**Background**

The rapid expansion of information technology throughout healthcare, accelerated by legislation, was expected to improve the quality, safety, and efficiency of care. Early recognition of the possibility of unintended consequences as a result of the implementation of technology into a complex environment has been the key concern in the design of deployment continues. It has become clear that the progressive deployment of electronic health records and other information technologies has increased problems of potential harm. Additionally, the complexity of the implementation process has been suggested, nearly at all phases of this deployment can put patients at risk. Despite the predictions, the development of effective strategies for preventing or mitigating these risks is described. These activities, among others, will be critical in preventing not only outcomes, but also events that can lead to patient harm. Changes in the current systems are critical to us for the purpose of these strategies to minimize those harms.

**Multiple legal issues are involved with the development, implementation and use of EHRs.**

These include:

- Legal issues of records and recording practices
- Legal issues related to improper use (security and safety, training and optimization)
- Improvement barrier to the EHR (false, abuse, changing documentation, etc.)
- Malpractice related to the EHR itself (design, function, training)

Many of these can contribute to changes in the standards of malpractice and liability. Some of these requirements for maintenance of the data, and certification of its correctness. Timely, access to reports, and the presence of both these (if they are necessary) are to a legal process. From this time a legal issue is identified a claim needs, a risk identified, access identified, and the potential for any harm.

- **Direct causes of malpractice from design, implementation, training**
- **Indirect causes of malpractice from design, implementation, training**
- **EHR vendor restrictions may also affect discovery requests to view screens and documents**
- **Production of suitable records that result from hard copy output can be a significant issue.**

**Clinical Content**

- **Selection of useful choices and avoidance of extraneous information**
- **Populated data entry (use and paste functionality)**
- **allowed for entry of extraneous information, repetition of incorrect information, and indistinct information.**
- **Implementation and populated data entry may become a focus of malpractice (where the algorithm correct?)**
- **Was the process easily understood? Was the process reviewed?**
- **Alert fatigue leads to lack of safety and potential malpractice opportunities**

**Strategy**

- **Risk management strategies**
- **Use of a risk management strategy**
- **Risk of medication error**

**Human-Computer Interface**

- **Design**
- **Interface**
- **Drop-down menu**
- **Poor choice selections**

**Copy Paste Functions**

- **Copy Paste functions**
- **Lack of feedback with selection**
- **Lack of feedback with selection**

**People**

- **Training (initial and follow up)**
- **Training available**
- **Poor responders to issue**
- **Lack of training**
- **Lack of correlation**
- **Lack of attention**
- **Lack of autonomy, burnout, fatigue, or stress**

**Workflow/Communication**

- **Schedule environment**
- **Time constraints**
- **Information delay**
- **Data errors**
- **Transitions of Care**
- **Lack of interorganizational data interoperability**
- **Provider/patient interaction**
- **Patient communications and interactions**

**Administration/Policy/Culture**

- **Administrative/Provider relations**
- **Electronic from a patient**
- **Reluctant patient/care group**
- **Lack of follow-up**
- **Lack of provider/care group**
- **Lack of patient/care group**

**System Measurement and Monitoring**

- **Use of EHR and tools to measure improvement**
- **Use of EHR and tools to measure improvement**
- **Risk management strategies**
- **Risk of medication error**

**Organizational Policies, Procedures, Cultures**

- **Electronic documentation**
- **Electronic documentation**
- **Electronic documentation**
- **Electronic documentation**
- **Electronic documentation**
- **Electronic documentation**

**External Rules**

- **Medication error**
- **Medication error**
- **Medication error**
- **Medication error**
- **Medication error**
- **Medication error**

**Regulations**

- **Regulations and policies**
- **Regulations and policies**
- **Regulations and policies**
- **Regulations and policies**
- **Regulations and policies**
- **Regulations and policies**

**Specific examples of claims and relations with EHR:**

- A child was seen over a period of meltdowns and mental illness. During a time that saw on an annual basis, vision delayed diagnosis of lung cancer occurred. Found for the plaintiff.

Patient was taken to the EHR repeatedly for vomiting. After arriving in the vomiting and sustaining a laceration on the tip, was the child dead. Despite the entire reason for the visit noted by the nursing home staff being vomiting, and despite the EHR (pre-initialized) review of systems stated no vomiting or vomiting, the claims provided that they were never informed of the vomiting. Despite the fact that the child was admitted to a hospital with no reports of vomiting, the fact that they missed the diagnosis after two visits with their own documentation stating no vomiting the verdict resulted that they had to miss the diagnosis. Found for the plaintiff.

A child brought to an EHR with a ‘greening’ vomiting and shock was treated as dehydration and transfer to a pediatric facility was not done. This eventually leads to the child’s death. The patient had been before transfer could be arranged after several hour delay. The court rule was signed 24 hours later with an entry stating stop gastric content. However an investigation found that the child was still alive dying for lack of evidence to the jury that the defendant knew or should have known that this was an urgent problem. Found for the plaintiff.

**Recommendations**

Transitions from paper to electronic and downsizing EHRs to have been quickly and confidently. Protocols to accomplish this are imperative. Transitions of care, coordination of care, and attribution of responsibilities need to be carefully delineated and monitored so that critical needs do not get lost or forgotten.

Design—Careful attention to how an interface is designed, menus and options are defined. The use of the interface must be simplified and made-easy and flexible to accommodate for chaotic environment and to protect rather than disrupt the patient/provider relationship.

Implementation— care must be taken when planning and introducing EHRs and other Health Information Technology to account for the socio-technical environment it will be placed into. This is complex and varies according to place and time, however if not incorporated, it can lead to major safety and liability risks.

**Singh H, Murtagh SS, Federico F, et al. Randomized Trial of Reducing Ambulatory Malpractice and Safety Risk: A clinic visit was completed without access to radiology results, and as no notice of a lung mass seen on the x-ray was given, pathological diagnosis of lung cancer occurred. Found for the plaintiff.**