AMERICAN HOSPITAL ASSOCIATION
APRIL 2010

TRENDWATCH

The Road to Meaningful Use: What it Takes to Implement Electronic Health Record Systems in Hospitals

Policymakers and health care providers increasingly recognize health information technology (IT) as a tool for providing efficient, high-quality care. Today, hospitals and physicians use health IT to store health information electronically, facilitate clinical decision-making, streamline clinician workflows and monitor population health. Research suggests that these activities can facilitate more effective care and potentially lower long-term costs for the health care system.[1]

Electronic health record (EHR) systems, in particular, have been the focus of recent attention from policymakers. The *American Recovery and Reinvestment Act of 2009* (ARRA) authorized incentive payments to eligible hospitals and physicians that are meaningful users of EHRs. As a result of the incentives and other funding opportunities, policymakers hope that the majority of hospitals and physicians will have adopted EHRs by 2015. Hospitals are eager to build EHR systems, recognizing them as an essential mechanism to improve patient care and achieve the quality and efficiency envisioned by all health care stakeholders. Implementing these systems, however, is a time- and resource-intensive process. Thus, the timelines established by the ARRA and the regulatory requirements proposed by the Centers for Medicare & Medicaid Services (CMS) may prove challenging for hospitals seeking to obtain incentive payments, or even force rushed adoption and jeopardize successful implementation.

Recent Federal Investment in Health IT: the ARRA

Recognizing the potential benefits associated with greater use of EHR systems, but also the cost of adoption, Congress authorized significant funding to support the widespread adoption of health IT through the ARRA. The majority of these funds will be distributed as incentive payments to eligible providers – including hospitals – that use EHR systems.

The ARRA-stipulated incentive payments, which will be distributed through the Medicare and Medicaid programs, are intended to encourage hospitals and some physicians to become "meaningful users" of health IT. The formula for hospital incentive payments includes a base payment of $2 million and factors in total discharge volume, the level of charity care, the percentage of inpatient days paid for by Medicare or Medicaid, as applicable, and an annual transition factor that scales back the payment over time. CMS estimates that the total payments distributed to Medicare and Medicaid providers will be between $14 and $27 billion over 10 years, though total spending will depend on the number of providers that qualify.[2]

The meaningful use program has three primary goals: standardizing the electronic capture of information such as patient demographics or provider orders; improving quality at the point of care; and using clinical decision support and patient self-management tools as vehicles to improve quality, safety and efficiency. Hospitals are eligible to receive Medicare incentive payments in federal fiscal years 2011 through 2016. Medicare penalties for failing to meet meaningful use requirements will begin in 2015 and be phased in through 2017, at which point they are permanent. Medicaid incentive payments will

American Hospital Association

commence at the discretion of each state, but must begin by 2016 and may not extend past 2021; no hospital can receive Medicaid incentive payments for longer than six years. There are no penalties for non-adoption in the Medicaid incentives program.

CMS suggested a detailed definition of meaningful use in a proposed rule published on January 13, 2010. In their responses to the proposed rule, hospitals indicated support for the goals of the ARRA, but expressed concern that the requirements were too ambitious and the timelines too aggressive. CMS is expected to release a final rule defining meaningful use in late spring 2010.

Another portion of the ARRA funding will be distributed as grants to support the creation of regional extension centers that will offer technical assistance, primarily to community-based physicians, and for health IT workforce training. Grants also will be available for planning and implementation of state-level health information exchange (HIE), which will be administered by existing Regional Health Information Organizations (RHIOs) as well as new community-based collaboratives.[3] These activities will be important in creating the infrastructure for the complex information exchange that is essential to achieving the long-term objectives of health IT.

Finally, the ARRA requires that hospitals use certified EHR systems to receive incentive payments. The Office of the National Coordinator for Health IT has proposed a new certification program, which it expects to finalize in tandem with the CMS rule on meaningful use.

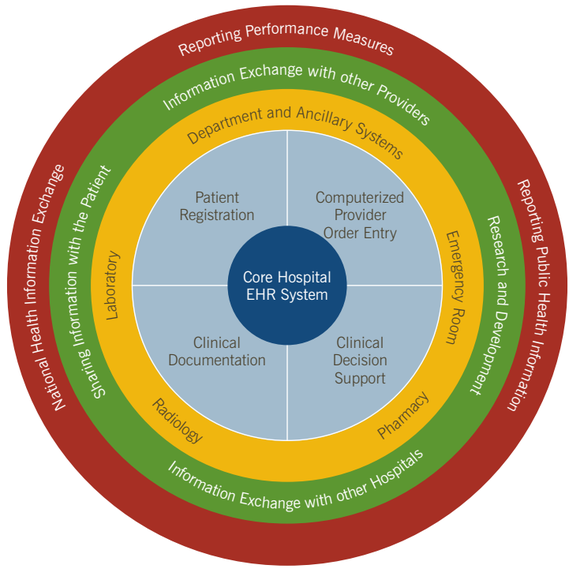
EHR Systems Hold Potential to Improve Patient Care

To date, hospitals have been leaders in adopting EHR systems, often through incremental changes in workflow and health IT use. For example, DeKalb Medical Center in Georgia reported that its EHR system helped reduce medication administration errors – such as wrong person, wrong drug or wrong route of administration – by 66 percent.[4] Medication error reduction – one of many possible incremental successes for users of EHR systems – is attainable because EHR systems often store patient information more clearly and completely than traditional paper-based records and provide alerts of medication allergies or other problems.

EHR systems also can change the practice of medicine for the physician. For instance, they can automatically assemble a patient's health information from various sources. More directly, EHR systems can improve quality at the point of care through the incorporation of clinical decision-making aids, which supplement EHR systems and facilitate best practices by providing physicians with evidence-based guidelines for diagnosis and treatment.[5] Once treatment is complete, physicians can use EHRs with external communication capabilities to share patient data with other members of the care team (Chart 1).

EHRs can facilitate communication within and outside the hospital.

