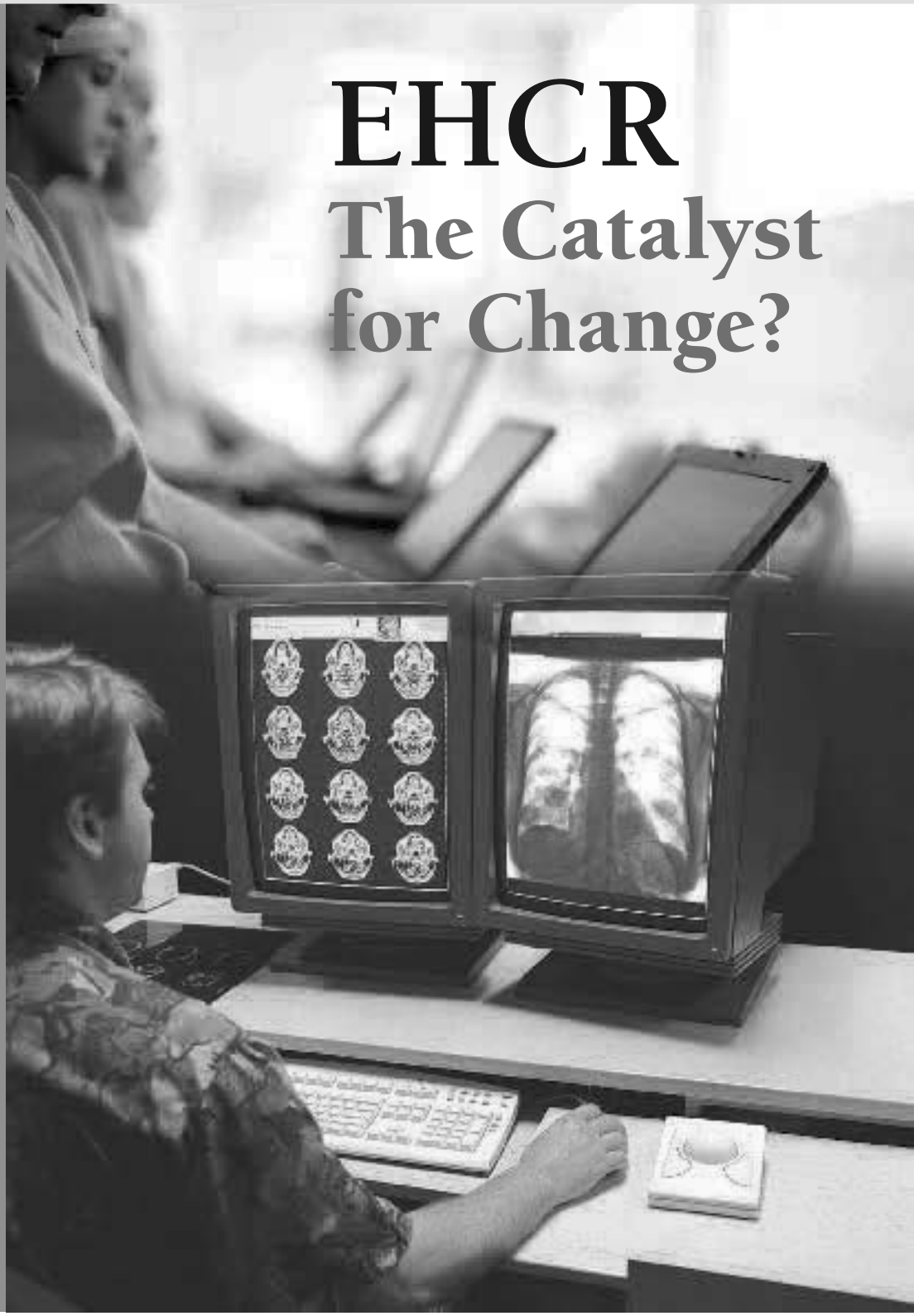
VOLUME 2 | ISSUE 4 | APRIL 2007

eHEALTH

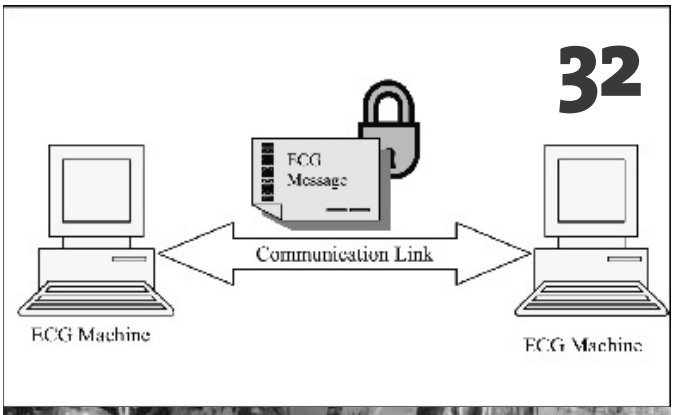
A MONTHLY MAGAZINE ON ICT AND HEALTH

Rs. 75

EHCR
The Catalyst for Change?



www.ehealthonline.org



Advocacy for a Common EHCR Architecture

Role of electronic healthcare record for effective healthcare services

Developing a common low cost electronic healthcare records (EHCR) system in India involves great challenge. There is a need to evolve a centralized system of storing, accessing and processing the medical records in electronic form, with all applicable standards and security support. The existing, so called EMRs are proprietary, with no interoperability, and are very costly. They mainly cater to the need of big hospitals in India.

Santulan Chaubey

The healthcare industry in India is undergoing significant growth. Quality healthcare is available in the country, at a much more affordable rate than in the west, which has resulted in a boom of sorts in medical tourism. However, at the same time there is a need to strengthen the public health services so as to make quality healthcare reach the socially and economically challenged population of the country.

The primary health care (PHC) centers have to be empowered to reduce the load on secondary and referral healthcare centers. Presently there is a heavy load of patients on secondary and specialty healthcare centers due to non-efficient system of primary healthcare (PHC) centers. The power of information and communication technology can change the face of healthcare scenario in India, if the government takes up it as a mission mode project.

National Health Policy-2002 (NHP) envisages an IEC policy, which maximizes the dissemination of information to those population groups, which cannot be effectively approached through only the mass media. However, the National Health Policy has not emphasized on taking technological advantage in the health sector, especially in public healthcare. The time is ripe to set the ball rolling and an effective answer to address the healthcare needs of India through the aid of ICT, lies in electronic healthcare record.

