CHAPTER 1

The Case for Electronic Health Records

Brian R. Jacobs, MD

“Information is really the lifeblood of medicine ... Health information technology is its circulatory system.”

—David Blumenthal, MD, MPP, National Coordinator for Health IT

INTRODUCTION

It has been more than a decade since the Institute of Medicine reported that up to 98,000 deaths per year are a result of medical errors, but little progress has been made in addressing this critical situation in healthcare. Even more alarming, we now know that this number significantly underestimates the true impact of medical errors in the United States.

Though much progress has been made in reducing hospital-acquired infection rates and length of stay for common conditions, positive sustainable culture change in quality and safety has been painfully slow.

In 2007, the Agency for Healthcare Research and Quality (AHRQ) published their National Healthcare Quality Report, which noted an average improvement of less than 2 percent per year from 2000–2005 in patient safety indicators, despite the release of several important evidence-based safety publications. The Congressional Budget Office estimated that 5 percent of the nation’s gross domestic product (GDP)—or $700 billion per year—is spent on unnecessary medical tests and procedures that do not actually improve health outcomes. These figures exceed the estimated resources required to cover the entire healthcare costs for the uninsured population of the United States.

Now more than ever, we need to ensure that the highest quality care is delivered to every patient in every healthcare environment, every time. Congruent with this notion, the National Quality Forum in 2010 established these six national priorities:

1. Enhance patient safety primarily through the prevention of medical errors.
2. Improve care coordination across the community and within healthcare organizations, encompassing medication reconciliation, avoiding unnecessary emergency department visits and preventing hospital re-admissions.
3. Improve patient and family engagement, including informed decision-making, patient self-management and an improved patient care experience.
4. Improve palliative care, focusing on the relief of physical symptoms, help with psychosocial and spiritual needs, effective communication regarding treatment options and access to high-quality palliative and hospice care.

5. Avoid overuse of inappropriate healthcare, which includes medications, laboratory and diagnostic testing, warranted maternity care, procedures and consultative services.

6. Improve population health such that all Americans receive effective preventive services and adopt healthy lifestyle behaviors, and having national health indices established. Congressional health reform proposals are re-emphasizing the necessity of moving forward with integrated healthcare. This rationale capitalizes on studies from academic centers and experience from integrated healthcare organizations suggesting that when patients receive healthcare in organized settings, costs are greatly reduced and adherence to evidence-based guidelines is far greater.4

Physicians and other healthcare providers are often ill-informed regarding the quality of the care they provide. Recent data suggest that only one in four physicians receives personal performance data and fewer than one in five physicians receives information on outcomes for their patient population.5 It is unreasonable to expect the healthcare system to improve when providers are not aware of their actual performance, expectations of their performance and opportunities to improve.

Health IT is often referenced as a centerpiece of the health reform movement, and will likely play a significant role in addressing many quality issues. As more healthcare organizations purchase, implement and meaningfully use health IT, opportunities for improvement will be discovered, analyzed and refined. And this information will be widely disseminated, resulting in significant improvements in the quality of care delivery.

Discontinuity of Healthcare Delivery

Healthcare in the United States is most often delivered in silos. Individuals who develop an illness or injury typically begin their transit through the healthcare system in an urgent care center before being transferred to an emergency department. Then, they are admitted as an inpatient to a medical/surgical care unit or intensive care unit. Upon discharge, patients follow-up with their primary care physician.

Clinicians at each care venue in this transit need to make evaluation and treatment decisions, but are often hampered by insufficient information from the previous healthcare environment. It can be challenging—and is inappropriate—for a patient to accurately recall diagnoses, laboratory and radiology testing results, and prescribed medications. Written records, if they are transferred with the patient, can be incomplete or hard to decipher. And the process of obtaining medical records from a previous provider can be so challenging and delayed as to not be effective as a resource in optimizing diagnostic and treatment decision-making.

