

# Electronic Health Records: Patient Safety and Liability Concerns

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Health information technology has significantly shaped the landscape of modern healthcare, and electronic health records (EHRs) represent one of the most consequential technological advances in recent decades. EHRs have revolutionized the documentation of patient care. For the majority of healthcare organizations and practitioners, paper records are a relic of the past.

Virtually all hospitals in the United States use EHRs, and almost 90 percent of office-based physicians have adopted these systems.<sup>1</sup> The shift from paper to electronic records has been slower in dentistry, but the number of dental practices implementing EHRs continues to grow.

Over the years, the promise of EHR capabilities has been ambitious and perhaps borderline utopian — these systems have been lauded as a way to vastly improve patient safety, efficiency, care coordination, and information sharing. However, the reality of

EHRs has been a complex intertwining of incremental improvements, new risks, and ongoing frustrations. Many benefits have been tempered by negative effects or outcomes. For example:

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- Increased access to patient data has resulted in information overload and data dumps.
- Enhanced clinical decision support and patient alerts can cause alarm fatigue when not properly designed or implemented.
- The convenience of electronic prescribing and referrals has been moderated by system glitches and human factors that result in errors or oversights.
- The elimination of handwriting illegibility has been offset by printed versions of EHRs that contain coding gibberish or massive amounts of meaningless data.

- Efficiencies in billing and coding processes have been negated when poor documentation processes lead to the replication of inaccurate information.

These examples illustrate the figurative seesaw that the healthcare community has experienced with EHR technology. As a result, feelings about EHRs often are mixed, and many providers cite EHR issues as a key contributor to clinician burnout.<sup>2</sup> Dissatisfaction with EHRs also has been noted as a reason for clinician turnover.<sup>3</sup>

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In addition to clinical and operational issues, EHRs also have introduced a new dynamic in malpractice liability. Contributing factors in EHR-related litigation include problems with documentation practices, user errors, system issues/design, conversion issues, and training and education. Additionally, cases involving EHR factors were costly and more than half resulted in high-severity outcomes (i.e., permanent disability or death).<sup>4</sup>

This article focuses on areas in which EHR-related risks may occur due to time constraints, inexperience, oversight, system usability, or other factors. Risk strategies are presented for each area covered, with the hope that they will lay the groundwork for more thorough discussions within healthcare organizations about how to manage risks associated with complex EHR systems.

## Implementation/Conversion

Moving from paper records to an EHR system, or converting from one EHR system to another, is inherently risky because data can be lost or misplaced, workflow processes change, and users require new skills and knowledge.

Implementation/conversion is a multistep process that should involve:

- Organizational needs assessment
- Due diligence review of vendors and products
- Strategic planning
- Ongoing evaluation and adjustment once the system is in place.

The Office of the National Coordinator for Health Information Technology (ONC) notes that successful implementation requires a two-phase approach: pre-implementation and implementation.<sup>5</sup> The first phase focuses heavily on the “big-picture” strategy, including establishing an overall implementation plan, developing governance processes, and designing workflow patterns.

The pre-implementation phase also includes communicating with providers and staff about the new system and the conversion process as well as providing ample training opportunities. Careful evaluation of workflow processes and an open dialogue with staff may help identify potential issues early so the organization can develop and apply effective solutions.

The second phase involves more detailed evaluation and adjustment, such as tailoring the system to meet the specific needs of the organization, establishing a change-management process, and determining how to transfer information and reconcile legacy data with data in the new system, so as not to misplace important records or overlook critical health information.

The implementation phase also involves providing overall support for the new system and encouraging providers and staff members to adopt the new technology. Workforce cooperation and compliance are critical during the implementation phase. The individuals managing the process should realize that some providers and staff may welcome the new technology, while others might resist the change.

### Case Example

A patient’s orthodontist referred her to an oral surgeon for elective extraction of several teeth. The surgeon met with the patient to discuss the procedure and obtain consent.

The night before the extraction, the surgeon reviewed the patient’s electronic record, and the procedure commenced the next day without complications. However, following the procedure, the surgeon noticed a separate paper chart for the patient.

The paper chart included a letter from the orthodontist with an updated treatment plan that was never entered into the EHR. The new plan recommended removal of different teeth than the original plan specified.

In some instances, provider/staff resistance has led organizations to maintain both paper and electronic systems to meet varying preferences. However, research has shown that hybrid systems decrease efficiency and increase the risk of errors.<sup>6</sup> Although it might be tempting to try to satisfy everyone, it also can be counterproductive and, ultimately, does not support a culture of safety or an environment of cohesive teamwork.

