

# THE APPLICATION OF ELECTRONIC MEDICAL RECORDS IN HOSPITALS: A GENERAL OVERVIEW

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**Abstract:** *As hospitals switch from traditional processes to electronic recordkeeping, the use of health information systems is expanding quickly. Health information systems are cutting-edge products designed to improve effective healthcare delivery. Electronic medical record (EMR) system adoption comes with a long list of benefits, including better patient care, higher-quality paperwork, and better record-keeping, but there have also been unanticipated side effects. Inadequate EMR system design and excessive complexity can result in EMR-related errors that endanger the privacy, confidentiality, and security of the data in the EMR, creating a significant backlog in converting older paper medical records to electronic format, incurring high costs, and depriving end users of IT skills. These unexpected dangers could also encourage hoaxes and improper handling, which would have major legal repercussions. This study aims to examine any potential dangers or problems that can arise from using electronic medical records in hospitals. EMR systems pose risks to patient care, which are examined in this literature review along with suggested remedies for EMR-related mistakes. This review of the literature on EMR risks aims to stimulate further investigation into these potential risks, their implications for patient safety and care quality, and possible mitigation measures.*

**Keywords:** *electronic medical record, health information system, healthcare, risks, patient care*

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## **Introduction**

Informatics and communication technologies have advanced rapidly in these millennium years. Internet use became more common since it made it simpler to obtain social media content. In terms of health, most medical institutions have widespread Internet connectivity. In order to achieve universal health coverage, informatics and communication technologies are being used in the healthcare industry. To improve the surveillance and health information system for all populations, including patients in remote areas or underserved communities, the World Health Organization (WHO) advocates for creating an environment conducive to the use of informatics and communication technology (eHealth, 2015).

Technology progress has aided in the creation of digital, electronic information storage techniques that are more advantageous to businesses. The transition from paper to digital records has had an impact on most industries, and the medical industry is no different. Electronic medical records (EMR) have taken the place of conventional paper medical records in storing patient information. EMR or computerized patient record informatics, is described as an "evolving computer-based document containing various forms of patient's data routed through a healthcare system" (McGraw Hill, 2002). Medical information about the patient would include the patient's presenting complaints, diagnosis and the investigations that have been done during his visits to the healthcare facilities. EMR also keeps track of data needed for insurance and the billing process. EMR is as "a digital version of the patient's manual or paper chart and represents a medical record for a single facility, such as the family doctor, group practice or hospital" (Appleby & Tarver, 2006).

The history of medical records is thousand-year-long, with earlier roots in ancient civilizations. The paper has been used to record medical data since the early 1900s mainly serving educational purposes, later assuming other roles such as in insurance or legal procedures (Lorkowski J & Pokorski M.(2022). A few decades later, computer technology had advanced and was the EMR's mainstay. EMR was subsequently adopted by other healthcare organizations with the aim of facilitating research and enhancing patient care. With the development of computers and local area networks, which can enable faster access to information, the drawbacks of paper medical records become increasingly apparent.

## **Benefits of EMR application in the hospital**

### **Resolving issues with paper-based record keeping.**

The operation of hospitals will greatly benefit from removing storage problems. Service demand will inevitably rise as a hospital is open longer, and space demand will follow. As its management grows more expensive each year, paper-based systems are characterized as cost-centric (Choi, Lee, & Rhee, 2013). Decreased paperwork means huge support to environmentalists, and no more unnecessary duplication of test results, or any other patients' data since everything can be transferred to a USB drive should a patient move, and the need arise to switch health providers. Flood, fire, and theft are better protected by EMR. Data backups are stored on servers that are situated remote from the health facilities. This also reduces the risk of missing or misplaced data. Protection from theft is affirmed by encryption and password, denying access by unauthorized personnel but at the same time easing those who

do. EMRs have been proven to improve the quality of care and patient outcomes by keeping healthcare providers better informed, improving the workflow process, improving communication between clinicians, improving compliance with best practices, and reducing medical errors (Akwaowo, C. D et al.,2022).

#### **Easily access to patient medical records.**

With only one click of a button, a patient's whole medical record is accessible. History from birth to the present can be provided, and since this information came from a variety of sources, a reviewing physician has a better chance of not overlooking any details or hints throughout the diagnostic procedure. Instead of having to wait for a physical paper result, different departments can quickly interact, cutting down on the amount of time it takes for a result to reach the ordering doctors' attention. This enables current and comprehensive patient information to be available at the time of care, ensuring a more precise diagnosis, efficient treatment, and better outcomes. These are probably the factors that contributed to the result of a study conducted in Taiwan that showed inpatient mortality rate and 14-day readmission rate during the full EMR stage were reduced compared to no EMR period (Lin et al., 2020). The quality of the data depends on how they are entered into the EMR system. When deploying an EMR, information and system quality must be considered. For the end user to be satisfied with the EMR, information quality must be ensured, including the accuracy and completeness of the data entered, simple information access, ongoing data availability, and confidentiality of the health data (Gopidasan, Balaji et al.,2022).

