-base in medicine, and a means by which to transform healthcare into the information age.

CONCLUSION

The adoption of EHR and other healthcare information technology now truly seems to be inevitable—we have a Presidential mandate. To succeed, healthcare leaders and managers must necessarily understand the potential for healthcare IT. The value proposition for healthcare IT is built not only on the impact of EHR and clinical decision support, but also on the facility with which these systems can achieve seamless healthcare information exchange and interoperability. To manage in this fundamental change process, healthcare leaders must not only be committed in a meaningful way, they must lobby for key incentives to stimulate adoption, and they must be willing to collaborate with other institutions to achieve efficiencies and potential savings with healthcare IT. This is a challenge that calls for a long view on this journey.

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