The impact of discontinuity on healthcare delivery is extensive.6 Laboratory tests, radiology studies and procedures are often repeated, incurring additional care delays, unnecessary costs and patient dis-satisfaction.7-9 Diagnostic decisions are made with incomplete and/or inaccurate information. Treatments may be started or continued that are not in the patient’s best interest.
Inefficiency
In most areas of the country, access to care remains a significant problem. Patients must often wait weeks for primary care or specialty appointments. Emergency department throughput inefficiencies can result in excessive triage-to-doctor and doctor-to-inpatient-bed wait times.

In the ambulatory setting, patients are generally dependent on getting through to an office during regular working hours to initiate the process of appointment negotiation, rather than having direct electronic access to appointment slots. Appointment schedules are burdened by last-minute patient or provider cancellations, late patient arrivals and manual appointment reminder systems, if they exist at all. Furthermore, in preserving their autonomy, providers are not always amenable to efforts aimed at improving their efficiency.

Finally, the dynamics of patient and provider workflow within the office or hospital setting are complex and often filled with waste. Some of the simpler processes, such as refilling medications or obtaining a laboratory requisition, typically require that a patient endure a process that involves placing a telephone call, leaving a message and waiting for the call to be returned—or even traveling to the clinician’s office for service. Hand-written prescriptions brought to pharmacies are delayed by manual insurance verification prior to medication preparation labeling and dispensing, which also involve delays.

Ineffective Care Delivery
It has been estimated that only 54 percent of the care delivered to patients is evidence-based care. Treatment inconsistencies between providers for the same conditions are more the rule than the exception. Providers in a paper-based care delivery environment make decisions on medication selection, dosing and duration without benefit of the latest decision support; and when decision support is utilized, it often resides outside their workflow and may not employ the most appropriate or recent references. High patient volumes can result in clinicians simply not having the time to seek support to make informed diagnostic and treatment decisions.

Redundant Care Delivery
What is a provider to do? The patient sitting before him/her arrives with illegible, incomplete or no information. A complete blood count or chest radiograph may have just been performed for another provider, but the results are not available for the current assessment, necessitating repeat testing to render appropriate care. In addition, the lack of readily available information during specialty referral often results in repeat testing.

Poor Customer Satisfaction
The patient caught in the middle of the inefficiencies and frustrations of the healthcare system is less than enamored with this situation. Family, work and personal time, which are already at a premium, suffer as a result, leading to widespread patient dissatisfaction. As a result, patients may choose to avoid preventive care visits or seek acute care in high-efficiency, limited services care venues such as urgent care clinics.
THE ELECTRONIC HEALTH RECORD TO THE RESCUE

Accessibility and Legibility

The traditional written patient medical record resides in the chart racks of the ambulatory practice, the health information management department of the hospital or, in the case of an active patient, in the stack of paper or the loose-leaf notebook at the patient’s bedside. Parts of the patient record may also be located in other venues of care if the patient has, for example, multiple specialists or is provided care in a non-hospital setting, such as rehabilitation or a behavioral health facilities. Accessibility to this record for orders or documentation requires the physical presence of the clinician at the location of the medical record, with one exception, which is the verbal order called in from a remote location by the prescriber to the recipient. Further compounding this inaccessibility, written prescriptions, orders and documents are often illegible, ambiguous, incomplete and devoid of identifying information such as date, time, clinician name and degree. Additionally, paper-based records do not have the benefit of evidence-based practice and/or alerts. Such documents are often associated with adverse events, errors and protocol/policy violations. ¹

Addressing this gap, one of the immediate benefits associated with implementation of the electronic health record (EHR) includes improved accessibility and legibility of the medical record. Patient orders, medications, documents, allergy information, laboratory and radiology results in the EHR are accessible beyond the bedside anywhere within the organization, and, ultimately, even among unaffiliated organizations.

With remote access through virtual private networks, information can be obtained anywhere in the world in a secure and private manner with an appropriate device and Internet connectivity. In addition to accessibility, this information is guaranteed to be complete, legible and unambiguous—with clinician name, degree and entry date/time. Therefore, nursing documentation, testing results and orders can be reviewed and care delivered remotely without the need to return to the clinic, emergency department or inpatient bedside.

