

Notes and Communications

Electronic Health Records in Health and Disease

N. K. Tyagi* & J. B. Prasad**

Abstract

Electronic Health Records (EHRs) with portability facility were first developed in the United States of America and France to (i) empower citizens for health, (ii) enrich health personnel for diagnosis and treatment, and (iii) making available EHR for the judiciary. National Digital Health Mission (NDHM) is the legislation adopted by the Government of India for uplifting the health standard of the citizens in the line with the developed countries. Each health institution/healthcare provider needs to adopt Medical Data Management System (MDMS) to enhance the quality of healthcare and quality teaching, and to increase research in healthcare as a part of NDHM. As India is adopting EHR under the National Digital Health Mission, this note discusses the requirements for adopting centralised EHR.

Keywords: EHR, MDMS, NDHM, portability, benefits of electronic health records.

Introduction

Electronic Health Records (EHRs) as envisaged in National Digital Health Mission (NDHM) of India with portability of Health Records (HRs) on the line of the developed countries is expected to be a boon for healthcare providers, research, drug delivery system and judicial forensic evidence. The need for maintaining EHR is expected to generate detailed HRs from birth onwards at all levels (*Firstpost*, August 17, 2020). The first EHR was developed in mid-1960s in the USA as 'Clinical Information System'. It was improved by successive vendors to allow higher flexibility and speed (Dick et al., 1997; Amatayakul, 2007).

In USA, HRs are used since 1970 after the invention of Main Frame Computers. Before 1980, the use of EHRs was not common as the computers were main frame, too big and costly. After 1980s the desktop micro-computers came into existence, and the use of the micro-computers became utility machines for record keeping, data retrieval, data analysis and generation of reports including research documents. In the beginning, the use of computer-based EHRs was limited to administrative purposes and maintenance of International Classification of Disease data (*Net Health*, July 24, 2016). After 1995, the use of internet services became a reality and internet-based EHRs were adopted by USA and some other developed countries as the national policy by political resolve and judiciary and bureaucratic support (Grady, 2012).

During 1990s and 2000s, portability of health records was discussed and implemented successfully in USA which benefited healthcare providers and health facility users including enhanced use of medical records for judiciary, healthcare and medical research (Amatayakul, 2007). During 2000-2009, the USA government made a law for using EHRs even by health practitioners by providing them with incentives (Gordon, 2009; Atherton, 2011).

* N. K. Tyagi, Professor and Head, Department of Epidemiology and Biostatistics, KAHER, Belagavi 590010, Karnataka. Email: nareshktyagi@gmail.com

** J. B. Prasad, Assistant Professor, Department of Epidemiology and Biostatistics, KAHER, Belagavi, 590010, Karnataka. Email: jbiips12@gmail.com

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After 1990, computer-based EHRs became a permanent feature in both developed countries and developing countries. However, EHRs are still in an infancy stage in India as they are used mainly by few big government medical institutions and private/corporate hospitals with protected environment. At present EHRs are in use in few medical institutes like All- India Institute of Medical Sciences, New Delhi, Postgraduate Institute of Medical Education and Research (Chandigarh), Sanjay Gandhi Postgraduate Institute of Medical Sciences (Lucknow), MGMIS (Sewagram), CMC (Vellore), etc. As EHRs of these institutions are decentralized, it marginalized the utility of EHRs. However, as per the USA standards and law, there is a need to have centralized EHR system along with complete portability of health records for better healthcare management, judiciary and health research. The digitization of patients' records is to provide the best possible health services within the means of community and available technology as envisaged in National Digital Health Mission (*Firstpost*, August 17, 2020).

Priority attention points

These points under NDHM are: (a) orientation of health service providers to the use of EHRs; (b) generation of executable evidence needed for patient healthcare, drug delivery, valid judicial need, health and disease research at national, state and health institutional levels; (c) creation of hardware and software facilities to fulfil first and second points to meet the needs of primary to tertiary healthcare; and, (d) creation of genuine birth, death and health registration system within EHRs.

Orientation of health service providers to use of EHRs

Health services are divided in three groups as primary, secondary and tertiary. At each level, as per the duty of health personnel, data entry routines need to be prepared along with training in using software, updating software and health records keeping intact confidentiality of the records. A system needs to be created to arrange periodical training for health personnel, maintenance of software and hardware at all health service levels along with sufficient manpower support, stores and finance.

Generation of executable evidence

To generate executable evidence, a system and manpower with proper periodical training along with practice and assessment needs to be created at all levels of health delivery system. Rules and regulations along with enforcement of evaluable, verifiable and friendly system need to be generated with soft and hardware support.

Drug delivery: For this, with the patient's health ID, individuals can download a list of drug distributors and procure medicines on competitive prices by uploading valid prescriptions. Necessary periodical software training needs to be arranged and maintained for the drug distributors / pharmacists for efficient drug distribution and maintenance of proper store records as required by law.

