



## Editorial

# The tragedy of the electronic health record

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The good physician knows his patients through and through, and his knowledge is bought dearly. Time, sympathy, and understanding must be lavishly dispensed, but the reward is to be found in that personal bond which forms the greatest satisfaction of the practice of medicine. One of the essential qualities of the clinician is interest in humanity, for the secret of the care of the patient is in caring for the patient.

—Francis W. Peabody<sup>1</sup>

The Winter 2015 issue of *The Pharos* featured an article titled, “The Electronic Health Record: Are We the Tools of Our Tools?” by K. Patrick Ober and William B. Applegate (pp. 8–14). In it, the authors described their institution’s and physicians’ experiences with electronic health record (EHR) systems, discussed the general state of EHRs and how they are used today, related the problems they have experienced with EHRs, and made recommendations for changing how we use them to reestablish the primacy of the doctor-patient relationship.

Their article hit a nerve. We and the authors received many comments on the article, two of which can be seen in Letters to the Editor on page 43. They were, as one might predict, almost uniformly in agreement that EHRs fall far short of what physician and patients need.

My own first experience with EHRs was in the 1990s in a university ambulatory care internal medicine practice. I

looked forward to the coming implementation with anticipation, since I felt that EHRs would improve patient care, leading to more efficiency and safety. I was disappointed, as many of us were. Twenty years later, we are still disappointed.

It is important to emphasize that medical records have existed since the beginning of the profession of medicine. Some of the first medical case histories frequently used in teaching were written by Hippocrates in the fifth century BC. The clinical medical record appeared in the nineteenth century in Europe in major teaching hospitals, and was soon adopted in the United States. The modern medical record was developed in the twentieth century—data about each patient, including clinical data, was recorded, organized, often in a standardized format, and stored.<sup>2</sup> Improvements in medical records continued during and after World War II in step with advances and progress in medicine. Complete and accurate medical records enabled physician and institutions to better care for and treat patients and improve the safety and quality of care.

In the 1960s, Dr. Lawrence Weed developed the problem-oriented system, the SOAP system for organizing medical records in follow up visits in the hospital and office.<sup>3,4</sup>

At roughly the same time, work began in developing an electronic medical record system to manage the increasing volumes of paper records. Adoption began in the 1990s and continues to today.

Regardless of the format and storage of the clinical record,

there are essential elements of the medical record that are fundamental to clinical reasoning and the care of the patient, including: chief complaint, medical history and other patient information, physical examination, assessment and clinical reasoning, diagnosis or differential diagnoses, diagnostic plan, treatment and therapy, and proposed follow up.

What doctors have long been told remains true: “Listen to your patients, they are telling you the diagnosis.” Listening to the patient, followed by reflection, takes time but is a key part of the doctor-patient relationship and the care of the patient. The importance of listening in eliciting the medical history is highlighted in Kathryn Montgomery’s book *How Doctors Think: Clinical Judgment and the Practice of Medicine*.

Despite all the prohibitions against “anecdotal knowledge” in medicine, case narration is the principal means of thinking and remembering—of knowing—in medicine. The interpretive reasoning required to understand symptoms and signs and to reach a diagnosis is represented in all its situated and circumstantial uncertainty in narrative.<sup>5</sup>

During the acquisition of the history, active clinical reasoning is constantly occurring: generation of hypotheses, clinical reasoning, questions, information acquisition, further hypotheses, and more clinical reasoning as a conscious active process. The physician takes the patient’s story, logically organizes it, and records it in the medical record. The chronological narrative and sequence is then used to infer causality. This becomes the basis for medical cognition—the physician uses medical and scientific knowledge and applies it to the history and examination to reach a diagnosis and develop a plan. In addition, the process of taking the history and retelling the story contributes to the doctor-patient relationship and the care of the patient. This also leads to better patient understanding of their illness.

Progress notes as well are often organized chronologically, with the narrative provided by the patient about the interval symptoms and suffering—combined with observations about what has happened in the interval from nurses and others, pertinent examination findings, test results and their interpretations, and information from consultations—resulting in an assessment based on clinical reasoning about the progress of the patient’s condition.

A medical record—whether paper or digital—must preserve the information that the physician carefully and thoughtfully elicits from the patient in a form that, above all, facilitates clinical reasoning. Current EHRs do not.

Current EHRs have, in many cases, resulted in serious negative or harmful unintended consequences, foremost of which are disrupting the doctor-patient relationship and interfering with quality patient care. It is not just that the technology is new and still needs to be widely implemented and used. We are well beyond that phase, and adverse effects on patient care

are well documented.

