A Review: Electronic Medical Records (EMR) System for Clinical Data Storage at Health Centers

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Abstract: With a growing population and an increase in the number of patients, the pressure on doctors and hospital staff has increased severely. At first, traditionally when a patient used to visit hospitals, his information was stored on papers. The use of information technology in healthcare brought a revolution in capturing data of patients. EMR is a collection of data of a patient in electronic format for medical care. It helps doctors as well as hospital staff to provide better care & service for patients as it has all the information about the patient past visit, medications, and lab reports etc. In this paper, we review EMR implementation and EMR tools used in various hospitals in different countries. Also, impact of EMR on administrative staff, physicians, nurses etc., and identifies the benefits, limits, and importance of EMR for clinical data storage and research. Conclusions are drawn.

Keywords: Healthcare, EMR, electronic format, medical care, patient, doctors.

1. Introduction

In a traditional medical record system, the patient’s information is stored in given ways below:

1) Paper-based system: Every test, medication, and visit for a patient is manually recorded on paper. These records are called charts. Each department of the hospital has its own set of records. In traditional system, security of the data is the main concern. Traditional system requires space, cost and time.

2) File system: The complete patient record is maintained in a single file on the computer. Traditionally patient records in the hospitals were kept in the form of written documents. One of the most important developments in the medical practice was use of computers, later on, the internet.

The electronic medical record (EMR) has become one of the most important new technologies in healthcare. It’s an application that is a complete repository of patients’ clinical documents. It contains patients’ medical history, the summary of all visits, observations and treatment rendered within a Care Delivery Organization. EMR most focuses on improvements in efficiency, patient experience, and care. There has been an increase in the use of electronic systems for capture of data in clinical research and trials.

Types of EMR: Based on the technical feasibility, EMR is classified into various types namely, SaaS Based, Client Based & Hybrid Model. Depending upon practice...
requirements choose the best suiting EMR by consulting with the solution provider.

Features of EMR:

- Legibility of notes
- Great features corresponding to charts
- Drug & allergy interactions
- Electronic Prescriptions
- Disaster Recovery
- Faster accesses to records
- Less storage space
- Security of information
- Any time, anywhere accessibility
- Easy to manage as compared to paper based records
- To capture data at the point of care
- To support decision making

Challenges:

- Attitude towards IT adoption
- Security and privacy issues
- Transferring paper based information into electronic (EMR) format
- Long implementation time
- Employing the right team