Chart 1: EHR Functions and Communication Capabilities



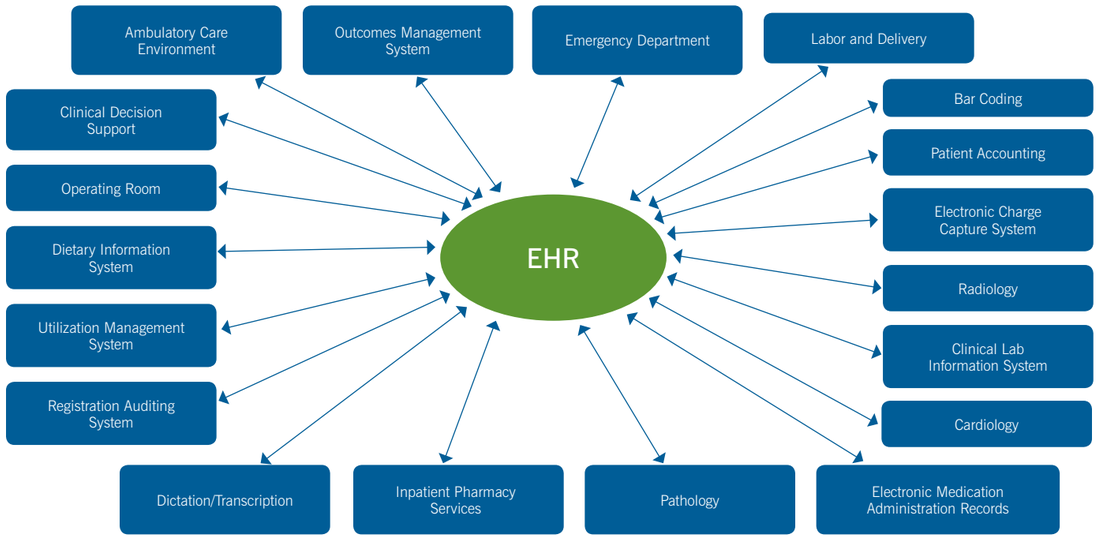
Finally, EHR systems help physicians and hospitals reduce wait times and improve patient throughput by speeding information flow among providers and facilities and by eliminating inefficiencies such as duplicative or unnecessary tests. MedCentral Health System in Ohio, for instance, reduced its average emergency department triage-to-discharge time by nearly two hours, and its triage-to-admission time by more than three hours, after implementing an EHR system in the emergency department.[6]

The quality and efficiency improvements resulting from EHR system use have the potential to generate savings for the entire health care system. One study estimates annual savings of $77 billion for the entire health care system if most hospitals and providers install health IT systems.[7] Some of these savings may accrue to EHR system users, but researchers acknowledge that the majority of the financial and quality benefits supported by health IT are likely to accrue to patients and payers.[8] However, hospitals can increase the return on their investment by eliminating the practice of transcription, replacing film with digital X-rays, and standardizing medications and increasing formulary checks.[9] For instance, Maimonides Medical Center in Brooklyn, NY, saved $10.5 million over five years by eliminating film, film jackets, transcription, and some hardware and software maintenance.[10]

Factors that are not as easily measured in financial terms also impact return on investment. These include increased patient safety and increased patient and provider satisfaction.[11] Importantly, while EHR systems are an essential component of a comprehensive health IT infrastructure, achieving the gains in efficiency envisioned by policymakers will require other advancements, such as information exchange.

Hospital EHR systems integrate many diverse information components.

Chart 2: Sample Connection Points between EHR and Other Systems Within the Hospital



Source: Avalere Health adaptation based on ProHealth Care's hospital information system and electronic medical record.

What Is an EHR System?

The growing interest in EHR systems is due to their potential to improve patient safety, care quality and efficiency by supporting coordinated care and real-time access to information. At its root, an EHR system is an electronic repository of a patient's health information, including patient demographics, progress notes, medications, medical histories and other health information.

More advanced systems also incorporate tools to support decision-making by clinicians, ranging from those as simple as highlighting abnormal lab results to those providing diagnostic decision trees or guiding physicians in their choice of orders to diagnose and treat patient illnesses.

EHR systems have the added potential to communicate outside the hospital, although such functionality is not yet in widespread use. Health information exchange between hospitals across regions and states, and eventually nationwide, is a long-term goal of the ARRA incentive program, though CMS has not yet articulated specific requirements. This capability can improve care coordination for patients who receive care at multiple facilities and enable greater public health reporting, quality surveillance and research.

The EHR system is not a single technology product. Hospitals must integrate dozens of disparate information systems to bring all relevant patient information together at the point of care. This includes departmental systems, such as those installed in the emergency department or operating room, as well ancillary systems, such as those in hospital laboratories, pharmacies and offices (Chart 2). Increasingly, hospitals also are integrating tools to share data through patient portals, report information to multiple public health agencies and connect with other providers in the community.

As communication spreads outside the hospital, privacy and security concerns will become more salient. The ARRA includes some privacy and security provisions – notably changes to the *Health Information Portability and Accountability Act* (HIPAA), such as holding business associates more accountable. It also increases the penalties for privacy and security breaches.

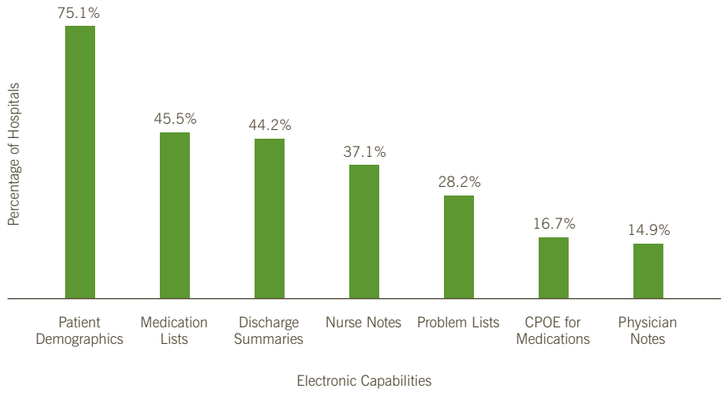
Larger, Urban Hospitals Are More Likely to Have Implemented EHR Systems

Hospital adoption of comprehensive electronic systems has been incremental. For example, a recent survey found that 75 percent of hospitals have computerized systems to capture patient demographics, and 46 percent have computerized medication lists, but only 15 percent allow for the recording of physician notes across all units (Chart 3).[12]

Certain types of hospitals are more likely to have adopted EHR systems. Larger, urban and teaching hospitals are more likely to have both EHR technologies and the health IT staff needed to support them, reflecting in part the greater availability of capital to purchase and support such systems.[13] Incentive funding could help smaller and rural hospitals by defraying the costs of health IT implementation, but these hospitals may face other challenges to implementation, such as obtaining adequate technical support and upfront human and financial capital. Securing these inputs up front is essential for hospitals because most of the ARRA incentives will be paid only after successful implementation has occurred.

Hospitals vary in their specific electronic capabilities.

Chart 3: Percentage of Hospitals that Have Implemented Select Electronic Capabilities in All Hospital Units, 2009



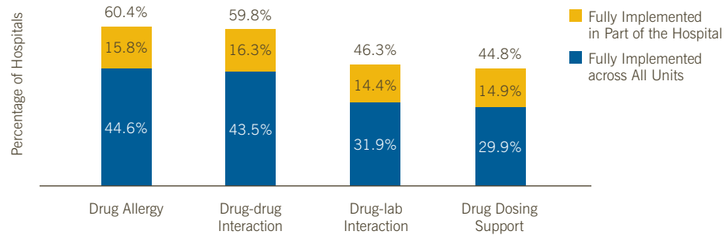
Source: American Hospital Association. (2009). *Annual Survey with Information Technology Supplement.* Washington, D.C.
CPOE = computerized provider order entry

Many small hospitals have made important yet modest changes with the aid of EHR systems. Chester County Hospital in Pennsylvania, for instance, adapted its EHR system to help automate clinical processes for infection control notification, a change that led to a 23 percent reduction in Methicillin-resistant Staphylococcus Aureus (MRSA).[14] Another example is Springhill Medical Center in Alabama, which achieved a 15 percent increase in average patient throughput in the emergency department using an electronic patient tracker and electronic order sets.[15]

