

REVIEW ARTICLE

Adoption of electronic health records and barriers

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Electronic health records (EHR) are not a new idea in the U.S. medical system, but surprisingly there has been very slow adoption of fully integrated EHR systems in practice in both primary care settings and within hospitals. For those who have invested in EHR, physicians report high levels of satisfaction and confidence in the reliability of their system. There is also consensus that EHR can improve patient care, promote safe practice, and enhance communication between patients and multiple providers, reducing the risk of error. As EHR implementation continues in hospitals, administrative and physician leadership must actively investigate all of the potential risks for medical error, system failure, and legal responsibility before moving forward. Ensuring that physicians are aware of their responsibilities in relation to their charting practices and the depth of information available within an EHR system is crucial for minimizing the risk of malpractice and lawsuit. Hospitals must commit to regular system upgrading and corresponding training for all users to reduce the risk of error and adverse events.

Keywords: *medical errors; electronic health records; implementation; lawsuit; malpractice; hospitalists; hospitals; meaningful use; patient safety; Quality of care*

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Electronic health records (EHRs) are not a new idea in the U.S. medical system, but surprisingly there has been very slow adoption of fully integrated EHR systems in practice both in primary care settings and within hospitals. For those who have invested in EHRs, physicians report high levels of satisfaction and confidence in the reliability of their system. There is also consensus that EHRs can improve patient care, promote safe practice, and enhance communication between patients and multiple providers, reducing the risk of error.

Some studies suggest high levels of user satisfaction and enhanced patient care with the adoption of an EHR system. In 2008, *The New England Journal of Medicine* reported that 82% of EHR users report improved clinical decision-making, 92% report improvement in communication with other providers and their patients, and 82% of users report a reduction in medication errors (1). Despite these potential advantages, uptake on full EHR integration has only recently seen a significant increase with the passage of the Health Information Technology for Economic and Clinical Health Act in 2009.

This legislation has offered incentivized payments through Medicare and Medicaid for those office-based

practices and hospitals that adopt an EHR system as a means of improving quality of care (2). This multistage project incentivizes health care providers to implement or enhance the electronic capture of patient information and includes a provision that patients are to be provided with copies of their health information. It further aims to increase the 'meaningful use' of health information to engage in ongoing quality improvement initiatives directly at the point of care and in the exchange of information between providers (3). However, offices and hospitals that enroll in the program must meet certain milestones within specified timeframes to avoid fines and other penalties (4).

Barriers to implementation

Lawsuit and legal complications

Integrated EHR systems have the potential to significantly improve patient safety and quality of care within the hospital; however, there are many significant barriers to implementation that must be addressed by leadership before committing to hospital-wide adoption. Before transitioning to an EHR system, organizations must identify and dedicate

appropriate administrative and medical personnel to work on implementation, which includes a dedicated liaison between the organization and EHR vendor (5). Identifying a team lead and site ‘champion’, along with practicing appropriate change management techniques, is more likely to lead to a positive transition phase (6). Communication with the EHR vendor about specific needs and workflow design should be prioritized to ensure that the system is ready for full implementation when it is scheduled to ‘go-live’. Success depends on a seamless conversion from one charting system to another, and there is no guarantee of data integrity during the transition phase; however, a well-planned and executed implementation can minimize some of these risks (7).

If implementation is done poorly it can increase the risk of error, in turn exposing physicians and hospitals to potential medical malpractice lawsuits and other legal complications. Some studies have shown that medical error, adverse patient events, and even mortality can increase when a new EHR system is introduced (1). This can be explained through an increase in user error while entering information into an unfamiliar IT system and EHR system-wide crashes that create problems in care processes or limit access to important patient information (1). A more recent study published in the *British Medical Journal* found that in the immediate 30-day period before and after a single day EHR roll-out at 17 U.S. hospitals, there were no adverse short-term effects on patient safety, suggesting that accounts of negative experiences at a single hospital can be problematic when evaluating success of implementation (8).

