Decision Support System for Patient Care

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Abstract

With rapid development of medical information technology, Electronic Health Record(EHR) provide basis for various health services.This paper presents Decision Support System(DSS) for patient care with help of EHR. This paper tells how this DSS can be helpful for both doctor and patient.To check the effectiveness of this DSS a small survey was done.From results of the survey it is evident that quality of healthcare delivery can be improved by using this DSS.The investigation revealed that it prevent handwritten prescription risk,allow quick access during emergencies & can also be helpful for patient in remote area where doctor is not available.By this means,we provide our consumers an overall scene of the patient's personal history,personal health status & future care plans. This paper tells how DSS for patient care is helful for making better decisions by doctor i.e. by spending less time in management and more with patients & by patient i.e. with application of "Six in one module" function in system.

Keyword- Decision Support System ,Electronic Health Record

1. Introduction

The major problems confronting clinics and many hospitals are increasing population, management of large amount of medical records, medical errors & uneasy access of healthcare information.This directly effect patient care & health.To sort such problems can be time consuming if done manually that's why demand for quality and safe health care decision support system softwares are increasing.

With a rapid development of medical informationization,more

Fig. 1. Health record storage systems

and more eyes are attracted to the EHR [1].An Electronic

Health Record(EHR) is basically a patient record that resides in a computer system specifically designed to support healthcare providers by providing accessibility to patient data, medical alerts,reminders,clinical decision support systems, links to medical knowledge,for observations and other aids.Use of Medical Information Technology in Healthcare ,especially Electronic health record, can potentially improve and maintain healthcare.A Decision Support System(DSS) is a computer program application that anatomize data and presents it so that users can make decision more easily.It is an informational application.A Decision Support may present information graphically and may include an expert system or artificial intelligence. Healthcare extends beyond one person, in one department, in one building,in one sector.It is an active process that requires communication, collaboration, and

decision making across care providers and care setting.An EHR as DSS for patient care offer solutions that break down barriers to help you to solve business problems,improve patient safety, strengthen the revenue cycle,help in decision making and enable technology to improve patient care.Also it aimed at satisfying the requirement of Community Health Centre(CHC) and solving the problem of lacking mobility.This paper therefore studies the working process of end users and tries to uncover the real nature of medical work by introducing relevance of EHR.
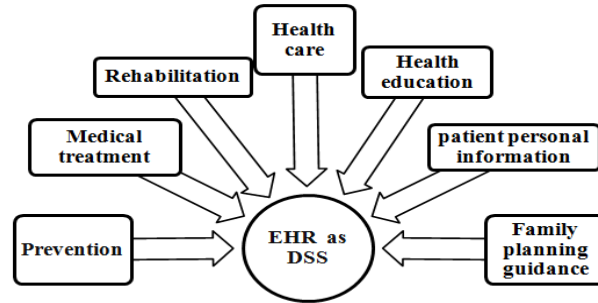
2. Decision Support System For Patient Care

Fig. 2. Healthcare scenario

The Six in One is the emphasis of CHS, including Pre- vention,Medical treatment, Rehabilitation,Health care,Health education and Family Planning guidance.The six functions are not divided,but a comprehensive service combining with all functions in the module of Six in One.We had embedded the Six in One function in the EHR system as DSS.This EHR system could provide the corresponding to the differ- ent individual resident health,so as to be more individua- tion.Like for sudden illness the EHR as DSS, because of the portability and mobility,could collect and record health information.Time could be saved by this.It is also helpful for chronic and non-communicable disease in remote areas by providing diagnosis, treatment and medical alert.Health Education(including family planning guidance) is considered as the main contents of CHS.Then the health protection knowledge could be pervaded. The EHR is defined and divided into 4 categories i.e.Institutional EHR,Shared EHR,Personal EHR and Population EHR.The successful deployment of ap- propriate EHR requires both functional and semantic interop- erability and security and privacy protection with applications of relevant standards HL7 CDA[3],Clinical Decision Sup- port Systems,Evidence- Based Medicine, Individual- Based Medicine.The application of international Health Informatics standards is essential for a successful EHR development. The content of an EHR consist of administrative and clin- ical data.The content should be comprehensive and expres- sive,addressing all aspects of healthcare process for all re- lated disciplines and authorities.The administrative content in- cludes patients name,record number, food preferences,smoking and alcohol consumption [2].The clinical content includes symptoms,drugs prescribed,observations and lab reports. The availability of information is the expected value of an EHR as DSS that is agreed upon by all end users.Our project EHR as DSS is completely patient-centric.It keeps medical information safe and secure.It helps to make better decisions.It allows you to spend less time in management and more time with patients.It can cause reduction in chaos in hospitals or clinics during peak hours.It let you get a specialist and colleagues opinion.It prevent handwritten prescription risk.It allow quick access and response during emergencies.It can alert you to potential adverse drug reactions.It will provide you information confirmed from specialist even if you are present in remote area where there is no doctor. For example when an individual goes to see a doctor for a specific condition or care, a medical record is constructed containing information such as personal and social history,a physical notes made by doctor, consultations,lab or image results from other health care providers and so forth.In our application information typed into such an electronic medical record; paperless records that contain health care and medical information just as paper medical records,but take up such less space and are available in electronic formats,which makes them accessible via palm pilots,desktop application,web application etc. that connect doctors office,hospitals and clinics. Unanimously, EHR as DSS is a platform and technology independent standard.It reduces paper work.It facilitate better patient care. It reduces labour and time.It gives you flexibility as it can be implemented using a variety of software technologies to suit your information needs.