Few hospitals have installed the comprehensive EHR systems envisioned in the ARRA. One 2009 study estimated that 1.5 percent of U.S. hospitals have implemented a comprehensive EHR

Many hospitals have already implemented electronic alerts to improve medication safety…

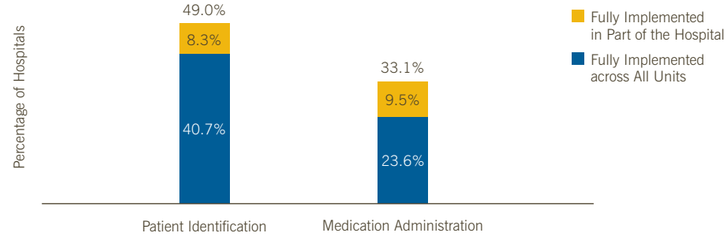
Chart 4: Percentage of Hospitals that Have Implemented Medication Safety Alerts, 2009



Source: American Hospital Association. (2009). *Annual Survey with Information Technology Supplement.* Washington, D.C.

…as well as electronic patient and medication identification systems.

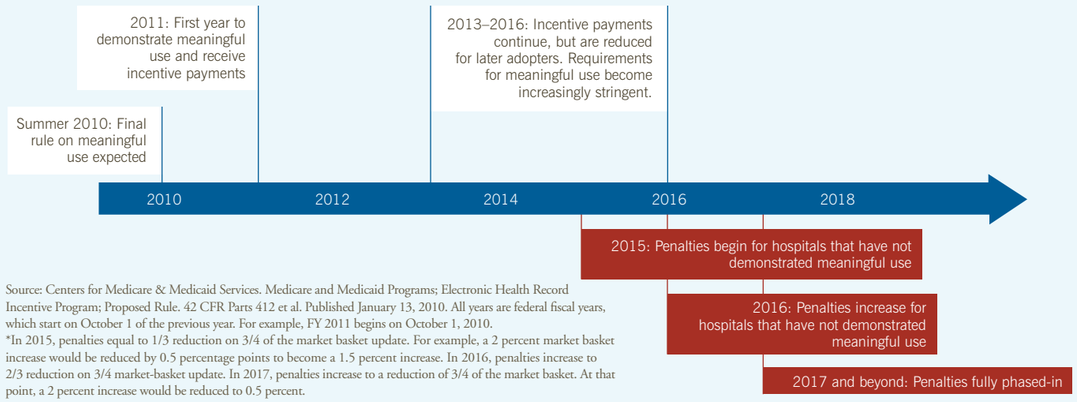
Chart 5: Percentage of Hospitals that Use Bar Codes to Identify Patients and Medications, 2009



Source: American Hospital Association. (2009). *Annual Survey with Information Technology Supplement.* Washington, D.C.

The ARRA: Hospitals are eligible for incentive payments in 2011 and subject to penalties in 2015.

Chart 6: The ARRA Timeline for Medicare EHR Incentive Payments and Penalties



Source: Centers for Medicare & Medicaid Services. Medicare and Medicaid Programs; Electronic Health Record Incentive Program; Proposed Rule. 42 CFR Parts 412 et al. Published January 13, 2010. All years are federal fiscal years, which start on October 1 of the previous year. For example, FY 2011 begins on October 1, 2010.
*In 2015, penalties equal to 1/3 reduction on 3/4 of the market basket update. For example, a 2 percent market basket increase would be reduced by 0.5 percentage points to become a 1.5 percent increase. In 2016, penalties increase to 2/3 reduction on 3/4 market-basket update. In 2017, penalties increase to a reduction of 3/4 of the market basket. At that point, a 2 percent increase would be reduced to 0.5 percent.

system in all clinical care units, and 7.6 percent have implemented a system in at least one unit.[16] The required capital, combined with staffing and other limitations, make large-scale changes difficult. Further, the need to ensure EHR systems maintain patient safety may encourage hospitals to adopt incremental, measured implementation.

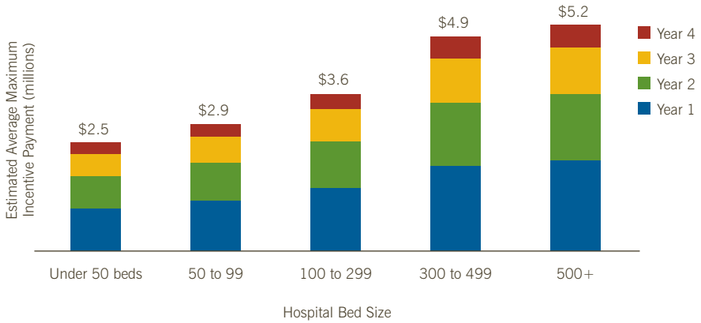
Despite the progress achieved in implementing some electronic capabilities, such as bar coding or medication safety alerts (Chart 4, 5), many hospitals report that they are unlikely to achieve meaningful use, as defined by CMS in its proposed rule, by 2015, at which point penalties for non-adoption will begin. If the final meaningful use requirements are as stringent as those proposed by CMS, the ARRA timeline to achieve meaningful use will be very challenging to meet. The first incentive payments will be distributed in federal fiscal year 2011 and penalties begin in 2015 (Chart 6, 7). Many hospitals, particularly those that have not already begun implementation, may not qualify. Some stakeholders have expressed concern that the timeline could jeopardize hospitals' ability to customize and implement systems that appropriately respond to patient safety concerns. In early 2010, 66 percent of critical access hospitals and 56 percent of rural hospitals did not expect to demonstrate meaningful use by 2015 (Chart 8).[17]

55%

Percent of all responding hospitals that expect to incur penalties

Larger hospitals are eligible to receive higher incentive payments.

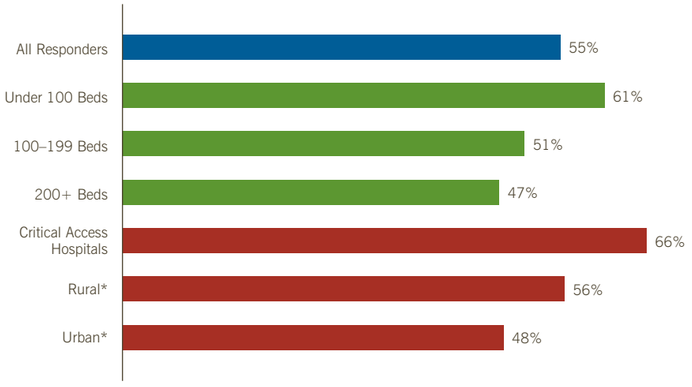
Chart 7: Estimated Average Maximum Medicare Incentive Payment Per Hospital, by Year and Size of Hospital*



Source: American Hospital Association analysis of Medicare Cost Report data for fiscal years 2007 and 2008 and 2008 AHA Annual Survey Data. Assumes all hospitals will meet qualifying criteria in time to receive maximum possible incentive. *Excludes critical access hospitals and those in Maryland and Puerto Rico.

