

Example of research supporting purchase of an research paper

[Business](#), [Management](#)



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Electronic Medication Administration Record System

Research Supporting the Purchase of an

Electronic Medication Administration Record System

Introduction

Medication errors in the United States are estimated to cause approximately 7000 deaths annually and cost approximately \$2 billion in added health care spending. Improving the safety outcomes of medication-use processes in hospitals has been cited as a means of addressing this issue. Careful and planned use of information technology is a proven approach to solve a majority of medication errors made with paper-based systems (Paoletti et al., 2007). Computer-based systems have been found to provide much better compliance with the “ five rights” of medication administration: right patient, right dose, right route, right time, and right medication (Hook, 2008).

Accordingly, the present paper describes research and justification for the purchase and implementation of an electronic medication administration record (eMAR) with a bar-code component in this organization. The current technology utilized is assumed to be a manual, paper-based, five day MAR.

Relation of System to Needs of the Hospital

The need for an eMAR system within the organization can be seen through evidence of the likely current error rate for medication administration. A pre-implementation study for an eMAR system within a similar hospital setting revealed a total of 188 errors over a five-day period (Paoletti, 2007). There is no basis for assuming that the error rate within our hospital is particularly better or worse than this evidence-based rate. In particular, the majority of the errors in the pre-implementation study were classified in a first category of wrong time (15 of 188), or late administration. However, a second category of errors included problems such as omission (15), wrong technique (14), wrong dose (6), extra dose (5), wrong medication (3), wrong route (1) and wrong formulation (1) (Paoletti, 2007). It is this second category of errors that would be targeted by the proposed new eMAR system and would enhance the economic environment of the hospital most directly.

Description of the Proposed System

A projected workflow for the system recommended for purchase is included in Figure 1. The new eMAR system would require both hardware and software purchases. Software needs would be the eMAR program itself and any supportive bar-code aspects not included in the eMAR system. Programs available from commercial providers should be reviewed for conformity with

the needs of the hospital, as found by a committee appointed to lead up this project. Unless there are highly specialized needs within the hospital, it is anticipated that an off the shelf software system would be the best choice, although customization could be available if needed. Another possibility would be software as a service (SAAS), therefore a cloud-based system. Whether a software or cloud based system is selected, consideration should be made for the inclusion of technical support time from the software provider within the purchase contract. An estimated budget for this project would be approximately \$500, 000 and could be more if specialized software adaptations are required. If an SAAS solution is selected, although there may be less initial up-front installation costs, it should be noted that licensing fees will be an ongoing expense that will need to be budgeted.

Some of the hardware of the required system would include computer terminals or tablets that have attached scanners for the bar-coding aspects. The ideal situation is one computer/tablet for each patient room, as rolling terminals have proven an issue with workflow and storage space issues, and a budget to cover this situation is urged. Other hardware needs are for producing labels for both patient bracelets and drug containers that would be located at patient intake and the pharmacy, respectively. Consideration should be given to wireless and/or networked implementation of the system, as this would help relieve the need for wires to connect this system, promote more efficient connections between the components of the system, make the system much more portable, and result in less space impact overall. One key component of the eMAR system would be immediate real-time warnings that would alert medical personnel to discrepancies when the

various actions are entered into the system while medication administration is being performed. The real time alert would function to stop activities that contradict what had been placed in the patient's record as being prescribed. A second key component of the eMAR system would be a historical reporting function of the number of errors caught, thus justifying the presence of the system. One possible historical report would be a prevented medication error report that would show times when warning notices were displayed to the nurse or other provider administering the medication, but changes were made in order to bring the administration into compliance with the order. A second would be a possible medication error report that would show where the system was not being used correctly, that is, a warning error is displayed but medication administration continued (Paoletti, 2007). Both of these reports will provide valuable data concerning the benefits of the newly implemented system.

The proposed eMAR application would be ultimately implemented across all units within the hospital. By aiming for a hospital-wide application, the reduction in risk and improved patient outcomes discussed more extensively below would have the greatest likelihood of being achieved.

Management and Organizational Goals Met by System

One primary management goal met by this system is increased quality assurance. Studies have shown that utilizing an eMAR system reduces medication administration errors (Paoletti, 2007), particularly with the real-time conflict alert function, as discussed above. The system essentially provides an added layer of review of medication administration that is not

subject to work-related stress, hectic environments, or distracted attention that can occur with human oversight. The use of such an eMAR system also provides employee development, a second management goal. Medical care is becoming more and more dependent on information technology tools and employees within the medical system need to be able to use these tools. Implementation of this system within the hospital will provide its employees the training and experience with a tool that has become widespread within the medical industry.

This system also has economic impact through reduced malpractice risks to the hospital. These systems target those errors most likely to be involved in malpractice situations (Paoletti, 2007). Reduced malpractice costs will increase revenues for the hospital, a further management goal, through reduced malpractice insurance premiums and any other malpractice costs incurred. Malpractice also has impacts on hospital reputation that can be avoided if the errors do not happen. Finally, it is also likely that a perception that our hospital utilizes the latest technology to support patient safety and quality of care will increase referrals to the hospital, thereby also increasing revenues.

Summary Justifications for Making the Expenditure

The present paper provides a case for the implementation of an eMAR system with bar-code capabilities in our hospital. Although there are current ongoing efforts to avoid medication administration errors, there is evidence that even the best of paper-based systems still have multiple points of weakness where problems can occur. Most, if not all, of these problem areas

can be addressed using an e-MAR system such as the one proposed. Such a system will address over-arching organizational goals such as high quality patient care and employee oversight. It will also address many management goals such as quality assurance, employee development, and increased revenue. Admittedly, the purchase and implementation of an e-MAR system will be expensive in both money and time invested. But the ultimate goal of greatly improved patient safety and quality assurance that is provided by this information technology system justifies this expensive expenditure many times over.

Figure 1 -- Workflow for eMAR (Ola-Weissman, 2013).

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