3. Methodology

The Electronic Health Record(EHR) as DSS for patient care is the keystone of a medical information system.In India,the IT adoption in Healthcare is estimated to be only twenty percent and EHR adoption in government healthcare facilities is very slow but the private sector is aggressive in their plans.To gain insight into the functioning of healthcare centers with respect to use of information technology and their effectiveness in health care delivery, a survey was done.Thirty(possible) end users of DSS for patient care were interviewed about their process and the expected value of EHR.The interviews took in 5 different hospitals.Beside medical specialists other medical staff & patients was also interviewed.Questions was based on patient load,medical record formats,hospital infrastructure,daily routines and staffing information.Responses were tabulated and were used to depict results and draw inferences.Factors which end users find relevant for an EHR as DSS are Availability of information,Less administrative work, Analyses,Uniformity of working processes, Reliability,Quality of care,Collaboration with colleagues,Time,& Just being a good doctor.The availability of information is the expected value of an EHR as DSS for patient care that is agreed upon by all end users.

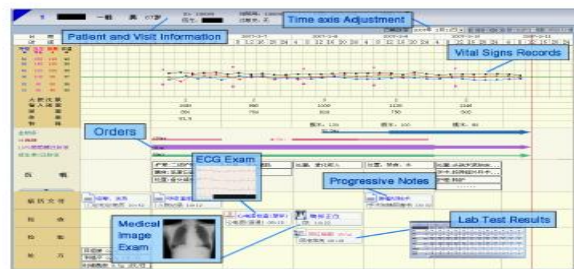Also during survey large amount of medical information

Fig. 3.   Patient's Health-Record Management

collected.EHR as DSS for patient care can be helpful for doctor i.e. by recording patient health status as well as for patient in remote areas or not in condition to visit to any clinic i.e. tells various possibilities of communicable or non-communicable diseases [6] & also various internal or external injuries from symptoms which user will choose from given options.From patient point of view EHR as DSS for patient care is helful for all five categories:Newborn baby; child;teen;adult;senior[5].It can contain lab tests results which can tell the current status of patient.For example diabetic patient test his/her blood sugar from diabetic tester and then can check his/her level from lab results.It includes best diet charts for different categories.Due to portability and security java language can be chosen to make this system more effective and successful.From Doctor point of view it can keep all medical records safe and secure and allow quick access during emergencies[4].

4. Feasibility Result

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture,opportunities and threats as presented by the environment,the resources required to carry through, and ultimately the prospects for success.In its simplest terms, the two criteria to judge feasibility are cost required and value to be attained. Today,healthcare organizations still heavily depend on paper-based medical that are the least secure form of health records,whether in hands of a patient or a medical provider. Paper is easily misplaced,lost,intercepted and read by unauthorized parties[7].In the digital era,Electronic Health Records are replacing paper based records.Use of Information Technology in healthcare, especially electronic health records,can potentially improve healthcare.Our project EHR as DSS for patient care is completely patient-centric.It keeps medical information safe and secure.It helps to make better decisions.It allows you to spend less time in management and more time with patients.It can cause reduction in chaos in hospitals or clinics during peak hours.It let you get a specialist and colleagues opinion.It prevent handwritten prescription risk.It allow quick access and response during emergencies.It can alert you to potential adverse drug reactions. It will provide you information confirmed from specialist even if you are present in remote area where there is no doctor.Also with help of EHR as DSS healthcare awareness of patient increases,demographic information will be available for planning better health care delivery and reduces risk of loosing research work on certain observations[8]. Unanimously,EHR as DSS is a

platform and technology independent standard.It reduces paper work & uses cost effective approaches. It facilitate better patient care.It reduces labour and time.It gives you flexibility as it can be implemented using a variety of software technologies to suit your information needs.The availability of information is the expected value of an EHR as DSS that is agreed upon by all end users i.e. early prevention is the foundation of digital health care system for community health service.

5. Conclusions & Discussions

In this paper we discuss how decision support system is useful for both doctor and patient.First we represent this DSS as patient-centric system.Then we further divided into two modules i.e. first from patient point of view & second from doctor point of view.First one based on decisions made by patients by clicking on symptoms of their disease.Then from graphical decision support system, various preventive measures are provided & even in case of emergencies contact number of specialist is also provided.Basically first module is based on content management.Second one represent all kinds of EHR data as clinical acts under unified structure.This provide some fundamental visualisation forms for each kind of EHR data.This depicts overall situation of patient.It just not only help the clinicians in their daily work but also useful during emergencies. Clincians & Patients told us that it was very useful and helpul for them to view overall health status of any particular patient.However they still have many more requirements[1].They need an integrated viewer which provide more information and more flexible visualization.Also the need artificial intelligence approach instead of graphical approach in content management.We will make more detailed analysis of all clinical acts and on neural and finger-print systems and design more visualization forms to satisy these new requirements in the future[9].

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