Many hospitals expect to incur a financial penalty for failing to achieve meaningful use by 2015.

Chart 8: Percentage of Hospitals that Expect to Incur a Financial Penalty for Failing to Demonstrate Meaningful Use by 2015



Source: American Hospital Association analysis of survey data from 795 non-federal, short-term acute care hospitals collected in January and February 2010. *Excluding critical access hospitals.
Note: Hospital responses based on meaningful use as defined in the proposed rule released by the Centers for Medicare & Medicaid Services in January 2010. Responses may change based on final meaningful use specifications.

Successful EHR System Implementation Requires Time, Resources and Planning

For hospitals to realize the promise of EHR systems, much planning and deliberation are needed up front. Hospitals need to ensure new health IT is compatible with existing systems and must alter clinical workflows and organizational culture.

Hospitals Must Allow Sufficient Time for Design and Installation

Implementation is a multi-stage process (Chart 9). Sufficient time is necessary to allow for planning and strategizing, selecting or building the system, introducing the system to clinicians, training hospital staff on new tools, customizing the technology to meet the specific and unique needs of the hospital, and performing ongoing maintenance and testing of the system. Together, these steps are essential to ensure a successful outcome.

While planning for implementation, hospitals must take time to identify the expected benefits of the EHR system;[18] analyze costs, benefits and other financial metrics;[19] and obtain the commitment of physicians and staff.[20] Gaining buy-in from staff, particularly physicians, is a critical and time-consuming step; staff pushback against a new EHR system can derail implementation.[21]

After the initial preparation stages, the hospital will need to select a system. The specific platform a hospital chooses will depend on its size, budget and anticipated use of the system, as well as its previous IT investments. For example, a hospital may need to compare a newer, more technologically advanced system to a less sophisticated system that has been on the market longer and already demonstrated its capabilities in real-world settings. Similarly, hospitals can choose between systems intended for a single facility versus entire health care systems. It also is essential that hospitals choose products that are certified – once this process is specified and operational – in order to receive incentive payments. Negotiating an agreeable contract and working with a vendor adds time to this process.

Case Study: Citizens Memorial Healthcare[22]

Citizens Memorial Healthcare's (CMH) implementation of an EHR system illustrates how hospitals can successfully engage and support staff. CMH is a rural health care system in Missouri with one small hospital (76 beds), five long-term care facilities, 25 physician clinics, and home care services. In an effort to streamline care delivery, CMH decided to implement a system-wide EHR in 2000. After spending approximately one year selecting and negotiating with a vendor, CMH signed a contract for this engagement in December 2001. The vendor was able to begin implementation in March 2002, at which point CMH initiated its EHR implementation effort, Project Infocare. By 2005 all facilities in the system were using computerized provider order entry (CPOE), which allows medical practitioners to communicate treatment orders electronically and across settings, and the hospital had ceased maintaining paper charts.

CMH engaged both clinical and administrative staff across departments and levels – up to and including the chief executive officer and board – throughout the planning and implementation lifecycles. Employees were heavily involved in the selection of the EHR system and its functions. Thirty-nine teams of employees were responsible for identifying the requirements needed in a new system, developing and participating in demonstrations, making site visits and recommending vendors and systems. Project leaders noted that CMH's phased approach allowed them to support staff throughout the transition process and that they did not want to employ a process in which "one day it [the EHR system] is off, the next day it's on."

Project leaders used multiple strategies and touch points to ensure continued engagement and buy-in from staff, including marketing the initiative to users across care settings; training staff on basic computer skills to minimize intimidation; phasing in new functions or applications to ensure sufficient support for users; employing ongoing process improvement during implementation; identifying and building on the capabilities of more advanced users while targeting "problem" staff with additional outreach and engagement; and training physicians one-on-one throughout the staged implementation of CPOE.

Since implementing its EHR system CMH has moved on to increasingly sophisticated systems such as a patient portal and home health tele-management. However, leadership at CMH note that the health system will need to take additional steps to achieve meaningful use as defined by the CMS proposed rule published January 13, 2010.

The EHR implementation process is lengthy and complicated and can last multiple years.

Chart 9: Sample EHR Implementation Process

Source: Ganguly, N. (2009). *Healthcare Informatics.* Link: http://www.healthcare-informatics.com/ME2/dirmod.asp?sid=&nm=&type=Blog&mod=View+Topic&mid=67D6564029914AD3B204AD35D8F5F780&tier=7&id=AFFF91F92B25459390339D8BEF270652.

During implementation, the hospital will need to test the system and customize where necessary, create interfaces or connections with existing IT systems, train members of the staff and convert paper charts to electronic form. This final item may require extra staffing or even outsourcing. After the initial implementation, hospitals will have to update continuously the EHR system, re-train the staff and perform system evaluations to determine opportunities for improvement. Much of the time for customization and adaptation may be spent on redesigning and implementing new workflows.

Given the processes needed to achieve a successful outcome, the overall timeframe for implementation can span several years. The chief information officer of CentraState Healthcare System in New Jersey estimates that hospitals need at least three to six months to evaluate and select a system, 18-24 months to install it, and six to12 months or more to troubleshoot and become productive on their systems.[23] The precise timeframe depends on many factors, including the baseline IT capabilities of the hospital, the size and complexity of the hospital and the willingness of physicians to proceed. Implementation of certain functionalities, such as CPOE, can take even longer. Because CPOE is dependent on information flow and care processes, it can require providers to re-orient how they complete and process orders.

Electronic Systems Often Prompt Hospitals and Clinicians to Redesign Care Delivery

EHR system implementation will require hospitals to redesign workflows to ensure installed technology aligns with providers' and patients' needs. These changes encompass office communication, patient flow, provider-patient interaction, and provider-provider communication and coordination, among many others. Workflow changes entail both procedural and substantive re-examinations. For example, before a hospital can roll out a clinical decision support tool, clinicians should review current practice and the medical literature and come to agreement about the "standard care" for each type of case so that appropriate prompts may be programmed into the system.[25] These discussions take time, but offer considerable benefit in engaging clinicians and standardizing care processes.

Electronic workflows require providers to think differently about processes in which they engage every day. Success depends on the ability to understand and map workflows, and then to translate these processes into an electronic tool. Additionally, they may require a rearrangement of current processes. For example, one hospital's medication order process relied on pharmacists to check manually for drug interactions or allergies (Chart 10). After redesign, this function was incorporated into the order-entry process and completed by the physician (Chart 11). Reorganizing this single step in the workflow thus required switches from manual to electronic medication checking and from pharmacist to physician. Similarly, practitioners may rely on consultations with pharmacists, radiologists or other specialists, and could be hesitant about moving to electronic order systems that do not explicitly include such touch points. Hospitals also must consider how health IT systems react to unexpected changes in workflows and ensure an appropriate level of flexibility. For example, a patient requiring emergency care may need medication administered before any interaction with a CPOE system is possible.[26]

Each hospital will need to redesign numerous workflows to achieve a full transition to electronic processes. Redesigning multiple processes at once could prove challenging for institutions and providers. For example, Evanston Northwestern Healthcare (ENH) in Illinois ultimately generated 2,000 unique workflows as part of its EHR system implementation.

