ABSTRACT
This paper discusses the case study by the Journal of the American Medical Informatics Association titled *Electronic Health Record Implementation on Patient Flow Metrics in a Pediatric Emergency Department.* The study focuses on the patient flow affected by the implementation of an EHR in the emergency department at Cincinnati Children’s Hospital Medical Center. The paper begins by providing a general background about the study and its key factors. It continues by providing some assumptions about what may have affected the results and conclusion of the study. The paper then discusses some possible solutions to implement an EHR in an emergency department taking into consideration its effect on patient flow and how it could possibly be maintained throughout the implementation period. The paper concludes by setting the focus on one solution that might be extremely vital to reducing the impact of EHR implementation on patient flow.

**Keywords:** EHR, LOS, LWBS, patient flow

EMR Implementation and Patient Flow

**Background**

Throughout the past several years, healthcare organizations became aware of the positive impact of electronic medical records (EHR) on the quality of patient care. Evidence also show that other than the improvement in the quality of patient care, hospitals' return on investments (ROI) might be rewarding in the long run (Lorenzi, Kouroubali, Detmer, & Bloomrosen, 2009). However, when it actually comes to implementing an EHR or EMR in a hospital, challenging questions begin to rise to the surface, including what procedures would take place during the implementation? Or, how do we ensure the quality of patient care during implementation? These questions may force a healthcare organization to delay the implementation of an EHR especially due to the lack of research revolving around the ideal procedure to undertake throughout implementing an EHR. The case study titled *Impact of Electronic Health Record Implementation on Patient Flow Metrics in a Pediatric Emergency Department* in the Journal of the American Medical Informatics Association (2011) addresses the aforementioned questions and aids in developing a clear understanding and reaching a possibly unanimous decision that would set an ideal standard for thru-implementation procedures. The study took into account several key factors to quantify the quality of patient care, including timelines, efficiency standards, or length of stay (LOS).

**Issues**

The study set to accomplish this by trying to divert some of the low-acuity patients to an offsite clinic in efforts to decrease the volume of patients during implementation. The goal was to have a small number of patients in the emergency room (ED) so that physicians and nurses can train to use the new system as implantation took place as well as give opportunity to those caring for patients to provide a high quality of care. Staffing was also increased to ensure patients are being covered in a timely fashion, with the extra time focused on implementation. Such interventions were aimed towards maintaining the same patient workflow before implementation, during implementation, and post implementation.

This study was conducted at the Cincinnati Children’s Hospital Medical Center (CCHMC) Emergency Department (ED). The stockholders in this scenario were the hospital, healthcare providers, and the patients. One of the major issues discussed in this study is the slowdown of patient flow due to the implementation of EHR, which was parallel to the work efficiency of providers. The length of stay (LOS) increased significantly during the implementation of EHR. The finding suggested that the implementation of EHR contributed to the delay in providing care to the patients.

**Potential Solutions**

Based on the findings of this study, one must think of other factors that may have affected the study, while avoiding extreme assumptions. One observation was that the study at CCHMC was first conducted around a holiday season. There are several holidays following Thanksgiving in September that may have affected the study. It seemed that patient visits around the holidays were averaging around 1,300 patients each week, and this number was decreased by over 20% on normal days. This may have contributed to the slowness of patient flow in the ED, suggesting that patient flow was not necessarily affected by the implementation of the EHR. According to Faryar (2013), emergency departments in hospitals see more patients during a holiday season than any other days of the year. This could be due to the business hours of primary care clinics who may be closed on holiday, and patients would have no choice but to visit the emergency department. For example, an article of the *Emergency Medicine Journal* (2007) revealed that, on average, 59.77 more patients visited the hospital on holiday days.

Therefore, it may be extremely significant to determine EHR implementation based on the
hospital’s statistical findings of the hospital’s patient volume on holidays days. For example, if the hospital does not usually treat a high volume of patients from early February to Mid-March, the hospital may consider implementing a new EHR during that time period.

It may also be safe to assume that the procedure of diverting low-acuity patients to an offsite unit consumed a higher number of staff that could have been contributing to treating patients in the ED. The length of procedure (diverting patients to an offsite clinic) could have also been prolonged due to the EHR implementation. This merely suggests that the combination of both assumptions in association to the holiday season and the diversion to an offsite clinic may justify some of the delay in patient flow.

Another concern surrounding this study is the timeline of EHR implementation. Each hospital should evaluate the timeline that would be beneficial to their implementation; however, some timelines could either be longer or shorter than the necessary implementation time. A study by Park, Tantama, Fallgater, & Riffenburgh (2009) that was extremely similar to this study in the time window the implementation occurred (i.e., starting in September) and the key factors that were considered such as LOS (length of stay) and LWBS (left without being seen). Both studies had phased their implementations where the final phases witnessed rapid improvements in patient flow. This suggests that most of the staff gained the sufficient knowledge needed to contribute to patient flow acceleration. It would, therefore, be ideal to educate the staff about the use of EHR prior to going live. In doing so, physicians can be assigned to utilize the EHR system on a number of visits, and over time, all patients would be entered in the system. According to Verdon (2013), the strategy of assigning patients to a set number of EHR-patients would aid in implementing the EHR system in stages while continuing to utilize the old system, which could result in maintaining the patient volume as well as patient flow.

**Conclusion**

It is no doubt that hospitals are now considering the implementation of an EHR to improve the efficiency of their work. Finding the right strategy during implementation is extremely essential. What seems to be ideal for most is evaluating their patient flow by quantifying the patient volume and identifying key factors that play essential roles in potentially maintaining patient flow. Avoiding implementation during holidays and implementing during low-census periods may be extremely ideal, especially for an emergency department. This way that hospital can fully utilize its staff while paying an adequate focus on EHR implementation. This would ultimately result in possibly reducing the time of implementation and time of conversion from the old system to the new system. This is extremely significant in order to avoid as many holidays as possible in the case the implementation could take up to one year.

**REFERENCES**