2. Review of Literature:

The medical record is the heart of clinical care and it is poorly maintained in Indian clinics today. The majority of doctors do not even bother to store and keep their patient’s medical records, they just write down their opinion on their letterhead and hand it over to the patient without even a mention made of the diagnosis. If Indian doctors understand the clinical importance of keeping good quality medical records. Most often, a patient’s record is just a folder with the patient’s details and photograph on the front cover and sheets of data recording previous visits inside. Basically EMR i.e. Electronic medical record is a computerized medical record created in an organization that delivers care, and make records in an easy, safe and smart way. An Electronic Medical Record is a secured electronic file of patient history, medical transcription notes, billing information, and all other information necessary to have a complete patient profile. Health information technology (HIT) is engineered to promote improved quality and efficiency of care, and reduce medical errors. Healthcare organizations have made significant investments in HIT tools and the electronic medical record (EMR) is a major technological advance. Reviews the literature and presents the current status of and forces influencing the adoption of EMR in the office-based practice in the US, and identifies the benefits, limitations, and overall value of EMR in the conduct of outcomes research. The concept of Microsystem can make a great contribution in improving EMR practices among healthcare professionals in the Malaysian government hospitals. It is believed that healthcare today is sought, created, delivered and purchased at the level of the clinical microsystem. It is there that real gains in the quality, value and patient care can occur. Furthermore, the implications of Microsystems framework for the improving of EMR practices are much broader than just a given microsystem and the people working within it. Innovations are introduced to provide a better system of care but there are unintended consequences that can enhance or disrupt positive systems. The electronic medical record has disrupted the practice of bedside report on this general medical unit; detracting from a practice intended to support patient centered care. Understanding the impact of implementing the EMR in the context of the existing practice of bedside report provides staff on the unit with the opportunity to evaluate the issue and determine if further changes are warranted. It estimates potential savings and costs of widespread adoption of electronic medical record (EMR) systems, models important health and safety benefits, and concludes that effective EMR implementation and networking could eventually save more than $81 billion annually—by improving health care efficiency and safety. Physicians in all specialties are beginning to understand and appreciate the benefits of using computers in their clinic practice. Implementation of an EMR in an orthopedic practice is part-ularly challenging and requires considerations to orthopedic-specific needs. In deciding what EMR systems to develop and deploy in developing countries, promising ideas are not enough: they need to be validated in the field. The developing world faces a series of health crises including HIV/AIDS and tuberculosis that threaten the lives of millions of people. Lack of infrastructure and trained, experienced staff are considered important barriers to scaling up treatment for these diseases. In this paper we explain why information systems are important in many healthcare projects in the developing world. We discuss pilot projects demonstrating that such systems are possible and can expand to manage hundreds of thousands of patients. We also pass on the most important practical lessons in design and implementation from our experience in doing this work. Finally, we discuss the importance of collaboration between projects in the development of electronic medical record systems rather than reinventing systems in isolation, and the use of open standards and open source software.
This paper presents an ethnographically inspired interpretive case study of the Electronic Medical Record (EMR) system at Sankara Nethralaya hospital in India. It presents challenges related to the adoption of the system and methods and strategies that were utilized in order to overcome these challenges and help the system be adopted successfully. One of the more notable challenges at the hospital was a user base that included skeptical users, those lacking computing skills, and that had a history of rejecting designs. Electronic Medical Records enhance patient care, however, the benefit may be difficult to quantify at this stage. But with the increasing role of Health Insurance as payers, the increasing demand from informed patents for transparency and the ever increasing use of technology like Telemedicine etc. in the delivery of healthcare, I would recommend to healthcare providers to look at EMR adoption not from a ROI (Return on Investment) perspective but as a TINA (there is no alternative) factor. Successful use of EMR makes legible use of data, secure patient identity, online real time retrieval, quicker decision making, quicker results in patient treatment and management, and easier use of patient information. With a special interest in ICT applications in healthcare, Gp Capt (Dr) Sanjeev Sood shares insights into the electronic medical records implementation status in India. Studies on the adaptation of Electronic Medical and Personal Health Records in developing countries are scarce. There are sharp differences between barriers to adaptation and implementation in developing countries to that of developed countries. This paper examines the challenges faced by developing countries toward the development, progression and sustainability of Electronic Medical Records. The paper also provides a review of implementation of varying types of electronic medical data management systems in developing countries. A study of small- and medium-sized physician practices found that electronic medical record (EMR) systems can help coordinate patient care within practice offices. However, because of interoperability issues, they are less able to support coordination between clinicians and across settings. Other challenges, like information overflow and reimbursement, also impede physicians’ ability to use EMRs to improve patient care and coordination. User satisfaction with an electronic medical record (EMR) plays a decisive role in its implementation and subsequent use. We developed a survey tool to identify features of an EMR that contribute to user satisfaction and administered it in an adult primary care clinic. Most physician respondents were highly satisfied with the EMR and used all of its components. The EMR decreased the time to develop a synopsis of the patient and improved communication efficiency. Most respondents valued remote access to the EMR. Electronic messaging was an important component of improved care delivery according to 80% of the respondents. Access to online references within the EMR was not valued over web-based access for most respondents. Our results demonstrate acceptance of an EMR in adult primary care. Features such as remote access and electronic messaging were surprisingly useful and successful for primary care practice. Most countries in Europe and the USA are increasingly using an electronic medical record (EMR) to help improve healthcare quality. Unfortunately, most developing countries face many challenges ranging from epidemics and civil wars to disasters: they also lack a robust healthcare infrastructure in the form of information and communications technology (ICT) to ensure continuity of patient health which many research studies consider a lifesaving resource. The aim of this systematic review is to examine the benefits of an EMR and its contribution to the development of healthcare delivery in developing countries. By taking advantage of data stored in EMRs, efficiency and quality of care can be improved through clinical summaries, even in settings with limited resources. The computer-based electronic medical record (EMR) is an essential new technology in health care, contributing to high-quality patient care and efficient patient management. The majority of southern European countries, however, have not yet implemented universal EMR systems and many efforts are still ongoing. We describe the development of an EMR system and its pilot implementation and evaluation in two previously computer-naïve public primary care centres in Cyprus. This article examines EMR system efforts, benefits, and barriers, as well as steps needed to move the US closer to a nationwide EMR system. The analysis includes a blueprint for implementation of EMR, industry comparisons to highlight the differences between successful and non-successful EMR ventures, references to costs and benefit.
Information, and identification of root causes. Electronic medical records (EMR) systems could help increase the efficiency and efficacy of these clinics. Even though some EMR systems have been developed for developing countries, they lack customizability. This paper gives some background information about EMR systems: how they are used in developed countries, and how FileMaker, an off-the-shelf database software, could be used to rapidly deploy EMR systems in clinics and hospitals of developing countries. We show that an online clinical data management service can improve data quality in a developing country setting. In the future we expect to see both less loss-to-follow-up and better treatment programmes with help of this CTDMS. For better and more efficient medical care programs and studies in developing countries we believe an online data system is essential. The EMR implementation problems in Jordan, and consequently providing well-informed inferences for decision makers to take into considerations for yielding better EMR implementation. This paper discusses the factors which are recognized to be the challenges in the implementations of EMR in hospitals. The paper also describes advantages and history of EMR. This paper will also describe the Method (the sample) to test of the Hypotheses and final result. Obvious problems with EMRs, such as loss of productivity and long training times, have deeper causes. These stem from the complex interaction of highly skilled physicians trying to complete complex tasks in a challenging work environment with a complex and not always usable medical information system. Yet, by applying user-centered design in this complex environment, usability professionals can contribute significantly to improving EMR usability. Greater productivity and lower costs with better health care may yet be our destiny. The diabetes electronic medical record (DEM) has emerged as an effective information management tool with the potential to improve diabetes care and research. This study reports on the usefulness of the DEM system at Dr. Mohan’s Diabetes Specialities Centre (DMDC), Chennai, India, for clinical and research purposes. The DEM helps track diabetes care and is a valuable tool for research. The use of the EMR in a clinical setting is increasing throughout all fields of medicine and in clinical practices, private or academic, large or small. As more academic centers begin to implement electronic systems, the question of how to handle clinical research in the electronic environment becomes increasingly important. There has been much discussion of how to integrate the EMR and EDC to facilitate research, and organizations like the Clinical Data Interchange Standards Consortium (CDISC) will be pushing for EMR and EDC technical development in the future. SAS Enterprise Miner and SAS Text Miner can be used to explore the electronic medical record to determine differences in physician decision-making. Once the differences are found, they can be presented to the physician decision-makers so that treatments can be optimized, protocols can be developed, and patient care can be enhanced. Still other techniques, such as HPF, can be used to investigate other aspects of patient care. The improved documentation in the electronic medical records needs to be examined to improve patient care and to decrease cost.