Legal precedent suggests that providers are responsible for reducing risk during the transition phase, with one federal court ruling that the hospital had a duty to ensure that physicians had timely access to lab results while an electronic system was installed and operationalized (1). The hospital had the responsibility to maintain effective workaround solutions to minimize disruption to patient care and clinical decision-making, in effect requiring duplication of work during the transition phase. If the implementation is short lived, this requirement is a nuisance that disappears relatively quickly. Should EHR system installation take longer than anticipated or the project meet with unexpected delays, processes are slowed, decision-making is impacted, and patient care potentially jeopardized. Furthermore, the Health Insurance Portability and Accountability Act (HIPAA) clearly states that hospitals are solely responsible for their EHR system, including how it is used (9). This requirement places significant burden on hospitals to ensure appropriate policy and technical support are readily available, all at significant cost to the organization.

EHR systems also increase the amount of data and documentation available for review in the event of a medical error or adverse event. In one case where a patient

was left as a quadriplegic after surgery, the competency of the surgeon was originally called into question, but when EHR metadata was further analyzed it was discovered that a time stamp raised question as to whether the anesthesiologist was present for the entire surgery (7). This level of detail available to prosecutors may heighten the risk of malpractice allegations among an entire team of providers (7).

Increased risk of medical error

As providers become more comfortable with an EHR system, learned dependence on built-in clinical decision-making tools may risk critical human decision-making, leading to medical error (7). Simple actions made possible through computerized record keeping, like copy and paste, may cause a typing error to be copied over and over again, leaving a long trail of mistakes that could potentially lead to medical error (7). A 2005 study showed that a widely-used computerized physician order entry system facilitated 22 different types of medication error risks, including inventory displays being mistaken for dosage guidelines, fixed ordering formats that generated wrong orders, and display screens that prevented a coherent view of the patient’s medications (7).

The legalities and risk associated with EHR adoption may be further amplified by the tendency of physicians to practice independently and to not ask for help when they may not fully understand a practice or protocol (7). Responsibility for content entered into the system is that of the physician, and without appropriate training and ongoing review of electronic charting practices, the risk of medical error increases (10). Hospital leadership must address the need for training and commit to regular, ongoing skill upgrading for all EHR system users in order to maintain competency and catch user mistakes before they lead to an adverse event. Furthermore, physician responsibility to review an entire database of notes collected by a community of care providers for each patient, and to base their decision-making on the previous observations and actions of others is a threat to physician autonomy and individual practice preferences (11).

Cost of implementation – who pays?

Legal and ethical implications aside, the cost of EHR systems is one of the largest contributory factors of failed widespread adoption (11). One of the primary issues that is still unresolved is who pays for the implementation of an EHR system, as it is currently health care payers that see the most benefit (11). Approximately 89% of the monetary benefits gained from EHR systems benefit health care payers rather than those who finance implementation (11). Additional costs are incurred through regular system upgrades, and ongoing maintenance creates an environment where physicians and hospitals are disincentivized to add an EHR system to operations.

Costs for a five-person practice to implement an EHR system are approximately \$162,000 in the first year and \$85,000 a year in maintenance costs, and these expenses can easily reach far into the millions for an individual hospital (4). Federal investment in EHR implementation across the country as part of the Health Information Technology for Economic and Clinical Health Act has already reached \$25 billion (4), and without addressing the barriers to successful implementation, this venture threatens to be an ongoing waste of public tax dollars with limited benefit to patients and physicians alike.

As EHR implementation continues in hospitals, administrative and physician leadership must actively investigate all of the potential risks for medical error, system failure, and legal responsibility before moving forward. Ensuring that physicians are aware of their responsibilities in relation to their charting practices and the depth of information available within an EHR system is crucial for minimizing the risk of malpractice and lawsuit. Hospitals must commit to regular system upgrading and corresponding training for all users to reduce the risk of error and adverse events.

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