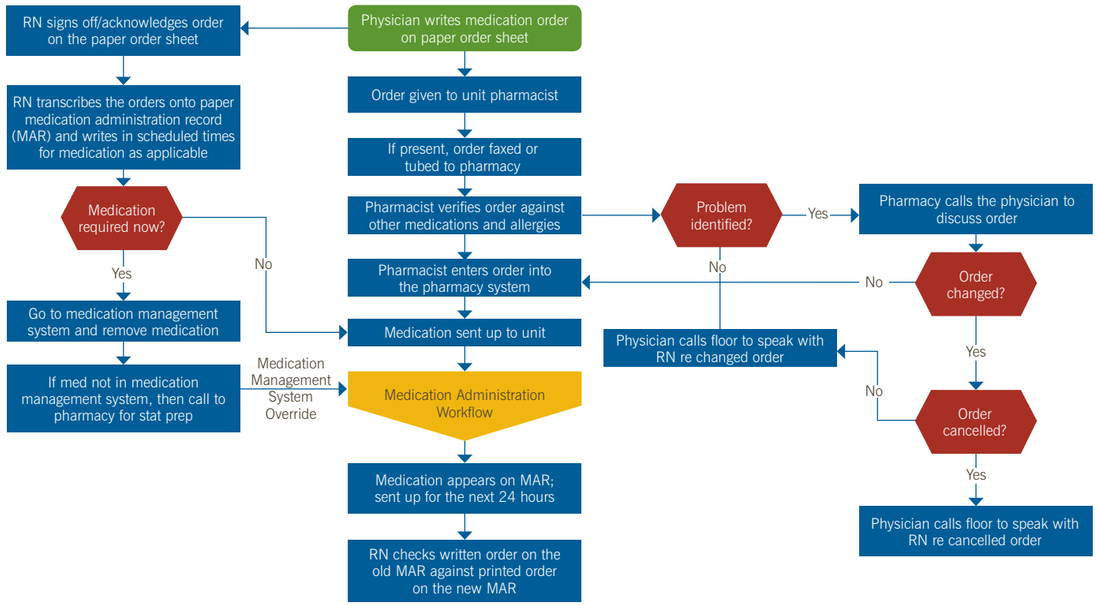
from the field

"[The] extremely aggressive timeline in the American Recovery and Reinvestment Act (ARRA) of 2009 stimulus package places enormous pressure on healthcare practitioners and their organizations to rapidly implement EHRs, often forcing them to install technology without taking the time to tailor systems to organizational realities…. Such rapid implementations could lead to significant patient safety events."[24]

Dean Sittig, Memorial Hermann Health System informatics specialist, and Dr. David Classen, University of Utah in the *Journal of the American Medical Association*

Hospital workflows are complex, multi-stage processes.

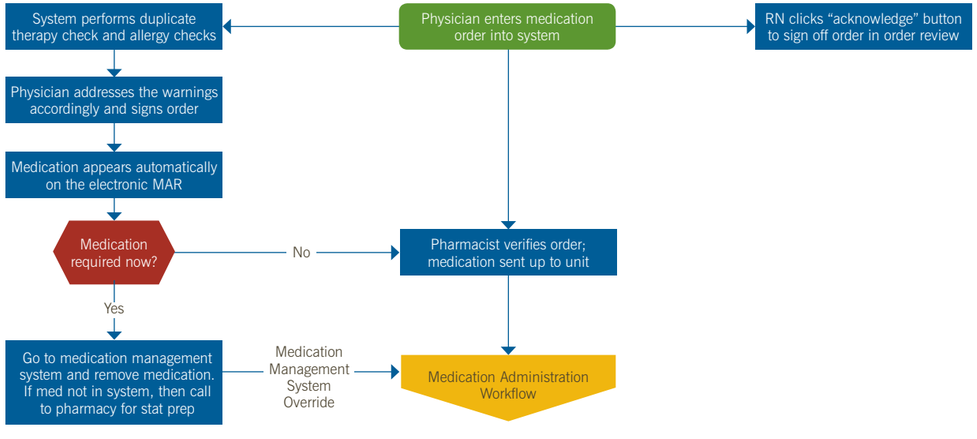
Chart 10: Sample Workflow Process for Medication Order *Before* Redesign



Source: Evanston Northwestern Healthcare. (2004). *Transforming Healthcare with a Patient-Centric Electronic Health Record System.* Application for Nicholas E. Davies Award of Excellence. Link: www.himss.org/content/files/davies2004_evanston.pdf.

EHR systems can simplify workflows.

Chart 11: Sample Workflow Process for Medication Order *After* Redesign



Source: Evanston Northwestern Healthcare. (2004). *Transforming Healthcare with a Patient-Centric Electronic Health Record System.* Application for Nicholas E. Davies Award of Excellence. Link: www.himss.org/content/files/davies2004_evanston.pdf.

Case Study: Evanston Northwestern Healthcare[27]

In 2001, ENH began implementing an EHR system in three hospitals and 68 office locations that employed 1,600 hospital-based and 284 community-based physicians. Project team leaders led more than 150 staff through a systematic evaluation of how patients and information flowed through the health care system. ENH reported that the exercise helped the hospital identify redundancies, workarounds and hand-offs that slowed patient throughput and introduced the potential for errors. Team leaders worked with users to redesign workflows, ultimately yielding 500 integrated, high-level workflows. These eventually translated to 2,000 detailed workflows. Where possible, teams designed electronic workflows and resources to mimic paper versions to maximize familiarity. For example, the nursing documentation toolbar was designed to mirror the paper admission packet. ENH identified workflow redesign and the implementation of new processes as "the most challenging part of the entire project."

Hospitals Must Consider How EHR Systems Will Affect Patient Care

Research suggests that EHR systems enhance the patient experience. A study of the effects of health IT on outpatient primary care visits reported that patients were satisfied with their interactions and that their physicians were more familiar with them and better able to communicate about their medical care.[28] Additionally, patients found that they understood and participated more in the medical decision-making process.

However, some providers fear that increased use of health IT will depersonalize care and create barriers in the traditional relationship between health professional and patient.[29] Time spent navigating the system may reduce the time spent directly on the patient,[30] and having a computer at the point of care may shift the practitioner's attention away from face-to-face engagement. One study found that physicians using EHR systems could not physically orient themselves toward their patients as could physicians using paper records.[31] The same study, however, found that physicians using EHR systems tended to achieve greater patient involvement and participation.