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## Strategies for Implementation/Conversion

- Include providers and staff members who will be using the EHR system in initial research and planning activities.
- For paper-to-electronic conversions, develop a plan for how your organization will handle paper records once the EHR system is implemented. For example:
  - Will staff members scan paper records into the new system?
  - Will scanned documents be searchable?
  - What are the expectations for providers to reconcile old records with new ones during patient encounters?
- For conversions from one EHR system to another, determine the previous vendor’s and new vendor’s roles in information transfer (i.e., contractual obligations and requirements). Consider the following questions:
  - Is any data optimization required prior to conversion?
  - What are the deadlines for data transfer between systems?
  - Will your organization have access to the old system after the conversion; if so, for how long?
- Seek provider/staff input on developing policies and workflow processes that align with their needs as well as the functionality of the new system.

- Support providers and staff throughout the pre-implementation and implementation phases by (a) including them in the decision-making process, (b) maintaining transparent communication; and (c) establishing firm, yet reasonable expectations related to EHR adoption and use.
- Be realistic about the cost (both in external resources and staff time) that it will take to implement the new system.
- Provide training and education during pre-implementation and implementation — as well as after the system is in use — to help providers and staff acclimate to the EHR's interface and functionality, recognize potential process or system problems, and work toward achievable solutions.

For in-depth information about implementing an EHR system and valuable tools to assist in the process, see [Section 1 of the ONC's Health IT Playbook](#) and the American Medical Association's STEPS Forward™ [EHR Transitions](#) module.

## Documentation

Accurate and thorough documentation is the backbone of risk management; it provides essential patient information, historical details about the course of patient care, and a record of services provided.

EHRs are intended to streamline the documentation process, while at the same time capturing more information than was previously possible with paper records. Although using an EHR system may result in more substantive patient information, it also can lead to errors due to specific functions of the system, such as copy and paste; structured and standardized content; and metadata and audit trails.

### Copy and Paste

The practice of copy and paste is a common and problematic documentation issue associated with EHRs, and the practice has been cited in EHR-related allegations.<sup>7</sup> Copy and paste — also called cut and paste, cloning, or carrying forward — refers to electronically lifting information from a previous entry in a patient's record and placing it in the current entry. It also refers to copying information from one patient's record to paste into another patient's record (e.g., boilerplate language).

Automated functions within EHR systems facilitate the cloning of information because of the ease with which users can grab and move content. Practitioners who feel crunched for time may find the copy-and-paste function enticing because it's quick and easy.

Despite the convenience, copying and pasting content can lead to the proliferation of incorrect or nonconsequential information throughout electronic records, which can lead to patient harm if treatment decisions are based on erroneous or old information — or if practitioners are so overwhelmed by “note bloat” that they miss critical information.

Copy and paste also can affect healthcare providers' credibility, both in litigation and with patients. For example, ECRI's report [\*Copy/Paste: Prevalence, Problems, and Best Practices\*](#) relays the story of a physician who, while talking with a comatose patient's family, stated that the patient had only recently had surgery (within the previous days). In reality, the patient had undergone surgery more than a month prior, but the phrase “Postoperative Day 2” had been carried forward in the progress notes for weeks.<sup>8</sup>

Additionally, the use of copy and paste can have serious corporate compliance implications. When information is cloned from encounter to encounter without careful review, healthcare organizations might end up billing for services that did not occur. Even though this type of billing

## Case Example

A patient who had a history of smoking, high cholesterol, and borderline hypertension presented to his primary care office complaining of intermittent numbness in his left hand and mild neck pain.

The patient expressed concern that his symptoms were cardiac related because his brother had recently had a heart attack. The patient's electrocardiogram was normal, and the provider diagnosed the patient with nerve compression.

Several months later, the patient went to urgent care for gout and a persistent cough. The urgent care provider had access to the patient's electronic record, but it did not reflect his recent symptoms or family history of heart attack because it was a duplicate of an older record. The provider prescribed medication for gout and cough and sent the patient on his way.

Nine days later, the patient died. An autopsy indicated that atherosclerotic disease and heart attack caused his death.

error might be a simple oversight, it could lead to allegations of fraud, which may jeopardize reimbursement from Medicare and other payers.

Copy and paste also can have a negative effect on data integrity. One of the broad goals of EHR systems is to facilitate the electronic exchange of health information and collection and submission of clinical quality measures. Inaccurate data resulting from poor practices like copy and paste may have long-term implications for population health studies, disease tracking, data mining, and quality improvement.