Valid Judicial need: As all health records are expected to be retrievable, the system is likely to be efficient and useful for judicial use. However, software training and hardware maintenance are necessary for the judiciary.

Health and disease research at national, state and health institutional levels: Qualitative research in terms of quality of health services and socio-cultural make of the community is multifactorial and sectorial and hence needs action-oriented research. For quick action timely reporting, data analysis and feedback are the key to maintain health records as the diseases are infectious, pathological and lifestyle in nature, and therefore Medical Data Management System (MDMS) must have enough provision for the same.

Data quality and timely retrieval of data

Patient's information entry at every level must be efficient and monitored by health research team to maintain data of international quality. A system needs to be developed for data analysis, daily performance reporting for patient healthcare and dissemination of the knowledge gained in maintaining quality Medical Data Management Systems (MDMS). They are vital for system upgradation through quality research.

Multidisciplinary research

The delineated data generated through health system must be in public domain and researchers to work on data should be encouraged and supported along with a better future. This is expected to improve quality of MDMS, healthcare system and health of the people. For better healthcare system, research is of paramount importance. Hence, at the institutional level research departments with due recognition are necessary. Creation of health research department is expected to ensure vertical and parallel development of all the disciplines in health and disease. At the institutional level, surveillance team with good budgetary support is necessary, as starting the project will cost with many teething problems. Any laxity in implementation of the NDHM will harm the entire project.

Steps needed to implement MDMS

Orientation and essentiality of medical and allied fraternity in using NDHM for their research and self-improvement are the basic need to make NDHM fruitful. Creation of infrastructure and generation of manpower to use NDHM must be implemented together as it will improve the safety, quality and efficiency of healthcare providers in the medical institutions and community. Similar to NDHM, MDMS has been used in all premier healthcare institutions in India for long. Furthermore, the institutions using MDMS are top medical institutions engaged in research. Hence, the responsibility of maintaining and updating NDHM can be assigned to national, government and premier private teaching institutions by providing infrastructure and manpower.

Infrastructure and manpower

A high-powered Central NDHM Committee needs to be formed to support the process of developing infrastructure for NDHM so that the time and finance management are smooth with the responsibility of staff recruitment, staff training, need assessment, procurement and installation as per time line. A technical central department comprising of IT professionals, data analysts, data management professionals and data users needs to be established, along with coordinating administrative staff, to monitor the progress and need assessment. A coordination committee of data users comprising of all the data generating specialities, and data management and IT professionals needs to be formed so that the software for each data user is developed and implemented as per the thrust area.

Birth, Death and Morbidity Registration in NDHM

Population Registers to record births, death and migration at local (village/sub-town), sub-district, district, state and national levels were initiated under the provision of the Citizenship Act, 1955 and the Citizenship (Registration of Citizens and Issue of National Identity Cards) Rules, 2003 (Census of India, 2011). Due to gross under-registration and recording deficiencies in birth and death registration, Sample Registration System (SRS) came into existence on a pilot basis in a few selected states in 1964-65. Though SRS was initiated on a pilot basis for a short period, but it became a large-scale registration system for providing reliable annual estimates of birth and death measures at national and state levels (SRS, 2020). In this scenario, NDHM is a boon for maintaining birth, death and morbidity registers, and is expected to provide vital statistics of international standard.

Right to health and Constitution of India

The Constitution of India incorporates provisions of guaranteeing everyone right to the highest attainable standard of physical and mental health. Article 21 of the Constitution guarantees protection of life and personal liberty to every citizen. The Supreme Court of India has stated that the right to live with dignity in Article 21 is derived from the directive principles of state policy and, therefore, includes protection of health (Morcha, 1976). Hence, it is a constitutional obligation of the state to provide appropriate health facilities (Mathiharan, 2003).

Discussion and Conclusion

Countries and health institutions using MDMS with portability are at the top ladder of development in the world. Hence, EHRs with portability are the first necessary condition to uplift health and economic development of a country. The USA and France adopted EHRs first and reached the zenith of health levels to empower their citizens for health and productivity. EHRs will help health personnel in diagnosis and treatment, citizens will get better health and the judiciary will benefit from EHRs, as it will get quick and uncensored health records. To contain viral and infectious diseases, a system named Notifiable Disease Report exists. Most health institutions report notifiable diseases to state and central governments. These reports are consolidated by WHO for necessary action at appropriate level to contain the disease.

The portability of records will strengthen reporting system of births, deaths and diseases. MDMS will maintain health history of citizens of the country, which will provide health services with fullest knowledge of healthcare providers and health beneficiaries. Therefore, suitable measures to evaluate MDMS, health of citizens and their impact are a necessity for the functional MDMS.

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