

The electronic medical record in 2016: Advantages and disadvantages

Joseph S. Alpert*

Department of Medicine, University of Arizona College of Medicine, Tucson, Arizona 85724, USA

ABSTRACT

The electronic medical record (EMR) is now nearly ubiquitous in the USA. This article will review the EMR system with respect to goals, utilization, advantages compared with hand written records, as well as problems and/or disadvantages of the EMR system.

Keywords: Electronic medical record, in-patient, out-patient, patient care

INTRODUCTION

What is an electronic medical record (EMR)?

Definition - An EMR is the legal patient record that is created in digital format in hospitals and ambulatory environments. EMRs may include a variety of personal and clinical information.

The EMR is almost universally used in health-care systems throughout the United States as a result of a federal government decision to financially reward systems using an EMR and to punish systems financially who are not using an EMR. A number of different providers offer large computerized systems to cover both in-patient and out-patient services. For the last 2 years, my hospital has been using one of the most popular and most expensive systems, the Epic EMR. All of the EMR systems in use now in the USA are highly sophisticated and will undoubtedly become more so in the future. The detailed objectives of

the EMR system are as follows: Access detailed patient information, document patient progress, assist in chronic disease management, facilitate disease coding for billing and disease demographics, improve communication between health-care providers with information that is easily accessible and legible, provide health-care staff with decision support tools, create educational patient handouts, and help track health maintenance and preventive medical interventions. Moreover, of course, to do all of this in an environment that is secure and private.

HOW DO ELECTRONIC MEDICAL RECORD SYSTEMS WORK?

How does this computerized system work? The system sends clinical information to the health-care provider's EMR inbox with each patient visit carefully documented. It can take up to 6 months to train personnel how to use the system efficiently. However, once the health-care providers are fully trained, the system allows for a complete examination of the patient's clinical information in a relatively short time. Additional visits are quickly entered into the EMR database once providers become

*Address for correspondence:

Prof. Joseph S. Alpert, Department of Medicine, University of Arizona College of Medicine, 1501 North Campbell Avenue, Tucson, Arizona 85724, USA.
E-mail: jalpert@email.arizona.edu

Access this article online

Quick Response Code



Website:

www.digitmedicine.com

DOI:

10.4103/2226-8561.189504

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Alpert JS. The electronic medical record in 2016: Advantages and disadvantages. Digit Med 2016;2:48-51.

experienced. Patients have access to much of the information in their health record, and this can be helpful in ensuring adherence to a therapeutic program. However, patients can be confused by medical terminology, and explanations may require additional clinician time. Appointments and test requests are also clearly listed in the EMR, which benefits both clinicians and patients. The system can be programmed to provide reminders for disease management, annual screenings, or required immunizations. Finally, the system can provide accurate and rapid billing and collection information.

There are a number of organizational concerns when an EMR is utilized. For example, computer server crashes, security breaches, and off-site data storage can complicate the use of these systems. Patients complain that the system interferes with the more “hands on” physician–patient relationship by making visits more impersonal. In addition, there is an initial loss of productivity when the EMR system is put into place because of training and implementation.

POTENTIAL BENEFITS OF THE ELECTRONIC MEDICAL RECORD

What are the potential benefits that can be realized by using the EMR? First, the use of an EMR helps to reduce medical errors by utilizing computerized prescription entry, predicting drug interactions and displaying a warning for the health-care provider, assisting clinicians in reconciling patient medications, and most important, maintaining a detailed and legible medical record. Theoretically, EMR-guided visits should be shorter and better organized although increased time is required to write the electronic clinical note than with handwritten notes. Another major plus for the EMR is that patients can be seen sequentially by different providers with up-to-date information immediately available to all providers. This was often difficult when paper charts were being utilized. In addition, the EMR gives clinicians immediate access to patient medical information, as well as the ability to enter and store orders for prescriptions, tests, and other services in a computer-based system with orders and clinical notes easily stored. This saves a lot of storage space that was needed when paper records were the norm.

Other advantages include the fact that the system allows the patient to access their own medical information easily and from home. Moreover, EMRs include scheduling systems that can greatly improve hospital and clinic efficiency and provide more timely service for patients. Furthermore, the EMR system gives the health-care

provider instant access to other clinicians’ evaluations, as well as all diagnostic tests. From an academic point of view, the EMR is an excellent tool for “big data” research through the huge amount of clinical information that is stored in the database. Overall, the EMR is efficient, secure, and readily accessible to staff and to patients.

CHALLENGES IN USING AN ELECTRONIC MEDICAL RECORD

From the physician’s point of view, the EMR can be useful but also presents some challenges. Benefits include legible orders, the volume of transcription material is reduced, and orders are rapidly routed. One large challenge involves getting a large medical staff trained in the use of the EMR. This is particularly a problem with older physicians who may not be very “computer savvy.” The high cost of these systems is another challenge for hospitals and practices. It is often difficult to measure any financial benefit given the high cost of these systems. One study of cost–benefit of EMRs was done at the Samsung Hospital in Korea. The investigators there found that the EMR was cost–beneficial. An 8-year analysis of cost–benefit at this institution found that the net present value of the system was positive at \$3617 (US dollars) with a benefit to cost ratio of 1.23.^[1] However, it required 6.18 years of use to accrue this cost–benefit which was the result of cost reductions and additional revenue. The benefit was attributed to cost reductions and additional revenue. Finally, we are still dealing with early generations of EMRs which almost certainly will evolve in future versions.