It is critical to note that EHR systems also can introduce new opportunities for error. While EHR system benefits typically far outweigh their harm, hospitals have reported instances of misplaced test results, missing medical information and failure to display allergy information due to EHR system malfunction.[32] Hospitals should take these concerns into account when implementing and starting to use new EHR systems. For example, physicians and other clinicians may need to take extra care in ordering medications to avoid selecting an incorrect parameter, such as route of administration, from a prompt or drop-down list.[33] Similarly, hospitals may need to consider how many and which clinical alerts are most important for patient care. Research shows that an abundance of low-utility or "nuisance" alerts can lead clinicians to ignore all alerts – potentially missing vital clinical information.[34]

Clinical Decision Support Systems

Clinical decision support (CDS) systems equip physicians and other practitioners and patients with knowledge and patient-specific information, intelligently filtered to improve health care quality.[35] For example, CDS tools can help providers select the most appropriate diagnostic imaging test based on the individual patient's symptoms. Effective utilization of CDS has the potential to lower costs, improve efficiency and reduce patient inconvenience, and may help reduce variation in care across practitioners.[36]

As health IT systems become more sophisticated and complex, so too do the implementation and maintenance questions they raise. For example, ensuring that CDS systems are equipped with the best medical knowledge available is very important, but CDS developers have access to multiple and varied sources of clinical information. Nevertheless, it could be challenging for developers and users to keep systems aligned with evolving clinical practice.

Adequate Capital Is Necessary to Ensure Success

Hospitals report cost as a primary barrier to implementing EHR systems and other health IT systems.[37] Seventy percent of hospitals recently surveyed cited upfront cost as a key barrier to achieving implementation, and 60 percent were concerned about ongoing maintenance costs.[38] Incentive payments will help reimburse hospitals' costs of health IT systems, but will not cover all necessary costs.[39]

Experts estimate that EHR systems require major financial investments that can vary widely based on the unique features of the hospital. For example, the hospital's size, integration of any outpatient or non-acute care facilities, number of nursing units and existing technology can all influence how costly an EHR system will be. Estimates range from $3 million for an EHR system for a small hospital[40] to as much as $200 million for a very large hospital,[41] though hospital leaders indicate that costs for large health systems could rise significantly higher.[42] Even hospital leaders who invested in health IT years ago may face high costs to upgrade systems to ensure eligibility for incentive payments. Administrators at White County Medical Center in Searcy, Arkansas estimated that upgrading from their current EHR system to a mid-level computer system would cost $10 million over a five-year period. They determined that even if they received their maximum possible amount in incentive payments, the hospital would still spend more than $3 million in purchasing a new system[43] —and this amount is in addition to the hospital's investment in its original EHR system.

Many hospitals face serious financial strains and challenges in accessing capital as a result of the recession. Nearly half of hospitals reported declining margins and one third reported a negative margin in

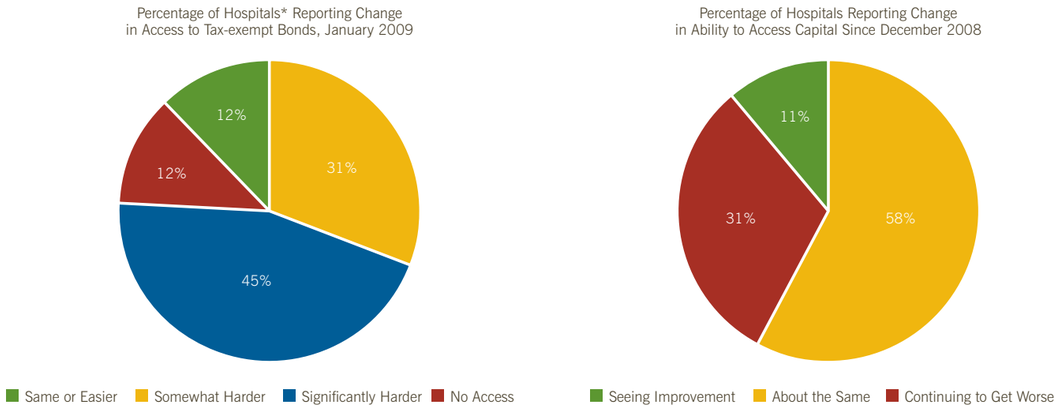
from the field

"The stimulus incentives to comply with the new requirements for purchasing, deploying, and maintaining interoperable EHRs do not come near to compensating the overall costs."[39]

PriceWaterhouseCoopers analysis, *Rock and a Hard Place*

Many hospitals are finding it more difficult to access capital since the 2008 recession.

Chart 12: Percentage of Hospitals Reporting Difficulty Accessing Capital in 2009



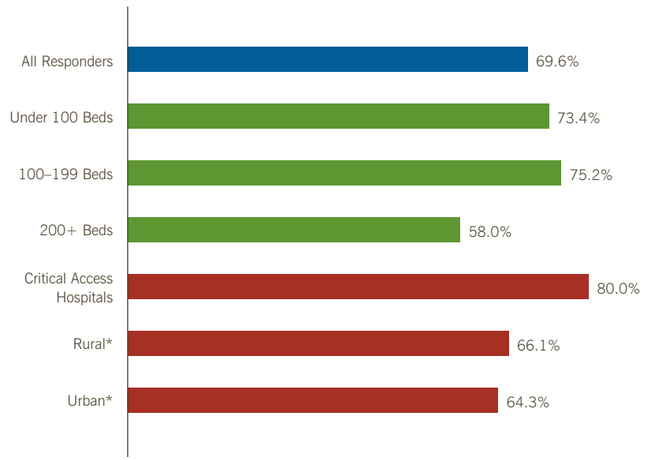
Source: American Hospital Association. (August 2009). Rapid Response Survey, *The Economic Crisis: Ongoing Monitoring of Impact on Hospitals.*
*Excludes those hospitals indicating that they do not use that source of capital.

2008.[44] In addition, 88 percent of hospitals have found it more difficult or impossible to access capital from tax-exempt bonds and 39 percent say they are seeing a downturn in philanthropic contributions (Chart 12).[45] Survey data show that hospital margins are correlated with health IT adoption.[46] Because incentive payments through the ARRA will be available only after hospitals have made significant investments in EHR systems, hospitals need adequate upfront capital to participate (Chart 13).

EHR system deployment is not the only capital investment that hospitals need to prioritize. Hospitals will have to stretch limited resources across facility upgrades, clinical technology and other health IT priorities.[47] Hospitals will have to make difficult choices in deciding how and when to implement an EHR system given competing financial priorities.

Nearly 70 percent of hospitals cited upfront costs as a barrier to achieving meaningful use.

Chart 13: Percentage of Hospitals that Identified Capital Costs as a Barrier to Meeting Meaningful Use Criteria



Source: American Hospital Association analysis of survey data from 795 non-federal, short-term acute care hospitals collected in January and February 2010. *Excluding critical access hospitals.
Note: Hospital responses based on meaningful use as defined in the proposed rule released by the Centers for Medicare & Medicaid Services in January 2010. Responses may change based on final meaningful use specifications.

Hospitals Face External Challenges in Adopting EHR Systems

Even hospitals that effectively manage the internal processes and demands of implementing health IT will face external challenges. The anticipated growth in use of EHR systems is expected to create a significant demand for qualified health IT or informatics experts to install applications and train users.