Keeping medical record electronically at one place and accessing it electronically by healthcare centers may change the present way of health services in India. The role of electronic healthcare record (EHCR) is of great significance in terms of overall effectiveness of healthcare services in this country. If entire medical history of the patient is available at one place (even if consultation has been given in different hospitals), there will be less time required to provide medical assistance to the patient. Besides here are number of situations where patient is not able to collect the record and all tests, history, etc. has to be done again and again over a period of time. The EHCR will be saving hard earned money of patients if the lab tests are readily available for examination.

In this regard, Indian health sector should take a leaf from the Indian stock and share market, where entire scripts are kept electronically in DEMAT form by the users in the stock exchange and trading worth of millions of rupees is done online, on a daily basis. A similar system has to be developed for health records that may be unique in the Indian health sector.

However to develop a common low cost electronic healthcare records (EHCR) system in India involves great challenge. There is a need to evolve a centralized system of storing, accessing and processing the medical records in electronic form, with all applicable standards and security support. The existing, so called EMRs are proprietary, with no interoperability, and are very costly. They mainly cater to the need of big hospitals in India.

The EHCR should be used right from the primary healthcare centers to private nursing homes. Like PAN card, a healthcare card should be issued to all, containing unique MRI (medical record Id) on it. To encourage the use of card, the card holders may be given additional benefits like priority in medical checkup, cost benefit in pathological testing, etc. Development of a common, low cost EHCR has potential opportunities of private-public partnership (PPP) in its implementation. Health insurance companies, pharmaceutical companies, medical equipment manufacturers, etc. can be involved in its implementation process, provided their involvement is ensured right from the planning stage of EHCR, in the Indian environment.

Here we attempt to explore the possibilities of developing a low cost, common EHCR for India, consisting of all applicable international standards in Indian conditions. First of all let us examine what EHCR actually is and also the progression of EHCR from automated medical records.