### *Strategies for Copy and Paste*

- As part of organizational documentation policies, establish guidelines for when copy and paste is prohibited and when practitioners may use it with extreme care.
- In situations in which copy and paste is allowed, ensure that organizational policy stipulates the need for practitioners to carefully review any information carried forward or carried over in records.
- Reinforce practitioners' responsibility for updating/revising copied information as appropriate and electronically signing each record to verify their review and approval of the information.
- Include in documentation policies a requirement that providers note the source of any information they copy and paste in records.
- Work with your EHR vendor to determine what options are available to track copied and pasted content and make it easy to identify (e.g., with different font color or italics).
- Encourage providers to revise copied and pasted material to remove redundancy and extraneous details.
- Routinely [audit records](#) to check for errors that may have resulted from copying and pasting patient information.
- Educate staff about the dangers and consequences of using poor documentation practices/shortcuts, and provide training on documentation policies and best practices.

To learn more, see the Partnership for Health IT Patient Safety's [Health IT Safe Practices: Toolkit for the Safe Use of Copy and Paste](#).

## Structured/Standardized Content

One of the purported benefits of EHRs is structure and standardization, which is accomplished through functions such as data entry fields, check boxes, drop-down menus, auto-fill, and templates. Although these functions can help generate consistent documentation across providers, poor system usability or user errors can present risks. For example, patient safety might be jeopardized if:

- **Patient matching or identification issues** cause a provider to enter data in the wrong patient record.
- The data entry fields don't match the clinical situation, or the system is unable to account for variations in patient population (e.g., adult vs. pediatric patients).
- The system automatically defaults to a selection of "normal." If all options are not carefully reviewed, the record might indicate a normal value for a condition that was never evaluated.
- The auto-fill function populates incorrect information in a field, and the provider accepts the information without review.
- The provider selects the wrong template, check box, or menu item, which can easily happen when multiple options are presented and time is scarce.
- The provider is unaware of how taking an action within the EHR ultimately affects the physical output of the record.

Undoubtedly, data entry fields, check boxes, drop-down menus, auto-fill, and templates can create efficiencies, but they also can contribute to the domino effect of replicating inaccurate information. An article in *For the Defense* explains that "if one provider puts in a wrong medication, a wrong diagnosis, or an incorrect medical history, the systems are typically designed to keep repopulating and disseminating the erroneous information. Keep in mind that one wrong entry might not stay in the system of origin, but it might find its way to a separate pharmacy, specialist, or outside primary care system."<sup>9</sup>

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Further, overreliance on structured/standardized content can result in records that lack specificity. Without the unique patient narratives that were customary in paper records, it might be difficult to distinguish one patient encounter from the next, creating uncertainty about critical thinking, clinical reasoning, and diagnostic- and treatment-related decision-making.

### *Strategies for Structured/Standardized Content*

- When selecting an EHR system, make sure your organization can tailor it to relevant clinical situations and patient populations. For example, pediatric practices should ensure that EHR systems take into account medication dosing differences for children.<sup>10</sup>
- Be aware of whether your system automatically defaults to a normal setting. If so, carefully review the record at each patient encounter to ensure it doesn't misrepresent clinical information.
- Provide a final quality assurance review of all data you enter and boxes you select in the EHR during each patient encounter.
- Occasionally print out and review records to ensure information is presented in a logical, accurate format.
- In addition to using structured/standardized content, provide patient-specific notes and comments in the record as appropriate and necessary.
- If the system has different screen views based on provider type or role, ensure that all providers are aware of those views and what information may or may not be visible to other practitioners.

## **Metadata and Audit Trails**

As mentioned previously, EHRs present an opportunity to collect more data than possible with paper records — and not just data that reside within patient records. A distinguishing characteristic of EHRs is their ability to collect metadata, or “data about data.” Metadata leave an audit trail that may show information such as:

- Who accessed a record, when they accessed it, and the machine on which the information was accessed
- The date and time that test results were reviewed

- The data and time that a record was modified
- How long a provider had a record open and how quickly they selected various options
- How a provider responded to system-generated alerts or advisories

Simply stated, metadata and audit trails provide an electronic footprint that tracks “each access, update, and action performed by each user . . .”<sup>13</sup> This information can play a pivotal role in malpractice litigation — either by confirming a healthcare provider’s recollection of events or showing discrepancies in a provider’s statements. For

example, if a provider says they documented at the point of care, but the EHR audit trail shows that the majority of documentation was entered several weeks later, the discrepancy might cast doubt on the provider’s credibility — even if the documentation is accurate.

For some practitioners, metadata might necessitate a change in workflow. For example, providers who have typically entered some information into patient records prior to the actual patient encounters will need to adjust their processes. Otherwise, metadata might show inconsistencies in the timing of events. Further, providers should be cognizant of following organizational policies related to documentation timeframes and protocols for amending records.