The number of experts – particularly those who have gone through all technical aspects of implementation – is modest.[48] Recent data from the Bureau of Labor Statistics, the Department of Education and independent studies predict a shortfall of about 51,000 qualified health IT professionals over the next five years.[49] A shortage of trained experts in these areas could limit the rate at which certified EHR systems can be successfully set up and may jeopardize hospitals' ability to meet the ARRA's deadlines for incentives. To help meet workforce demands, the federal government has offered significant assistance for university-based training. The Department of Health and Human Services (HHS) received $32 million in funding from the ARRA to develop a portfolio of grants and cooperative agreements to accelerate the training of health IT professionals.

Hospitals also depend on vendors to provide the software, technical support, training and consulting services necessary for EHR system implementation. Under normal circumstances, hospitals can work according to their own timelines when considering and implementing health IT systems. The meaningful use incentive program deadline, however, places all hospitals under the same time constraints. Many will start their implementation efforts concurrently, likely creating a larger, simultaneous demand for a limited number of health IT vendors and trained professionals. A recent study looked at the implementation experience of nine major vendors with signed contracts to install core clinical systems in large hospitals (200 or more beds) in 2006 or 2007.[50] The vendor with the best implementation record had successfully gone live with CPOE at only 23 percent of its large hospital clients by the end of 2008. At the other end of the spectrum, five of the nine vendors had not yet gone live with CPOE at any of their contracted hospitals. These experiences raise questions as to whether vendors will have capacity to support the demands driven by the ARRA within the timeframe allotted.

The limited number of vendors may lead to long waits for access to health IT support. About 45 percent of hospitals believe limited vendor capacity will be a barrier to achieving meaningful use in a timely manner.[51] Certain hospitals may be disadvantaged as vendors face choices between large, multi-campus health systems and small rural facilities, or past customers versus new contracts. To operate in such an environment, vendors may create new requirements, such as substantial up-front payments, that may not be feasible for many hospitals.

Additionally, hospitals may encounter delays in implementation because of the new EHR system certification requirements. With the emergence of the meaningful use incentive program, HHS has proposed a new approach that would modify the certification criteria to align directly with the provider requirements for meaningful use. To qualify for incentive payments, hospitals must use products certified through the new, yet to be established process. At this point, it is unclear when a sufficient pool of certified products will be available for implementation. Although a previous certification effort by the Certification Commission for Health IT resulted in many certified systems, those certifications may not be sufficient to meet new federal requirements. Hospitals with older systems may find that vendors will not seek certification for these systems—to achieve meaningful use, these hospitals may need to upgrade to new, certified systems.

"from the field"

"The cost to upgrade our current system to the certified version will be well in excess of $10M. As a result, our organization is investigating other vendor options to pursue. Regardless of the vendor decision, ProHealth Care will be investing millions in order to meet the meaningful use certification requirement in an accelerated timeframe. Implementation will take at least 18 months."[52]

Rodney Dykehouse, Vice President and Chief Information Officer, ProHealth Care.

The Road Ahead

Hospitals and policymakers are taking important steps toward realizing the promise of health IT. Hospitals recognize the benefits of health IT tools and support moving toward a technologically advanced health care system. Thoughtful implementation – including a certain level of customization and ongoing refinement – will achieve the best results for patients, practitioners and hospitals. Federal funding, particularly through incentive payments, will be an important boost to hospitals seeking to implement health IT systems.

EHR systems can improve the quality and efficiency of health care in hospitals. Many hospitals already have experienced great successes with their EHR systems, and many others are accelerating their efforts in anticipation of the ARRA incentive payments. The push to implementation must be thoughtfully executed, however, for the health care system to realize the quality and cost benefits of health IT. The financial and human limits of hospitals should be considered, as well as realistic implementation timeframes. Hospitals and policymakers must strike a balance between swift and careful adoption of health IT, and should design programs to reflect these goals.

POLICY QUESTIONS

- How can policymakers balance the desire for rapid acceleration of health IT with the need to set practical milestones for hospitals and physicians?
- How can policymakers and providers work together to identify and understand the critical success factors for health IT implementation?
- How can the costs of implementation be distributed equitably to reflect where benefits accrue?
- What steps do policymakers need to take to enable a robust infrastructure for health information exchange across providers in the future?
- How can policymakers ensure an adequate supply of health IT professionals and sufficient infrastructure to achieve the ARRA's goals?
- How can EHR systems support patient engagement in care and shared decision-making between patient and physician?

ENDNOTES

1 RAND. (2005). *Health Information Technology: Can HIT Lower Costs and Improve Quality?* Santa Monica, CA., and Agency for Healthcare Research and Quality. (2006). Costs and Benefits of Health Information Technology. Rockville, MD.

2 Centers for Medicare & Medicaid Services. (2009). Medicare and Medicaid Programs, Electronic Health Record Incentive Program, Proposed Rule. Access at http://edocket.access.gpo.gov/2010/E9-31217.htm.

3 *American Recovery and Reinvestment Act of 2009.* Public Law 111-5.

4 Healthcare Information and Management Systems Society. (2009). *The Value of Electronic Health Records.* Chicago, IL.

5 Healthcare Information and Management Systems Society. (2010). *Electronic Health Record.* Access at http://www.himss.org/ASP/topics_ehr.asp.

6 Healthcare Information and Management Systems Society. (2009). *The Value of Electronic Health Records.* Chicago, IL.

7 RAND. (2005). *Health Information Technology: Can HIT Lower Costs and Improve Quality?* Santa Monica, CA.

8 Ibid.

9 Health Information Management Systems Society. (2006). *The ROI of EMR-EHR: Productivity Soars, Hospitals Save Time and, Yes, Money.* Access at http://www.featherly-jossi.com/whitepapers/Pat%20White%20Papers/ROI.pdf.

10 Ibid.

11 Goldstein, D., and Groen, P. (2006). Value Measurement and Return on Investment for EHRs. *Virtual Medical Worlds Monthly.* Access at http://www.hoise.com/vmw/06/articles/vmw/LV-VM-08-06-19.html.

12 American Hospital Association. (2008). *2008 Annual Survey with Information Technology Supplement.* Washington, DC.

13 Jha, A., et al. (2009). Use of Electronic Health Records in U.S. Hospitals. *New England Journal of Medicine*, 360(16), 1628-1638.

14 The Health Network of the Chester County Hospital. (2010). *The Chester County Hospital Receives Innovator Award from Healthcare Informatics.* Access at http://www.cchosp.com/cchpage.asp?p=1064, and Healthcare Information and Management Systems Society. (2009). *The Value of Electronic Health Records.* Chicago, IL.

15 Healthcare Information and Management Systems Society. (2009). *The Value of Electronic Health Records.* Chicago, IL, and Eclipsys. (2009). Eclipsys Announces 2009 President's Award Winners. Access at http://investors.eclipsys.com/phoenix.zhtml?c=78585&p=irol-newsArticle&ID=1292261&highlight=.

16 Jha, A., et al. (2009). Use of Electronic Health Records in US Hospitals. *New England Journal of Medicine*, 360(16), 1628-1638.