THE PROGRESSION DOES COMPRISE OF THE FOLLOWING LEVELS:

1.The automated medical record is a paper-based record with some computer generated documents.

2.The computerized medical record (CMR) makes the document of level 1 electronically available.

3.The electronic medical record (EMR) restructures and optimizes the documents of the previous levels, ensuring interoperability of all documentation system.

4.The electronic patient record (EPR) is a patient-centric record with information from multiple institutions.

5.The electronic health record (EHR) adds general health-related information to the EPR that is not necessarily related to the diseases.

THE ELECTRONIC HEALTH RECORD SHALL BROADLY FACILITATE:

- Access of patient data by clinical staff at any given location
- Building automated checks for drug and allergy interactions
- Availability of clinical notes and prescriptions
- Lab reports along with timeline analysis
- Accurate and complete claims processing by insurance companies (this has potential for a business model through subsidising the implementation and operational cost involved in EHCR.)
- Analysis of various diseases and development of a warning system, devised from trends of occurrence of diseases.
- Planning and development of health facilities, depending on actual requirements
- Research and development
- Government would have database of citizens that could be used for other planning purpose.
- Insurance companies may use this data for the purpose of authenticating fitness of customer.
- Pharmaceutical companies may plan manufacturing of medicines as per the trends readily available to them.

CHALLENGES AHEAD

However, there are manifold challenges in developing a low cost (here we refer to the cost to the user) EHCR on common architecture. They include interoperability with various hospital information and management systems (HIMS) in market, adding of legacy data (physical records like x-rays, MRI reports, prescriptions, etc.), adhering to various international standards of managing information like International Coding of Diseases (ICD – 10), Health Level (HL–7), etc.

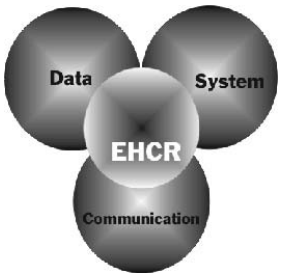
Then there is the thorny area involving privacy of health records, and the tangle of legal issues. Preservation of electronic records and maintaining security of patient record and the right to access can also pose challenges to the implementation of EHCR. Besides considering the present framework of health service, there will be lots of business process re-engineering required, which can prove to be another impediment to the success of EHCR. Lastly it leaves room for duplicity in health record. A given patient with a health card may go to another place within the country and again get a new health card prepared.

But the most daunting challenge is to create a common EHCR system, suiting to Indian conditions and acceptable to all kinds of medical service providers. There are already international standards available for EHCR, but hardly followed even in developed countries. Interoperability in various EHCRs, available in different hospital information systems, is a big concern towards having a common EHCR.

> *"Development of a common, low cost EHCR has potential opportunities of private-public partnership (PPP) in its implementation. Health insurance companies, pharmaceutical companies, medical equipment manufacturers, etc. can be involved in its implementation process, provided their involvement is ensured right from the planning stage of EHCR, in the Indian environment.*

THE OPPORTUNITIES INVOLVED

India is a fast growing country in the field of information technology. The National Informatics Center (NIC) has already setup its network up to the block level in India. The economy of India is booming with lots of business opportunities for medical as well as technical professionals. As mentioned earlier, healthcare industry, notwithstanding the lacunae, is also growing at a healthy pace. In the light of this present scenario, there are enough opportunities for insurance, pharmaceutical and medical equipment manufacturing companies to come forward with a business model to create a common EHCR system, which could be afforded by a healthcare center having minimal infrastructure. This EHCR system should become the integrated part of all HIMS and other applications. In IT terms, it should be like Transmission Control Protocol/Internet Protocol (TCP/IP) suite, without which no operating system can exist in the market.



This is the right time to take the benefit of this evolution and connect health services of major hospitals / clinics / nursing centers to the block levels, all over the country. Though telemedicine is the easiest thing to start, but this does not serve the purpose in the absence of complete medical record of the patient. However, to implement EHCR successfully, we must understand the components involved in the EHCR system. There are three components involved in the EHCR system:

1.Data Storage: We already have data centers available with NIC at state and district levels, with good security and access system.