### *Strategies for Metadata and Audit Trails*

- Be aware of, and educate others in your organization about, your state’s e-discovery statutes or rules.
- Learn how your EHR system’s metadata function works, and develop documentation policies based on that knowledge.
- Ensure that providers and staff members in your practice are mindful of the types of metadata that the EHR system collects.
- Adjust workflow processes as necessary to eliminate inconsistencies in metadata.

## Electronic Discovery

Electronic discovery (e-discovery) amendments were introduced to the Federal Rules of Civil Procedure (FRCP) in 2006.<sup>11</sup> These amendments apply to litigation in federal courts; however, many states also have partially or fully adopted the FRCP’s approach or implemented their own e-discovery statutes or rules.<sup>12</sup>

- Develop guidance for how to appropriately [amend or update EHRs](#). Without a defined policy, changes to a record may raise questions about the validity and integrity of information.
- Consider hiring an outside party to perform an annual audit of your EHR system and provide feedback about the quality of documentation, adherence to regulatory standards, and billing/coding compliance.

## Alert Fatigue

Perhaps one of the most powerful patient safety capabilities of EHR systems is their potential to analyze patient data, provide clinical decision support, and send providers auditory or visual safety alerts (e.g., reminders that patients are due for screening tests or notifications about possible contraindications, such as dangerous drug–allergy interactions). These tools are valuable, but only when they are appropriately designed and implemented.

Unfortunately, “in the current highly computerized clinical environment, an individual clinician interacts with many different alert-generating devices—meaning that every day, clinicians are on the receiving end of a staggering number of alerts.”<sup>14</sup> Systems that bombard providers with an overabundance of alerts can be frustrating and lead to a phenomenon known as “alert fatigue,” in which providers — pressed for time and exhausted by the sheer number of notifications — ignore or override alerts without verifying their clinical significance.

Research suggests that providers often miss, ignore, or do not follow up on safety alerts or notifications.<sup>15</sup>

Although many of these dismissed notifications do not result in patient harm, alert fatigue has contributed to various adverse outcomes and is considered a patient safety hazard.<sup>16</sup>

“Alert fatigue has contributed to various adverse outcomes and is considered a significant patient safety hazard.”

Further, when providers are inundated with massive numbers of noncritical or nonrelevant notices (i.e., low-value alerts), the likelihood that important information will be overlooked increases. After receiving a number of unhelpful alerts, a clinician might bypass the next alert based on the assumption that it is another “false alarm” — when, in fact, it might contain critical information.

To complicate matters, not all alerts that are overridden are the result of providers ignoring the system. Many times, alerts are overridden for valid clinical reasons. However, metadata that capture overrides likely will not distinguish between the two. If metadata are used as evidence in malpractice lawsuits, healthcare providers might have to defend why they overrode alerts.

Addressing alert fatigue requires consideration of the human and systems factors that contribute to the issue “as the problem fundamentally arises from both the technology itself and how busy human beings interact with the technology.”<sup>17</sup>

## Strategies for Alert Fatigue

- Determine whether your EHR system’s alert function can be tailored for your healthcare organization, your overall patient population, and specific patient characteristics (e.g., patients who are at high risk for potential adverse outcomes due to certain diseases or conditions).
- If your organization is in the process of purchasing or upgrading an EHR system, include questions about alert capabilities in the initial research and assessment of products. Carefully consider how each product has applied human factors principles to alert design.
- Ask your vendor whether the system’s alerts can be classified based on severity or other factors, and make sure the different types of alerts are presented in different ways to help clinicians quickly distinguish each type of alert.
- Limit interruptive alerts to only those that are classified as severe.
- Determine whether you can turn off or minimize alerts that are clinically nonconsequential to help reduce alert burden.
- Provide documentation, including rationale, for deactivating certain types of alerts or overriding clinically significant alerts.

## In Summary

EHRs represent both the present and future of health record documentation. With improved design, proper implementation, and careful consideration of how these systems operate, EHRs can provide opportunities to streamline processes, enhance quality of care, and support patient safety efforts.

However, like all types of technology, EHRs aren't without problems and risks. Changes in workflow, poor system design and usability issues, lack of understanding about these systems and their capabilities, user errors and system glitches, and lack of defined protocols can all lead to process breakdowns and errors.

Awareness of the potential risks that EHRs present can help healthcare organizations, providers, and staff proactively address them through ongoing staff training, workflow evaluation, and development of comprehensive policies and procedures.

## Endnotes

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