While the bad outweighs the good, the few positives of the use of EHRs include:

- The availability of a legible medical record during a visit.
- Improved tracking of guideline compliance and markers of disease control over time.
- Better communication with patients and between providers by facilitating access to other providers’ notes and through patient messaging applications.
- Increased billing and revenue generation and generation of relative value units (RVUs).
- Access to patient information when on call.
- Administrative documentation.

On the other hand, a 2013 RAND Corporation report performed at the request of the AMA, *Factors Affecting Physician Professional Satisfaction and Their Implications for Patient Care, Health Systems, and Health Policy*, reported this:

We found that EHR usability represents a relatively new, unique, and vexing challenge to physician professional satisfaction. Few other service industries are exposed to universal and substantial incentives to adopt such a specific, highly regulated form of technology, which has, as our findings suggest, not yet matured.<sup>6</sup>

The RAND study also reported that, unfortunately, physicians’ experiences with EHR functionality did not improve over time. Even more distressing, the more functions the system gained, the more complex it became, and the harder it was for physicians to use it, worsening their ability to care for patients. Typical attributes of EHRs that make patient care harder for physicians are:

- Data entry is time consuming, inefficient, and difficult to navigate.
- Multiple user interfaces do not match the clinical workflow, resulting in non-intuitive order entry.
- Finding and entering information in the EHR interferes with the doctor-patient relationship, interposing a computer between doctor and patient.
- Health information exchange and interoperability are inefficient and insufficient.
- Constant automatic alerts are both distracting and result in information overload.
- The EHR’s meaningful use criteria and the most important elements of patient care do not match.
- The high cost of acquiring the EHR and the cost of ongoing maintenance and support are financial risks with no reimbursement.
- EHRs require physicians to perform clerical tasks that decrease their clinical care and efficiency.
- Template-based notes degrade the quality of clinical documentation and care.

RAND’s conclusion: “Better EHR usability should be an

industry priority and a precondition for EHR certification.”<sup>6</sup>

The Institute of Medicine (IOM) in its 2011 report, *Health IT and Patient Safety: Building Safer Systems for Better Care*,<sup>7</sup> concluded that poorly designed EHRs had introduced new safety risks, including dosing errors, failures to detect life-threatening illnesses, delayed treatments, and data losses, some of which had led to serious injuries or deaths. The IOM recommended adopting “quality management principles that included systems that are user-friendly, mandatory reporting of adverse events, and creating an agency to report system safety problems and make recommendations for change.”<sup>7</sup> However, there is still no requirement to report safety or other problems.

EHR vendors have resisted listing or reporting requirements, citing contractual clauses that prevent sharing. This has prevented widespread awareness about safety problems or dangerous conditions specific to certain EHRs.

It is not just that the current technologies are new and take time to implement and learn to use. That is an impediment, but we are beyond that phase. Our continuing negative experiences and adverse effects on our care of patients are now well documented.

The Joint Commission in a 2008 report, *Safely Implementing Health Information and Converging Technologies*,<sup>8</sup> specified strategies to prevent patient harm related to EHRs:

- Have an interdisciplinary team examine workflow processes for risks and inefficiencies and resolve these issues prior to implementation.
- Continuously monitor for problems during introduction of new technology and address any issues as quickly as possible.
- Develop a graduated system of safety alerts in the new technology that helps clinicians determine urgency and relevancy, and decide which alerts need to be hard stops.
- Require departmental or pharmacy review and sign off on computerized physician drug-order entries that are outside the usual parameters.
- Continually monitor and report errors and near misses or close calls caused by technology through manual or automated surveillance techniques.
- Conduct a root-cause analysis following system errors; consider reporting significant issues to well-recognized external reporting systems.<sup>8</sup>

Implementation and use of EHRs adversely affect most of the practice of medicine, including medical education, clinical reasoning, physical examination, and the doctor-patient interactions of rapport, empathy, respect, compassion. Physicians are distressed, dismayed, and dissatisfied—an indication of how much the use of EHRs has undermined the doctor-patient relationship. EHRs have failed to make patient care better, more efficient, or more satisfying for the patient or the doctor, and they have not improved safety.

This should not be surprising, since the EHRs were

designed by programmers, not physicians or patients. EHRs require physicians to perform computer tasks not directly relevant to the care of patients, instead of making it easier to do what they need to do. The technology should be “invisible,” helping instead of hindering the physician.

