## Health IT and Diagnostic Safety: Promise and Peril

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When it comes to information technology (IT), clinicians and hospitals might advise, "Be careful what you wish for." Embraced as the answer to many of healthcare's safety problems, technology provides useful tools that may improve but in no way guarantee safety. In fact, health IT can introduce as well as prevent or catch errors and must be designed, implemented, and monitored carefully, like any other tool used in patient care.[1]

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Electronic health records (EHR), in particular, are caught between high expectations for delivering safer, more efficient care and frustration based on poor performance. Clinicians complain that electronic records slow them down and make their work more difficult.[2] Patients who access their records often do so out of self-defense, concerned that they may be harmed by incorrect information in the EHR.[3]

Healthcare providers and consumers will eventually reap the full benefit of electronic records, but many view current EHR systems as a disappointment. In *The Digital Doctor,* Robert Wachter observes that some consumer electronics, such as Apple's iPhone, breeze through the Gartner Hype Cycle,[4] sliding easily from the "peak of inflated expectations" to the "slope of enlightenment" and "plateau of productivity," wasting little time in the "trough of disillusionment," where healthcare technology seems to be stuck.[5(p247)]

Efforts to use health IT to improve diagnosis are not immune to this double-edged effect of benefit and risk. In 2010, Gordon Schiff and David Bates examined the promise and peril of electronic documentation in the context of diagnostic safety.[6] Describing 15 ways that electronic documentation can improve diagnosis, they also identify hazards and challenges. They look forward to the day when the diagnostic process becomes less "heroic"[6(p1066)] and more reliable because physicians are supported with good information supplied in ways that are supportive and compatible with clinical workflows.

### Divided Attention

Data and information are crucial to diagnosis, but how they are presented and what the IT system demands of the user may determine whether they help or hinder the process. In addition to increasing risk by causing errors or supplying incorrect information, technology can also degrade the cognitive process by distracting physicians—essentially competing with the patient for a physician's attention—and adding irritation and delay.

Reporting on a healthcare design conference held in Boston in 2015, Andy Oram observes that healthcare technology poses a challenge that designers don't usually face when writing software or apps for other industries. In patient care settings, technology often does not (must not) have the user's full attention. The clinician "must alternate constantly between interacting with the software and interacting with a living human being….The app must not only be unobtrusive, but must support the clinician's interaction with the patient."[7(np)]

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Making a dinner reservation, depositing a check, or buying a plane ticket online are simple tasks compared with documenting a clinical visit, but most of us give technology our full attention during these mundane transactions. Physicians should give patients their undivided attention, but find that computers are getting in the way.[8] Oram calls this the "big unsolved problem in design for health IT."[7(np)] It has also created the opportunity for medical scribes, who assist physicians by recording patient data in the EHR, to become a fast growing segment of the healthcare workforce.[9]

Physician, author, and educator Abraham Verghese thinks that having computers come between patients and physicians is a serious problem, leading potentially to the chart becoming a surrogate for the patient.[10] "In a digital environment, where residents on inpatient rounds may have a more intimate experience with the record than the patient, there is danger that patients will become 'iPatients' and physicians lack the experience, learning and joy that can come only from physically caring for real people at the bedside."[10(p2749)] Access to a wealth of digital information may improve diagnostic safety, but if physicians lack hands-on experience, diagnosis may suffer.

### Information Exchange

In a digital world, there are good reasons why a patient's data and information need to be exportable beyond the walls of one institution. People are highly mobile, and their health records should be, too, though this is another area where healthcare's complexity and business model create problems. Efforts continue in the United States to promote and enable health information exchange (HIE), often through regional, state, or institutional networks,[11] so that physicians can access a patient's complete medical records from remote sites. Quick access to complete records is especially crucial in emergency medicine where time is of the essence, and patients may arrive without the ability to describe their medical issues and history.

A workgroup of the American College of Emergency Physicians (ACEP) recently studied the role of HIE in emergency medicine and issued recommendations to maximize its effect and value.[11] The advantages of HIE for diagnosis in emergency medicine are similar to other settings—more information is better—with similar challenges: lack of access due to competition between organizations, data quality, workflow, lack of standards, and poorly designed interfaces.[11]

The workgroup also raises a concern related to having more health information about a patient than physicians can review and absorb in the time allowed. Given the volume of data currently generated, demands on a physician's time and attention, and difficult computer user interfaces, the workgroup questions if physicians should be held responsible for absorbing all of the information supplied by the HIE.[11] Recommending that a standard of care and best practices be established for emergency physicians' approach to information, they observe, "It is unrealistic that the standard of care require a full review of all records on every patient."[11(p80)]

Information overload—especially information that is unmoderated and poorly displayed—is a problem in all settings. Schiff and Bates observe, "The problem of having too much information is now surpassing that of having too little…"[6(p1067)]

### Innovative Solutions

Getting full benefit from electronic records may require new ways of entering and searching for data to create useful information. In addition to functioning as data interfaces, EHRs are being used increasingly as communication systems—messaging members of the team, ordering tests, tracking results, scheduling follow up—and that functionality must be included in newly designed or redesigned systems.