2.Communication System: Fortunately, there is a very good communication network available all over India, up to block level, mainly through Bharat Sanchar Nigam Limited (BSNL) / Mahanagar Telephone Nigam Limited (MTNL) and many private players. Other private players are following this trend.

3.The Application System: Entire EHCR system has to evolve around the common architecture, to be developed and to be implemented in all HIMS regardless of operating system, environmental issues, health care standards, etc.

AN APPROACH TO THE DEVELOPMENT OF EHCR

A top to bottom approach will be required to develop a common electronic healthcare record system in India. The group of experts from medical administration, clinicians and information technology will have to contribute on a common platform to develop a low cost interoperable EHCR system. This EHCR should be integrated with all HIMS, as required component. Involvement of various medical equipment companies will also be required to ensure the compliance of international standards of data exchange.

> *"Preservation of electronic records and maintaining security of patient record and the right to access can also pose challenges to the implementation of EHCR. Besides considering the present framework of health service, there will be lots of business process re-engineering required, which can prove to be another impediment to the success of EHCR. Lastly it leaves room for duplicity in health record ...*

A wide variety of data standards, medical terminologies and coding classification systems will play a major role in making electronic medical records systems interoperable. Same time, there is a need to evolve EHCR in local conditions and even in local language.

Once the common standards are developed and frozen by the set of experts and supported by the government, there is high possibility of various business models including public-private-partnership (PPP). The IT companies involved in healthcare solutions will have to adopt common architecture in the HIMS. During the first time entry of a patient at PHC / hospital, etc. a plastic card should be issued to him / her containing the EMR Id, name, sex, age, blood group, allergies, etc.

UPDATION AND STORAGE OF MEDICAL DATA

However, if EMRs are not updated then its usefulness will be limited. Updating of the EHCR will also require lots of initiatives from both government as well as the private sector. In its first phase, we should be updating everything except images as it may create problems in accessing the data for both retrieving as well as entering. In its first phase, data updating should be limited to non-image records. Once the feasibility of storing images becomes possible, we may think of storing images too.

Daily updating should include births and deaths, medical testing reports, admission, discharge, etc. The escalation procedures should be inbuilt in the system to ensure the compliance. The exception reports should be automatically emailed to the concerned CMOs of districts on a daily or weekly basis, to ensure updating of data.

Under data protection legislation, generally the onus of maintaining patient records (irrespective of the form they are kept in) is always with the creator and the custodian of the record; usually a healthcare practice or facility. In all hospitals, there is a separate medical record department (MRD) for this purpose. To store the EHCR, there is need to change the way we manage records today.

The basic responsibility may remain with the creator of records, but the physical storage place may be shifted to NAS (Network Accessed Storage)/ SAN (Storage Area Network) in place of MRD. A storage area network (SAN) is a network designed to attach computer storage devices such as disk array controllers and tape libraries to servers. NAS is a disk array storage system that is attached directly to a network rather than to the network server (ie. host attached); it functions as a server in a client/server relationship, has a processor, an operating system or micro-kernel, and processes file I/O protocols such as SMB and NFS.

The NIC may be entrusted with this responsibility of co-locating the Storage Area Network (SAN) / Network Accessed Storage (NAS) at state / district level in India. The computerized system installed at various healthcare providers may access the required patient information directly from NIC, provided they have enough rights.

BUSINESS PROCESS RE-ENGINEERING AND IMPLEMENTATION

There should be a mandate from government to use common EHCR based information system only and it should be one of the prerequisites for registering nursing homes, laboratories, hospitals, etc. In the qualifying parameters to setup a healthcare facility, daily updating (if not online) of data should be made compulsory. Moreover, thanks to the reduction in cost of material, the cost of this health card should not exceed INR 2-5, so as to make it affordable to all and sundry. To encourage the use of this card, the card holders may also be given additional benefits like priority in medical checkup, cost benefit in pathological testing, etc.

The EHCR implementation must follow the 80:20 rule; that is, 80 percent of the work of implementation must be spent on the issue of change management, while only 20 percent should be spent on technical issues related to technology itself. To test its feasibility, a pilot can be run involving state capital, one district and three four blocks of that district. The Government is to give necessary instructions and infrastruc-

ture for compulsory healthcare card on the pattern of voter Id Cards.