3. EMR Accessibility & Security:

One purpose of electronic medical records (EMRs) is to increase the accessibility and sharing of health records among authorized individuals. Privacy of information collected during health care processes is necessary because of significant economic, psychologic, and social harm that can come to individuals when personal health information is disclosed, we examine the extent to which fears of the loss of privacy due to EMRs are justified, and we discuss measures to protect the security of health data. We also consider the trade-offs between accessibility and security of EMRs compared with paper records. Authentication and authorization provisions provided for accessing the information in EMR, but here in study, we showed that none of three standard access control model, DAC, MAC and RBAC are adequate for EMR system in isolation. Here we explained how a careful combination of all three access control models can provide the privacy requirements needed for an EMR system. However I isolation we assume that patients are able to adequately understand and manage access to their EMRs. We assume that a medical authority will be responsible for determining what medical data that patients are allowed to have control over in order to ensure the patient’s EMR will present the required information that a medical practitioner needs to do his medical job. In our work to date, we have not yet validated the security of our model by accessing it against adversary models, e.g. a malicious healthcare worker. However this work can be carried out as an extension to the work presented here.

4. Conclusion:

In India Doctors are still reluctant to EMR usage, mainly because of the attitude of the people. They do not want the doctors to look into the computer or take down
notes while consulting them. It is widely believed that broad adoption of electronic medical record (EMR) systems will lead to major health care savings, reduce medical errors, and improve health. Barriers to adoption include high costs, lack of certification and standardization, concerns about privacy and who profits from them. It is better to understand the role and importance of EMRs in improving health care and inform government actions that could maximize the benefits of EMRs and increase their use. There must be a serious effort taken for educating the medical community in India about benefits of an electronic medical record system.

References


