

TECHNICAL FACTORS AND USING OF COMPUTERIZED PHYSICIAN ORDER ENTRIES (CPOE) IN HEALTHCARE ORGANIZATIONS

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Abstract

Computerized Physician Order Entries (CPOE) is computer-based systems that share the common features of automating the medication ordering process and that ensure standardized, legible and complete orders. This paper describes the factors which are recognized to be affecting of using CPOE in healthcare organizations. The paper discusses also the general using of CPOE. In this paper describes challenges of using CPOE as Limited Ability to Access External and Data Concerns Related to Workflow and Efficiency. Concludes of the paper and the future work are also presented.

Key words: Computerized Physician Order Entries (CPOE), Information Communication Technology (ITC) and Healthcare Information Technology (HIT).

1. INTRODUCTION

The Information Communication Technology (ICT) has recently become widely used in almost every aspect of life and its use has extended to cover a wide variety of applications in education, business, healthcare and others. ICT applications are vital in the healthcare information technology, as ICT plays a fundamental role in improving the healthcare services in terms of communication amongst the users, organizing the patients' records, medical operations and performance. Healthcare Information Technology (HIT) can have different models such as Electronic Medical Record (EMR), Electronic Health Record (EHR) and Computerized Physician Order Entry (COPE), all which have emerged as a promising field for improving the overall medical services and performance (Cambridge, 2010; Beaver, 2003; Kearns & Lederer, 2000).

Healthcare organizations are increasing their reliance on CPOE access patient medical records at the point of care. EMRs access to patient records improves the productivity of healthcare professionals and enhances the accuracy of their diagnosis. The usings of CPOE are still hindered or have many challenges that inhibit its use and spread. Though, the technology is available for a CPOE, there are several barriers or obstacles that must be overcome for the system to be successful and effective. Technology has continued to move forward at a rapid pace, but many technical issues have slowed down the pace of using of automated systems for an electronic documentation record (Young, 2000)

The paper is organized as follows: Section 1 Introduction including describes of the Information Communication Technology and Healthcare Information Technology, while section 2 discusses the Overview of Computerized Physician Order Entries implementation Hospitals, section 3 describes challenges of using CPOE as Limited Ability to Access External and Data Concerns Related to Workflow and Efficiency, while section 4 concludes the paper and presents the future work.

2.COMPUTERIZED PHYSICIAN ORDER ENTRIES (CPOE)

Computerized Physician Order Entry system known is the one type of the portion of HIT that enables a patient's care provider to enter an order for a medication, reduce medical errors, clinical laboratory or radiology test, or procedure directly into the computer. CPOE is computer-based systems that share the common features of automating the medication ordering process and that ensure standardized, legible, and complete orders. CPOE can make communications between users easier and retrieval data (Kaushal, Shojania, & Bates, 2003; Aarts, & Koppel, 2009).

In United States, every year an estimated of one million medication errors occur and around from 50,000 to 100,000 people die from adverse drug events. Many of these errors can be prevented or reduced by widening the use of already existing technologies. Not only the CPOE automates the order-writing function, but it also incorporates clinical decision support during the order-entry process. When used to its full potential, CPOE can save lives and save money (Gunter, & Terry, 2005; Aarts et al., 2009).

CPOE is a technology that has demonstrated a wide range of quality and cost benefits for patients, payers and physicians themselves. With guided orders, alerts and access to patient-specific clinical information, doctors can make better decisions that lead to improved patient safety, decreased errors and more efficient resource utilization (Gunter et al., 2005).

CPOE can:

- Eliminate handwritten prescriptions that are often illegible.
- Reduce adverse drug events.
- Lower drug costs.
- Decrease duplicates testing.
- Save money for physicians and payers.

Although only one-third of the hospitals in the United States have installed CPOE systems and only 1 percent of these requires the physicians to use them. The success and failure of such a system is dependent on the acceptance by the users. There are many barriers or obstacles that face the using of this kind of software as such these systems (CPOE) are not designed to address usability issues. They are hard to use, hard to learn, and they often generate user frustrations and abandonment (Gainer et al., 2003; Rosse, Maat, Rademaker, Vught, Egberts, & Bollen, 2009).

3.CHALLENGES OF USING CPOE

The traditional paper medical record (PMR) has various shortcomings that not only limit efficiency, but can also be of hindrance to effective and timely treatment to patients. Such shortcomings include limited availability and accessibility, poor legibility, and missing information. Often critical patient data can be missing from the PMR, the data could have been incorrectly recorded without validation leading to inaccurate data on file, and also hand written information may not be legible.

Healthcare organizations are increasing their reliance on CPOE to access patient medical records at the point of care. access to patient records improves the productivity of healthcare professionals and enhances the accuracy of their diagnosis. The using of CPOE are still hindered or have many challenges that inhibit its use and spread. Although the technology is accessible for CPOE there are several barriers that have to be tackled for the system to be successful and effective. Next section will discuss about technical factors of (CPOE) in healthcare organizations

3.1 LIMITED ABILITY TO ACCESS EXTERNAL DATA

Exchange of data between CPOE and the users and other clinical data systems is important to reduce the medical errors. One of the medical errors is that different physicians treating the same patient, do not have access to all the patient's medical records or they do not have all data about the history of their patients, such as lab test results and others. The CPOE does not cover all application areas, and all information types that constitute the medical record because it needs high costs (Leitman, 2001; Poon, Blumenthal, Jaggi, Honour, Bates, & Kaushal, 2004; Pourasghar, 2009).