This innovative system has potential of becoming a people's application, which will get implemented on the public demand once its usefulness is understood by the public as it happened in railway / airline reservation. Having this facility in nursing homes will become a quality standard in the nursing homes / testing centers.

PROPOSED GOVERNMENT INITIATIVES

Furthermore, the government should take the following initiatives with considerable urgency to give a momentum to the EHCR movement. Firstly it should develop low cost application for managing health services, based on an acceptable common architecture for primary healthcare centers. This software should take the advantage of broadband boom in India, to connect to the major hospitals as and when required. The software should not be proprietary in development and in its use. The primary EMR of a patient should be generated by this application only. This EMR should be shared by any referral hospital.

The government should also develop data centers at state and national level for healthcare services, under National eGovernance Project (NeGP), to provide sharing of EMR across the country. However, the access to these data centers should not be limited only to government hospitals and dispensaries but should also be open to private hospitals and clinics. There is a possibility of having a business model for sharing the information. ■

REFERENCES:

- Anjan Prakash: Medical Auditing, JAYPEE
- GD Mogli, Medical Records – Organization and Management, JAYPEE

Online References:

- http://www.ibef.org/industry/healthcare.aspx
- http://www.hl7.org/documentcenter/public/pressreleases/CMeadV3Article_HIMSS_Winter_71_78.pdf
- http://www.hl7.org/
- http://www.omg.org/news/releases/pr2005/03-08-05.htm
- http://www.india.gov.in/outerwin.htm
- http://www.iupac.org/symposia/conferences/ga05/posters/40_lancashire.pdf#search=%22International%20Standards%20on %20EMR%22
- http://www.healthdatamanagement.com/html/current/CurrentIssueStory.cfm
- Medical Record Institute website: http://www.medrecinst.com/

Santulan Chaubey
santulan@hotmail.com
Manager, Information Technology, Institute of Liver and Biliary Sciences, New Delhi

INTEROPERABILITY IS WELCOME BUT PRIVACY SACROSANCT

Competitiveness and Innovation Framework Programme (CIP), as part of the Framework 7, is going to provide a big fillip to e-Health, at the interoperability front also.

Paul Timmers, the head of the European Commission's eGovernment says work is underway on "interoperable platforms that can work… across borders".Dr Gerard Comyn, head of the ICT for Health unit, confirms that the idea has progressed beyond the proposal stage and a large-scale pilot involving six member states will be operational in the next 3 years, and real scale operations would be in place by 2012.

European Commission's ICT for Health unit calls for interoperability between European nations' healthcare systems. Logic is that health, social care and other providers should no longer work in isolation, but need to collaborate as a team, if necessary beyond their national and linguistic borders.

The member states will supply at least 60 percent of the funding, with the European Commission providing the rest. Observers say that the scheme can do wonders in situations. For example, suppose a British citizen fell ill while being in Switzerland, the doctors there can easily know what medication the patient should be taking or what were the conditions that patient had been experiencing before.

US SCENARIO

But the issue of invoking privacy regimes in the matter of health records is blowing hot and cold. In the U.S, a policy debate is raging over how much control patients should have over the transmission and sharing of their electronic healthcare records.

Canada, the Netherlands and the United Kingdom are ahead of the U.S. in setting privacy policies in favour of patients exercising more control, and also about implementing systems that empower patients to restrict the flow of their information-both in whole and part.

According to Joy Pritts, a privacy lawyer and Associate Professor at the Georgetown University Health Policy Institute, "Canada is using masking technology right now." In Canada, Canada Health Infoway, the Federal IT Support Programme and the Pan-Canadian Privacy Framework works on privacy protection programmes in some of its provinces.There are hundreds of (IT) projects happening in Canada that are getting funding from Canada Health Infoway. To qualify, they have to comply with the federal privacy and security architecture and prove their systems can comply with and support the local privacy laws.

In Canada, British Columbia's PharmaNet project allows patients to mask their entire prescription record and only selected providers can see that record by sharing a password with them. In the U.K., the National Health Service is creating a central database for storing individual demographic data and health summaries called Summary Care Record, which will contain links to more detailed care records kept by providers.■