EHRs appear to have been designed with the initial and ongoing erroneous assumption that all patients are “average,” and that their complaints, symptoms, illnesses, and suffering can fit into fixed templates, boxes, and algorithms. But individual patients are unique, and the best care for a patient cannot fit a multifaceted patient into a one-size-fits-all box. We must address this problem—and soon.

It is dismaying to recognize that current EHRs cannot be easily used in a situation like a clinical visit, something for which they were putatively designed. Two current approaches to solving this problem are both flawed in that they require additional funding of uncompensated time.

In one, the physician spends her entire time with the patient in a traditional clinical interaction, after which she dictates or types the information into the EHR on uncompensated time.

In another, each physician is assigned a medical scribe, a trained but unlicensed helper who enters information into the EHR or chart at the direction of the physician. The scribe’s responsibility is to observe the physician-patient interaction and reliably record the history, physical exam, conversation, diagnoses, assessment, plan, and orders. The physician later reviews and edits the record. Scribes also respond to messages to physicians, locate information for the physician to review, and research information and questions for the physician. Scribe salaries are generally not billable.

Other possibilities include the use of voice recognition and recording software or smart pens, which physicians may use during the clinical visit. Such transcripts need careful review and editing, again uncompensated.

All these are mere band-aids, designed as workarounds to the primary problem, which is that EHRs are badly designed for the job they are meant to do.

If we were designing an EHR from scratch, how would we start? First: involve physicians and the other members of the health care team, the people who use EHRs. Begin with a comprehensive, chronological task analysis, mapping and timing every step of a wide variety of clinical encounters. Then work with engineers, programmers, and—especially—end users to establish human interface guidelines for the EHR that will assure that using it is logical, efficient, and user friendly.

The IOM report pointed out that:

Creating safer systems begins with user centered design principles and includes adequate testing and quality assurance assessments conducted in actual or simulated clinical environments, or both. Designers and users of health IT should work together to develop, implement, optimize,

and maintain health IT products. For most end users, an effective health IT product will provide easy retrieval of accurate, timely, and reliable data; incorporate simple and intuitive data displays; and yield evidence at the point of care to inform decisions. Among other improvements, the product will

- enhance workflow, perhaps by automating mundane tasks or streamlining work, without increasing physical or cognitive workloads;
- allow easy transfer of information to and from other organizations and providers; and
- cause no unanticipated downtime.<sup>9</sup>

Today's EHRs impede workflow, are a roadblock to easy information transfer, and can cause significant downtime because of the need for specialized technical assistance. The EHR has unintentionally become more important than the patient.

Current EHRs are based on proprietary software whose source code is a closely guarded secret, owned by companies who place major restrictions on their use or modification, and are extremely expensive to license. What if those most interested in improving health and the care of the patient could collaboratively develop a robust, easily usable, accessible, searchable, and affordable EHR for the physician and patient? One solution to our current problem could be the development of open source EHR software that would be widely available and could continuously be developed and improved. Such a solution requires the partnership of physicians and other health care workers with engineers and programmers, and a passionate commitment to improving the sad state of EHR.

The recent report from the American Medical Informatics Association, *Report of the AMIA EHR 2020 Task Force on the Status and Future Direction of EHRs*, makes the following recommendations for EHRs:

- Simplify and speed documentation—decrease data entry burden for the clinician; separate data entry from data reporting; enable learning and research at the point of care.
- Refocus regulation—improve data exchange and interoperability; reduce re-entering data; prioritizing patient outcomes over new functional measures.
- Vendors should use public standards-based application programming interfaces and data standards that enable EHRs to become openly available to innovators, physicians, researchers and patient to improve the systems.
- Promote the integrations of EHRs into the full social context of care.
- Improve the designs of interfaces so that they support and build upon how people think and work.

It is possible, of course, that development of an EHR that improves the clinical interaction cannot be done. The interaction of physician and patient, the primary reason for a clinical visit, is distinct in both its objective and its importance from

the interaction of physician and computer. Perhaps the best we can expect is an EHR that does not degrade the experience by imposing itself between the doctor and the patient with its repeated requests for attention.

The medical profession is at a critical crossroad, and EHR is an urgent issue requiring rapid and effective action. The EHR is here to stay, but must and can be developed to serve the doctor and the patient.

Physician leadership and involvement are critical. The doctor-patient relationship and care of the patient, not the computer, are primary. But the effective use of computers and EHRs has the potential to serve medicine and the care of the patient with major improvements.

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