17 American Hospital Association. (2010). *Electronic Health Records Survey Data.* Washington, D.C. Note: Hospital responses based on meaningful use as defined in the proposed rule released by the Centers for Medicare & Medicaid Services in January 2010. Responses may change based on final meaningful use specifications.

18 Thompson, D.I., et al. (2006). A Review of Methods to Estimate the Benefits of Electronic Medical Records in Hospitals and the Need for a National Benefits Database. *Journal of Healthcare Information Management*, 21(1), 62-68.

19 Ibid.

20 Healthcare Information Management Systems Society. (2007). *Building Enterprise Information Sharing: A Collection of Case Studies.* Access at http://www.himss.org/content/files/BuildingEnterpriseInformationSharing.pdf.

21 Gold, J.A., and Wang, J. (2007). Implementing Electronic Health Records in Physician Offices: Lessons Learned. *Wisconsin Medical Journal*, 106(3),163-164.

22 Citizens Memorial Healthcare. (2005). Davies Award Application. Access at www.himss.org/content/files/davies/2005/CMH_FULL_APPLICATION.pdf and personal communication with Denni McColm, Chief Information Officer, Citizens Memorial Healthcare.

23 Ganguly, N. (2009). *Healthcare Informatics.* Access at http://www.healthcare-informatics.com/ME2/dirmod.asp?sid=&nm=&type=Blog&mod=View+Topic&mid=67D6564029914AD3B204AD35D8F5F780&tier=7&id=AFFF91F92B25459390339D8BEF270652.

24 Sittig, D.F., and Classen, D.C. (2010). Safe Electronic Health Record Use Requires a Comprehensive Monitoring and Evaluation Framework. *JAMA*, 303(5), 450-451.

25 Blumenthal, D. (2009). Stimulating the Adoption of Health Information Technology. *New England Journal of Medicine*; 360, 1477-1479.

26 Hughes, R. (2008). *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville, MD: Agency for Healthcare Research and Quality.

27 Evanston Northwestern Healthcare. (2004). Nicholas E. Davies Award of Excellence, Transforming Healthcare with a Patient-Centric Electronic Health Record System. Access at www.himss.org/content/files/davies2004_evanston.pdf.

28 Hsu, J., et al. (2005). Health Information Technology and Physician-Patient Interactions: Impact of Computers on Communication during Outpatient Primary Care Visits. *Journal of the American Medical Informatics Association*, 12, 474-480.

29 Shortliffe, E. (2005). Strategic Action in Health Information Technology: Why the Obvious Has Taken So Long. *Health Affairs*, 24(5), 1222-1233.

30 Hsu, J., et al. (2005). Health Information Technology and Physician-Patient Interactions: Impact of Computers on Communication during Outpatient Primary Care Visits. *Journal of the American Medical Informatics Association*, 12, 474-480.

31 Makoul, G., et al. (2001). The Use of Electronic Medical Records: Communication Patterns in Outpatient Encounters. *Journal of the American Medical Informatics Association*, 8, 610-615.

32 Shuren, J. (25 February 2010). Testimony before the Health Information Technology (HIT) Policy Committee Adoption/Certification Workgroup. Access at http://www.softwarecpr.com/Allure6scripts/download.asp?File=/hitpolicycommitteemeeting02151Ojeffshurentestimony.pdf.

33 Ash, J.S., et al. (2004). Some Unintended Consequences of Information Technology in Health Care: The Nature of Patient Care Information System-related Errors. *Journal of the American Medical Informatics Association*, 11, 104-112.

34 Kilbridge, P., et al. (2001). Overview of the Leapfrog Group Evaluation Tool for Computerized Physician Order Entry. The Leapfrog Group and First Consulting Group. Access at http://www.leapfroggroup.org/media/file/Leapfrog-CPOE_Evaluation2.pdf.

35 Brener, E.S. (2009). *Clinical Decision Support Systems: State of the Art*. Rockville, MD: Agency for Healthcare Research and Quality., and Osheroff, J.A., et al. (2006). *A Roadmap for National Action on Clinical Decision Support*. Bethesda, MD: The American Medical Informatics Association for the Office of the National Coordinator for Health Information Technology.

36 Brener, E.S. (2009). *Clinical Decision Support Systems: State of the Art*. Rockville, MD: Agency for Healthcare Research and Quality.

37 Jha, A., et al. (2009). Use of Electronic Health Records in US Hospitals. *New England Journal of Medicine*, 360(16), 1628-1638.

38 American Hospital Association. (2010). *Rapid Response Survey Data: Electronic Health Records.* Washington, DC. Note: Hospital responses based on meaningful use as defined in the proposed rule released by the Centers for Medicare & Medicaid Services in January 2010. Responses may change based on final meaningful use specifications.

39 PriceWaterhouseCoopers. (2009). *Rock and a Hard Place: Analysis of the $36 Billion Impact from Health IT Stimulus Funding.* Access at http://www.pwc.com/us/en/healthcare/publications/rock-and-a-hard-place.jhtml.

40 Hypatia Research. (2009). *ARRA and EHR: What Healthcare CIOs Need to Know About the American Recovery and Reinvestment Act and Electronic Health Records.* Access at http://nextentconsulting.com/hypatiaresearch_arra-ehr_summary90109.pdf.

41 Lasalandra, M. (29 October 2009). Impact of Electronic Medical Records Discussed. *Harvard Public Health Now.* Access at http://www.hsph.harvard.edu/now/10302009/impact-of-electronic-medical-records.html.

42 Personal communication with leadership at two health systems, 31 March 2010.

43 Personal communication between American Hospital Association and Ray Montgomery, President and Chief Executive Officer of White County Medical Center, 25 March 2010.

44 American Hospital Association. (2009). Hospitals and Communities Continue to Feel Recession's Impact. *AHA News Now.* Washington, DC.

45 American Hospital Association. (2009). Rapid Response Survey, *The Economic Crisis: Ongoing Monitoring of Impact on Hospitals.* Washington, DC.

46 American Hospital Association. (2007). *Continued Progress: Hospital Use of Health Information Technology.* Washington, DC.

47 American Hospital Association. (2009). Hospitals and Communities Continue to Feel Recession's Impact. *AHA News Now.* Washington, DC.

48 Hagland, M. (2009). Got People? *Healthcare Informatics*, 26(12), 36-42.

49 U.S. Department of Health and Human Services, Office of the National Coordinator. (2009). *American Recovery and Reinvestment Act of 2009: Information Technology Professionals in Health Care: Program of Assistance for University-Based Training.* Washington, DC.

50 KLAS Enterprises. (May 2009). *Meaningful Use Leading to Improved Outcomes.* Access at www.KLASresearch.com.

51 American Hospital Association. (2010). *2010 Annual Survey with HIT Supplement.* Washington, DC.

52 Personal communication between American Hospital Association and Rodney Dykehouse, Vice President and Chief Information Officer, ProHealth Care, 25 March 2010.

TrendWatch, produced by the American Hospital Association, highlights important trends in the hospital and health care field. Avalere Health supplies research and analytic support.

TrendWatch – April 2010
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