Safety Advantages

Multiple studies have demonstrated improvements in medication safety as a result of the effective EHR adoption. Prescription errors are diminished in both the ambulatory and inpatient environments, and this benefit is augmented by combining computerized prescribing with effective clinical decision support (CDS).¹²

Properly designed, implemented and monitored CDS has been associated with significant safety advantages, including avoidance of overdose; prescribing a medication to which the patient is allergic; and recommendations for corollary orders (e.g., an aminoglycoside level check to be ordered with a long course of aminoglycoside therapy).

Turnaround time for STAT services such as critical medications, radiology testing and respiratory therapy have been demonstrated to improve, particularly when the EHR is implemented with process improvement and notification enhancements.¹³

This can be particularly important when appropriate timing of diagnostic bedside tests and treatments are essential to favorable patient outcome (e.g., first dose antibiotic for serious bacterial infection).

The miscommunication, which is considered the root cause of many patient care delivery errors, can improve through the increased legibility of provider documentation
that comes with EHR implementation. This improvement has been associated with several advantages, including reduced clarification calls from the pharmacy for illegible prescriptions, clear communication between care providers on therapeutic plans and goals and coherent patient discharge instructions. Disease-, condition- and procedural-based care are often inconsistent between patients and providers. Inconsistency and non-protocolized care likely result in inconsistent outcomes. The EHR allows the adoption or creation of templates, care plans and sets of care orders that are evidence- or consensus-based. These tools allow the prescriber to provide consistent care to every patient, every time.

The Data-Driven Organization and Quality Applications

The traditional approach to quality often begins with a labor-intensive sampling of written patient records, serious event occurrences and consensus meetings. But this approach often leads to education and other interventions, which may not have a sustainable impact on quality. The EHR provides a rich source of granular and comprehensive clinical data, which can be collected, analyzed and disseminated.

Through this process, opportunities for quality improvement are often detected and targeted with focused interventions. The results of these interventions can then be followed sequentially, utilizing the same EHR data. The performance improvement processes of the organization can be made more efficient, comprehensive and effective. Targeted reporting to individual or groups of providers gives them the information needed to support effective quality efforts.

Engaging the Patient, Family and Primary Care Physician

Patients, family members and primary care providers often express concerns regarding their involvement in integrated care delivery. Information gleaned from laboratory and radiology studies, diagnostic and therapeutic procedures, emergency department, clinic and hospital visits are often difficult to obtain in today’s complex healthcare environment. The EHR offers these stakeholders the opportunity to not only view and download this information but to contribute to its content and accuracy. Healthcare organizations that choose to adopt patient portal modules for their EHR open the opportunity for these activities, as well as such critical tasks as appointment scheduling, communication with providers, medication refills, retrieval of education materials and important links.

Health Information Exchange

According to the eHealth Initiative, there are now more than 50 active health information exchanges in the United States. These exchanges allow for the secure and private movement of important information, including demographics, medication, laboratory, radiology, problem lists, allergy, immunization, provider documents and other data across large networks, thus facilitating the availability of information to providers with a need to know and a desire to improve care delivery.

The EHR, as a primary source of important health data, represents an important component to the effectiveness and value associated with health information exchange. Though interoperability challenges exist, these will likely be overcome in the near future. Health information exchanges allow for the analysis of regional health data in recognizing
trends, patterns, disparities and opportunities for improved healthcare delivery, as well as an infrastructure to introduce region-wide interventions.

**CONCLUSION**

In subsequent chapters, we will explore the accomplishments of many organizations in realizing the enormous value of implementation, adoption, and meaningful use of the EHR for patients, providers, and organizations. These organizations in many cases represent captains of sailing vessel in open waters. They are charting our route, exploring new environments, and communicating both their successes and challenges as we move toward a new era.

**References**