#### **Enhance productivity and quality of care.**

EMRs that are properly managed can reduce the amount of time needed for patient consultations and management (Manca, 2015). More patients can be seen in a single session. EMR can also offer tools and information to point healthcare professionals in the direction of the best course of action for the varied conditions they encounter. Medical records, summary charts, and consultation letters give specialists and the rest of the patient management team a structured and understandable source of information. EMR improves treatment quality in a variety of ways, including checking for medication interactions and ensuring that rules are followed (Gopidasan, Balaji et al.,2022).

#### **Interoperability**

The capacity of a system or piece of software to communicate data is referred to as interoperability. Healthcare professionals can evaluate patients' data anytime, anywhere within the organization thanks to the sharing of electronic information. Prescriptions can be sent directly to the system thanks to a connection with the pharmacy department. It lessens the possibility of error when a prescription is put down on paper. The adoption of a decision support system (DSS) in the management of drugs, test results, and diseases, as well as the existence of alert flags and reminders, increases the security of the working environment (Mohd & Syed Mohamad, 2005). The realization of an electronic health record (EHR) should be the goal of any institution or organization implementing an EMR. In the presence of EHR, in a remote area where the specialty is scarce, distant consultation can be made available to review certain cases.

#### **Allow research and study.**

Data are accessible using EMR seven days a week, 24 hours a day. The data may be shared among numerous authorized researchers at any moment. Information analysis is facilitated by systematic, integrated data storage. There is no debate about the significance of data protection for an accurate, valuable research process and study outcome.

## Potential risks in EMR application

### **Acceptance of EMR among physicians and healthcare professionals.**

Despite the EMR's installation having a considerable positive impact on patient care outcomes, adoption rates are still low. Resisting change is a human problem (Al-Adwan & Berger, 2015). The five most frequently cited impediments to EMR adoption, according to a review of the literature (Dutta & Hwang, 2020), are privacy and security concerns, high start-up costs, workflow changes, system complexity, lack of reliability, and interoperability. Each of these elements needs to be examined and clarified. The empirical study from Jordan (Al-Adwan & Berger, 2015) highlighted the importance of human issues in determining whether doctors and other healthcare professionals will embrace or oppose the introduction of the electronic system. It also highlighted the fact that many organizations fail as a result of human resistance and a failure to appreciate the significance of the system. Making the use of EMR compulsory has a big beneficial impact and requires dedicated senior management to support it. Much importance must be considered in the physician's perception of usefulness and ease of use by the management and developers during the implementation of EMR. Additionally, they need to be aware of any potential usage barriers.

### **Security and privacy risks.**

Physicians disagree on whether the EMR might permit unauthorized access to the data kept in the system. If this is the case, patient-physician confidentiality is in jeopardy, which could result in legal issues in addition to patient loss. According to a US news report (Humer & Finkle, 2014), medical records have had the highest amount of security breaches, with computer networks being entered into and personal information being taken. Malicious code is just one of many potential weaknesses in electronic systems. To do this, hardware and software flaws must be fixed to lessen vulnerabilities. Risk and control can be balanced to safeguard the system and keep operations going. Medical records frequently include accurate and sensitive personal information as well as private communication between doctors and patients. Due to their involvement in diagnosis, hospitals and doctors are particularly concerned about this. Identity theft may be committed using stolen medical records (Yi, 2018).

### **High start-up cost and technical issues.**

As with most new technologies, the cost is a barrier (Gopidasan, Balaji et al., 2022). Unexpected costs may arise throughout the deployment process and for EMR components including hardware setup, software costs, implementation support, staff training, ongoing network fees, and maintenance. Even though it may not be a big deal to the government or large institutions, it will have a big impact on the EHR's goal, which is to establish nationwide interoperability among all health institutions in the nation. However, a study from Korea (Choi et al., 2013) showed that implementing an EMR is still cost-effective even when the qualitative advantages and the paper-based system's cost-centric nature are not considered. However, this will not be the case until the system has been fully implemented, which could take 4–5 years. The organization should create a backup plan in case productivity decreases during the first one or two years. Technical team support will also need to be considered while training employees, which can be difficult in a small clinical setting.

### **Interoperability.**

It is the system's capacity to enable the exchange of electronic data with other healthcare professionals or with the HIS they employ. There are numerous software packages available from various vendors, and no one software package can meet all the hospital's requirements.

Since each vendor has their own area of expertise, problems with software packages from numerous providers are still unresolved in Malaysia itself (Mohd & Syed Mohamad, 2005).

## Conclusion

The biggest development in the healthcare sector is the use of EMR in place of paper medical records. It has altered the way we think about medical data and offers many advantages for maintaining the patient's information in an organized manner. However, there are several risks that we need to overcome to optimize the usage of EMR in the healthcare industry. Several scholars have undertaken numerous interventions to find solutions for all the problems. As a result, there are no restrictions on the use of the EMR, especially in terms of confidentiality. Therefore, guidelines and regulations must be in place with the implementation of EMR to ensure its benefits in delivering safe healthcare services. Furthermore, the government should make the required efforts and take the necessary actions by allocating more funding to all hospitals to improve the healthcare system, particularly by implementing the EMR, despite all the risks and difficulties anticipated after EMR has been adopted.

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