One innovative suggestion comes from John Halamka, chief information officer of Beth Israel Deaconess Medical Center, chairman of the New England Healthcare Exchange Network, and co-chair of the federal HIT Standards Committee, who imagines how clinical documentation and communication might function in the future.[12] Health information for each patient would include data generated by medical devices and the patient, plus medical records from various providers, in a system that would promote care coordination across the community. Halamka also sees "social documentation"[13(np)] becoming the vehicle for clinical notes and communication within a team, including the patient and using tools such as Wikis and social media to create a collaborative, real-time, dynamic electronic record.[13]

Meanwhile, physicians and hospitals must do their best with current systems and help improve and create systems for the future. Ongoing evaluation of system performance will always be important. A 2015 study found misleading and unreliable graphical displays of diagnostic laboratory test results.[14] The authors measured the accuracy of data displayed in EHR systems from eight leading vendors across 11 criteria (eg, patient ID is visible, precise data point values are available) and found all to be lacking, some dramatically so.[14] Accuracy must not be taken for granted.

## Technology as Scapegoat

Widespread agreement that current EHRs are imperfect may lead to misunderstandings about the causes of safety problems, including misdiagnosis. The mismanagement of the first patient to be diagnosed with Ebola in the United States provides an example. Thomas Eric Duncan had just arrived from Liberia, where Ebola was endemic, when he went to the emergency department (ED) of a hospital in Dallas in 2014. He presented with fever, nausea, and other symptoms consistent with Ebola and told the triage nurse he had recently been in Africa. The ED physician who evaluated Duncan was not aware of his travel history, which the nurse had recorded in the EHR. The physician diagnosed Duncan with sinusitis and sent him home. Duncan returned to the ED two days later, was admitted, tested for Ebola, diagnosed, and died from the disease 10 days after admission. The hospital originally blamed the misdiagnosis on the EHR, claiming it had failed to deliver the information about Duncan's travels to the physician—but later admitted that was not true.[15]

Experts who have studied the failures in Duncan's care found that over-reliance on the EHR and lack of inter-professional teamwork contributed to the missed diagnosis.[15,16] One group of physician researchers admits, "physicians tend to ignore nursing notes, whether on paper or in the EHR."[16(p285)] Inferior design or implementation cannot always be blamed for failures. Indeed, poorly designed systems can easily become scapegoats and obscure the true cause of adverse events.

Health IT systems, including EHRs, can be used effectively to improve diagnosis, but must be designed, implemented, and evaluated with care. Overly optimistic beliefs about the ability of health information technology to fix safety problems or even to be accurate, as well as blanket assumptions that electronic health records are always to blame, are counterproductive.

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# Medical Societies and Healthcare Organizations Join SIDM in Coalition to Improve Diagnosis

**Founding Organizations**

ABIM Foundation

American Association of Nurse Practitioners

American Board of Internal Medicine

American Board of Medical Specialties

American College of Emergency Physicians

American College of Physicians

American Society for Healthcare Risk Management

Consumers Advancing Patient Safety

The Leapfrog Group

National Patient Safety Foundation

Society to Improve Diagnosis in Medicine

**Government Partners**

Agency for Healthcare Research and Quality

Centers for Disease Control and Prevention

The Society to Improve Diagnosis in Medicine (SIDM) is proud to announce the creation of the Coalition to Improve Diagnosis. The Coalition is a collaboration of leading healthcare organizations representing clinicians and other healthcare professionals, as well as patients and families, employers, insurers, researchers, policymakers and educators. More than a dozen major medical societies and healthcare organizations have joined forces to address diagnostic errors in medicine through the newly formed coalition.

"The Coalition will bring much-needed attention, awareness and action to this issue," said Paul Epner, MBA, MEd, chair of the Coalition to Improve Diagnosis and executive vice president of SIDM. "Engaging leading healthcare organizations, professional societies and patients is an essential step in improving the quality of care patients receive and in reducing harm that can result from diagnoses that are inaccurate, missed or inappropriately delayed."

"Physicians excel at diagnosis, but errors or delays in reaching the right diagnosis still create harm, and we can do better," said Mark L. Graber, MD, FACP, president and founder of SIDM. "The vision of our Society—SIDM—is to ensure that diagnosis is accurate, timely, and efficient. The Coalition to Improve Diagnosis will be the catalyst for changes in practice needed to realize this vision."

Member organizations have committed to take measurable action to improve diagnosis through the collective actions of the Coalition, as well as opportunities available to and led by each member organization.

Visit *www.DxCoalition.org* to learn more.

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## Patient Summit: Participation and Prevention

**Free public session**
1:00 pm – 5:30 pm
Saturday, September 26, 2015
For further details, visit:
    *https://improvediagnosis.site-ym.com/?ProgramDetails2015*

The program is free, but registration is required. Learn how patients and families can help improve the system and influence healthcare policy affecting diagnosis. SIDM invites participants to inform its work to provide resources and advocate for patient engagement in the diagnostic process.

Held in conjunction with the
### 8th Diagnostic Error in Medicine International Conference
September 27–29, 2015
Hilton Alexandria Mark Center
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The Society to Improve Diagnosis in Medicine would like to recognize the corporate members and organizations that support our society and its mission of attaining better outcomes through better diagnosis.

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