One of the major barriers to the widespread adoption of Computerized Physician Order Entry system is the limited ability to access health information from external sources. “Interfaces” are pieces of software that allow different systems to communicate with one another and securely transfer information in one or two directions. Unless the user can access externally created information (such as lab test results), the CPOE is restricted in its ability to provide a comprehensive view of patient care (Poon et al., 2004; Lyons, 2007; Ellero, 2009).

Apart from the positive side of Interfaces, they are complex and costly to develop. Usually the software vendor and the health information provider share the expense of development; however, the purchaser ultimately bears the cost. There is a need for a simplified standards-based approach to creating interfaces. In the future, intelligent “middleware” should allow different systems to speak easily to one another (Poon et al., 2004; Ellero, 2009; Greenburg, Dressler, Gejdos, Butt, & Davenport, 2010).

There is a lack of standards to interchange information. While a number of standards exist to transmit pure data, such as diagnosis codes, test results, and billing information, there is still no consensus in areas such as patient signs and symptoms, radiology and other test interpretation, and procedure codes. Although some associate the National Library of Medicine’s Unified Medical Language System (UMLS) with a comprehensive clinical vocabulary, its goal is much more modest, to serve just as a meta-thesaurus linking terms across different terminology systems. The lack of UMLS makes it impossible to share the systems of EMR with each other, and too difficult for the out users to access to get what they need (Hersh, 1995; Pourasghar, 2009).

Although, they still have some challenges of limited access from out of the CPOE, a number of systems have been successful in limited domains, the technology for natural language processing (NLP) is still unable to interpret narrative text with the accuracy required for research and patient care applications (Hersh, 1995). A study by the American College of Rheumatology (ACR) asserted that EHR systems should have the ability to integrate laboratory and imaging results, procedure notes, inpatient and outpatient clinical documents, and should not be limited access (Mosley & Williams, 2005).

The lack of limited access to health information from external sources and the lack of data sharing with users is already causing major barrier in the widespread using of the electronic medical record systems. Thus, the lack of sharing data between the users to access information for patients will make their work limited. Furthermore, there is a lack of adequate electronic data exchange between the CPOE and other clinical data systems (such as lab, radiology, and referral systems). Given the two system available simultaneously, physicians were recognized as to switch between systems, thereby slowing workflow, requiring more time to manually enter data from external systems, and increasing physicians' resistance to CPOE use. Next section wills discussion of other factor called concerns related to Workflow and Efficiency.

3.2 CONCERNS RELATED TO WORKFLOW AND EFFICIENCY

Workflow and Efficiency for technologies of CPOE can increase productivity for staff, and greatly reduce risk for hospitals while, at the same time, improving patients services document management as well as efficiencies of electronic filing. One of the most highly cited reasons for failed clinical systems is due to interference with established practice routines and workflow (Anderson, 1997; Lorenzi and Riley, 1997; Ash, Anderson, Gorman, Zielstorff, Norcross, Pettit, Gianguzzi, 2002).

To borrow from CPOE literature, using of an CPOE impacts workflow, polices, procedures, and interactions among individuals and groups (Anderson, & Knickman, 2001; Baron, Fabens, Schiffman, & Wolf, 2005). Changing familiar routines is considered to be a loss due to reduced productivity during the learning curve (Lorenzi, 2000; Pearsaul, 2002; Baron et al., 2005; Zandieh, Yoon, Kuperman, Langsam, Hyman, & Kaushal, 2008).

Within CPOE literature concerning the workflow and efficiency, some studies had investigated the new physicians’ role and the prospective workload that might occur via the CPOE using. CPOE changes the way clinicians record, retrieve and use clinical data (Lorenzi et al., 1997). Physicians expect information systems to support clinical processes without increasing workload or shifting work to other staff in order to be successful (Rogoski, 2003; Hersh). Physicians have traditionally used clinical information systems to access data, but have not performed data entry functions themselves.

However, computerized physician data entry is a significant barrier to CPOE adoption (Pearsaul, 2002; Simborg, 2008), and changing practice behavior will require a social change within the physician community. The content, sequence and format of some CPOE applications may not reflect the practice styles of some physicians (Anderson, 1997; Gianguzzi, 2002; Simborg, 2008).

Typing text is time-consuming and requires a higher cognitive load than handwriting text (Anderson, 1997). Structured data entry, which involves selecting the correct term from a coded list, is restrictive, often requiring more work for the physician to locate the correct term. In addition, sometimes the coded term can change the meaning of a clinical concept (Anderson, 1997; Rogoski, 2003; Simborg, 2008). By the same token, similar challenges to the workflow and efficiency of CPOE might be also applicable. The new roles of physicians regarding the computerized data entry and their prospective workload might be possibly considered among the factors that have negative effects on the using of CPOE.

4. CONCLUSION AND FUTURE WORK

The paper shows how using of CPOE can be affected by Technical Factors and issues that affect the using of CPOE. Future work in these area can be to investigating the effects of CPOE usings on the total quality of care as perceived by the medical user such as physicians at Jordan tat will be undertaken based on the Technology Acceptance Model (TAM). The instrument of this research may be prepar as a Quantitative research and will be used to collect the current stat and users perceptions that use CPOE from some hospitals in jordan . Therefore, the researcher strongly believes that a comprehensive investigation of these barriers will increase the understanding of what shapes the use of CPOE and put forward new insights into the internal and external variables that contribute to the adoption or the rejection partial or full of the CPOE software.

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