A Study on Computerization of Medical Record at a Corporate Hospital

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Abstract:-
Despite the growth of health information technology the medical encounters are still documented on paper based medical record. Most paper based medical records which are used today may pertain disorganization, illegibility and inaccurate entries. The medical record is an important tool supporting quality in clinical care; it is today used by personnel trained in different healthcare disciplines, working in different healthcare settings, on different sites and in different languages. There are common factors that impede the adoption of electronic medical record which include start-up costs, initial weeks of using a new system, Systems complexities and other hindering factors. The purpose of the study is to identify the process involved in computerization of medical records, examine the potential benefits of computerized medical record and its contribution for improving health care delivery. The study also focuses on details about hardware, operational procedure and other important facts pertaining to computerization of medical records.

Key words: Medical record, Information Technology, Computers Technology.
Introduction

Despite the growth of computer technology in medicine most clinical encounters are still documented on paper based medical record; this may lead to disorganization, illegibility and inaccurate entries and sometimes loss of files (James L. Rogers and Olga M. Haring, 1979). The traditional paper based record is still used due to its familiarity to users, portability, ease of recording “soft” or “subjective” findings and its brows-ability for non-complex patients. There is also a sense of ownership of paper based records, due to their being only one copy, which increases the sense of security. One effect of this reassessment has been a burgeoning of electronic medical record system (Richard S. Dick et. al (1991), William R. Hersh (1995)).

Waegemann in 1996 has classified five levels of Electronic HealthCare Record (EHCR) which can be distinguished as Automated Medical Record is a paper-based record with some computer-generated documents, Computerized Medical Record (CMR) makes the documents of level one electronically available, Electronic Medical Record (EMR) restructures and optimizes the documents of the previous levels ensuring inter-operability of all documentation systems, Electronic Patient Record (EPR) is a patient-centered record with information from multiple institutions. Electronic Health Record (EHR) adds general health-related information to the EPR that is not necessarily related to a disease (Waegemann C.P, 1996).

The health record is an important tool supporting quality in clinical care. It is today used by personnel trained in different disciplines, working in different settings, on different sites and in different languages. These include: patients themselves and their appointed careers clinicians in therapeutic or anticipatory care roles, groups of clinicians working in primary or secondary care, paramedical colleagues working with the patient, clinicians and clerical or research staff undertaking clinical audit or quality assurance, hospital, general practitioners, healthcare managers and healthcare purchasers (health authorities or insurers) undertaking quality assurance, healthcare planners at hospital, district region or national level, legal advisors for the patient or the clinician, clinical researchers, medical students and medical teachers, commercial product developers for market research (e.g. the pharmaceutical industry), insurance companies for determining payment, health economists and journalists. Just as there will be many different parties by whom it is accessed the record can play many
roles in the provision of care to individuals and to populations (Kathryn J. Hannah 2006).

There are common factors that impede the adoption of EMR in practices they are early start-up costs, the initial weeks of using a new system, Systems complexities pose challenges in achieving interoperability, physicians spend more time seeing patients and using the new EMR, spend quite a bit of time preparing the system for use in their offices working for longer days, The physician or the office staff will have to set up screens, options, methods of documentation, and order entry, the configuration of hardware and software, lack of data exchange. Predictions based on statistical models suggest that Health Information Technology has the potential to assist in dramatically transforming the delivery of health care, making it safer, more effective and more efficient in the future (Michael R. Ripchinski and Dwight O. Eichelberger (2008))

Methods
The study was conducted at a 550 bedded tertiary care hospital which is operational from 1983 which is accredited by Joint Commission International and serving the population of Hyderabad and Secunderabad. The present study is exploratory in nature it is conducted to identify the process involved in computerization of medical records, the hardware details, architectural details, examine the potential benefits of CMR and its contribution for improving health care delivery. It is largely descriptive and categorized as a non-experimental qualitative study. The data is collected through structured interviews which were conducted at IT department and medical records department. The data is analyzed by Matrix Analysis which is in the form of flow charts, diagrams and pictorially representation as well as written descriptions.
Discussions

The research work resulted in the following explanation.