THE ELECTRONIC MEDICAL RECORD AND MEDICAL ERROR

It is widely believed that EMRs will reduce physician error and increase patient safety by eliminating errors resulting from illegible handwriting. Medical documentation in the EHR is clear and legible and thus reduces confusion. There are fewer forms to fill out during a visit with fewer repetitive questions, for example, regarding past medical history. The EMRs alert system ensures that proper dosage and drug utilization are administered to patients. Park *et al.* noted that the EMR had the potential to improve patient adherence to prescribed drug therapy.^[2]

POTENTIAL PROBLEMS WITH THE ELECTRONIC MEDICAL RECORD

Similar to all new technologies, there are some potential problems with the EMR. Hackers can easily gain access to

the system. Moreover, when a health-care system employs EMRs, this can lead to technical difficulties when there are problems with the computer system. Moreover, EMRs are expensive initially and during maintenance. Users need to be trained to use the EMR, and this requires considerable time and changes in system and work practices. EMR clinical notes require more time to create compared with handwritten notes. In addition, unfortunately, the different EMR systems do not communicate with each other so that information in one hospital may not transfer easily to another hospital using a different EMR system. EMR companies are working vigorously on this latter problem since the federal government in the US has mandated that the different EMR systems must be able to communicate with each other in the near future. Another problem is that the EMR encourages the use of the “copy and paste” syndrome as opposed to writing original observations. Other complaints that have been mentioned by EMR users include difficult to use programs, technical failures, the cost associated with training staff, lost passwords slowing access, and the fact that there are so many templates and not enough narrative notes. Finally, EMRs in their current form are not useful to psychiatrists and psychologists in that they fail to provide an adequate overview of the treatment process.^[3]

THE ELECTRONIC MEDICAL RECORD AND RESEARCH

The EMR database can be a potentially huge asset for so-called “big data” research since detailed clinical information on literally thousands of patients is stored here enabling clinical scientists to investigate associations, prognosis, therapeutic outcomes, and many, many other clinical questions.^[4] Some authorities have had ethical concerns about the use of EMRs such as the integrity, security, and privacy of the systems; equality of access; and the authenticity of the data stored therein.

PATIENTS AND ELECTRONIC MEDICAL RECORDS

A question that is frequently asked by the health-care systems about to employ an EMR is “How do patients react to this new form of medical record keeping?” Pyper *et al.* in the United Kingdom questioned 606 patients in the UK who responded to a questionnaire about the use of the EMR in their healthcare. The responses to the questions were as follows: “I want to have access to my health record:” 83% said yes. “I think it is a good idea to make health records electronic:” 79% said yes. However, 50% of patients were concerned about the

security of their health information. Nevertheless, the overall response was quite positive.^[5] In general, there are a number of aspects of EMRs that make them a positive intervention for patients. The EMR gives the patient a larger role in their care through increased patient knowledge and self-management. There is the potential for greater health-care provider–patient interaction, and this can potentially increase patient safety because of the improved communication between the physician, the patient, and other members of the health-care team. However, there are some disadvantages to patients interacting with EMRs including potential confusion when patients do not understand medical terms or reports. Moreover, the EMR has the ability to make the patient–doctor relationship more impersonal. In addition, as noted above, patients are often concerned about the confidentiality of their personal health information.^[6]

PERSONAL OBSERVATIONS ON THE ELECTRONIC MEDICAL RECORD

I have now personally worked with the EPIC EMR for nearly 2 years. In general, I like the EMR system. It enables me to access laboratory and imaging reports instantaneously when I have the patient in front of me. I can also easily access clinical notes made by other physicians involved in the care of my patient. On the in-patient service, my team of residents and fellows and I frequently call up images of X-rays, computed tomography scans, echocardiograms, magnetic resonance imaging, and laboratory data on individual patients when we discuss evaluation and management. Instant access to this information is invaluable. However, it does take more time to complete the out-patient and in-patient notes because of the extensive template required for each patient entry. In addition, the clinical notes end up being very long because the computer adds in all the history, laboratory values, medicines, social history, family history, etc., in every note. The EPIC out-patient note also requires the physician to enter the diagnosis for the patient three times in the same clinical note.

FUTURE DIRECTIONS

There is no question that the EMR will continue to evolve and bring even more information to the clinician caring for a specific patient. Undoubtedly, in the near future, genetic information will also become a routine part of the patient’s record. This will be extremely useful since it will provide the health-care provider with specific information concerning possible diagnoses, as well as important aspects of drug metabolism and sensitivities. Moreover, as noted above, the potential for “big data” clinical research

Alpert: Electronic medical record in 2016

using collected patient clinical data is huge and exciting because of its potential to improve patient care.

CONCLUSIONS

It is my belief that the EMR is a permanent component of modern clinical medicine. It is a useful clinical tool and will improve patient care. We are still in the early stages of its use and development and so there remain problems to make these systems as good as they can be. The EMR is here to stay!!

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Choi JS, Lee WB, Rhee PL. Cost-benefit analysis of electronic medical record system at a tertiary care hospital. *Healthc Inform Res* 2013;19:205-14.
2. Park LG, Howie-Esquivel J, Dracup K. Electronic measurement of medication adherence. *West J Nurs Res* 2015;37:28-49.
3. Van Gool AR, Hoogervorst E, Wunderink L, Mulder CL. Contribution to quality of care or caught in a digital labyrinth? Experience with electronic records of patients receiving long-term mental health care. *Tijdschr Psychiatr* 2014;56:394-401.
4. Van Staa TP, Klungel O, Smeeth L. Use of electronic healthcare records in large-scale simple randomized trials at the point of care for the documentation of value-based medicine. *J Intern Med* 2014;275:562-9.
5. Pyper C, Amery J, Watson M, Crook C. Access to electronic health records in primary care – A survey of patients' views. *Med Sci Monit* 2004;10:SR17-22.
6. Jacob JA. Patient access to physician notes is gaining momentum. *JAMA* 2016;315:2510-1.