- After discharge the complete Patient Record from inpatient, outpatient and emergency departments are sent to Medical Record Department.
- Then each Patient’s record which has a UHID number (Unique Hospital ID) is assembled and compiled as shown in Figure 1

Figure 1

How computerized medical records are generated at the hospital?

- Computerization of medical record started in the year 1995.
- The Computerization of Medical Record is done through 3 Tier Architecture of an Enterprise Hospital Information System.
  1) Application Server
  2) Database Server
  3) Domain Server
- The complete Computerized Medical Records system and all the operations of the Hospital are based on the Application Server
where all the functions with accessibility are carried out.

- Database Server is the system where all the data gathered through all the departments is accessed and retrieved.

- Domain Server is the system where all the data is saved, stored at one place. This server acts as a backup for all the data acquired through different departments of the hospital.

- All the Records are automatically stored in the database server department wise, whose backup is stored in the domain server which is at IT department.

- The earlier software that was supporting the operations in the MRD was Wipro based software that had been replaced by Tata Consultancy Service software solution Med Mantra.

- The In-charge person of respective departments of the Hospital has access to the records. These records can be accessed by the IP-Track-No given to the patient with respect to his/her last visit. Sharing within the hospital departments is done with the EHIS (Enterprise Hospital Information System) Software.

- All the information is shared to a single server from any branch through an authorized login ID. If the main server goes down then backup server automatically switches on and it acts as main server and the process of storing of files is continued.

- The Unique Hospital ID (UHID) generated is unique for the patients all over India. (E.g.: UHID – APJ1.0001471228) When the patient is admitted in the hospital he/she is given UHID as well as an IP No. (Eg: IP73226) , The Computerization of Medical Records provides safety and privacy to the patient’s health record; this is because of the involvement and improvement of Information Technology in the Health Care Industry.

- The computerized files are stored in JPEG Image Format.
Figure 2  Process of Computerization of Medical Records

- The Organization is using HP Flatbed Scanner to Scan the Patient Medical Records.
- Before scanning the Medical Records the respective Doctor is asked to attest it with the signature. Then the files are Scanned and uploaded in the Database of EHIS which is based on the details of the patients.
- Mere like an updated Computerized Medical Record, the manual records are stored in the Database EHIS Server in order to make it compatible and available from any department of the hospital.
- The uploaded file can be retrieved as similar to the computerized medical record system, but the difference is the user will access the attached file rather than a computerized record.
- The manual medical record is kept in the MRD itself for reference as it is important to maintain in case of legal cases.
Conclusions

The growth of computer technology has influenced various medical and health related disciplines but medical encounters in healthcare setup are still documented on paper based medical record. The traditional paper based record is still used due to its familiarity to users, portability, ease of recording “soft” or “subjective” findings, and its brows ability for non-complex patients. The health record is an important tool supporting quality in clinical care used by personnel trained in different disciplines, working in different settings, on different sites and in different languages. There are five levels of computerization of Electronic HealthCare Record .The study has detailed the process involved in computerization of medical records emphasizing on the potential benefits and its contribution for improving health care delivery. The existing records that are manual are computerized and stored in JPEG Image Format .The Computerization of Medical Record is done through 3 Tier Architecture of an Enterprise Hospital Information System. Application Server carries all the functions of accessibility, Database Server captures data gathered through all the departments it can be accessed and retrieved. Domain Server is the system where all the data is saved and it also acts as a backup.

List of Abbreviations

CMR -Computerized Medical Record
EHCR -Electronic HealthCare Record
EHR- Electronic Health Record
EHIS- Enterprise Hospital Information System
EMR - Electronic Medical Record
EPR- Electronic Patient Record
JCI- Joint Commission International
JPEG-Joint Photographic Experts Group
UHID- Unique Hospital Identify

Competing Interests

The authors declares no competing interests

Authors’ Contributions

The entire work has been carried as an original research. There has been a serious effort to make the research fit to the purpose and be useful for further reference.

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