

Chapter 5

Electronic Medical Prescription: An Overview of Current Status and Issues

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ABSTRACT

Even today most medical prescriptions are typically handwritten or printed on paper and hand-delivered to pharmacists. Paper-based medical prescription is generating major concerns as the incidences of prescription errors have been increasing and causing minor to serious problems to patients, including deaths. Most of the problems of paper-based prescription can be avoided by electronic medical prescription, also variously known as electronic prescription, e-prescription, or electronic transmission of prescription. Though the basic concept of e-prescription is simple, e-prescription has not yet been widely adopted, despite advances in information and communication technologies – it is, in fact, just in early stages of adoption in a few countries only. To facilitate wider adoption of e-prescription, several technical and non-technical issues need to be addressed. This chapter presents an overview of electronic prescription. Beginning with an introduction to e-prescription, it examines various aspects of the e-prescription system, and describes and evaluates various e-prescription models and systems. The chapter then discusses technical and non-technical issues in implementing e-prescription, and concludes with our recommendations.

INTRODUCTION

Traditionally, medical prescriptions by doctors have been typically handwritten or printed by computer on paper and hand-delivered to pharmacists. Paper-based medical prescription is, however, causing

increasing concern as incidences of prescription errors have been increasing causing minor to serious problems to patients, including deaths. Most of the errors of paper-based prescription could be eliminated or minimized by electronic transmission of prescription (ETP), also known as electronic prescription or e-prescription. Though e-prescription is simple and straightforward, it has not yet been

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widely adopted; it is, in early stages of adoption just in a few countries. Several technical and non-technical issues hinder its widespread adoption.

In this chapter, we present an overview of electronic prescription, providing a snap-shot of its current status and highlighting its issues and barriers. We identify the limitations of the paper-based prescription system, and describe the e-prescription system and discuss its benefits. We then present different e-prescription models and systems that are in use and evaluate them. We also examine technical and non-technical issues in implementing e-prescription, and offer our recommendations.

MEDICAL PRESCRIPTION: CURRENT PRACTICES AND THEIR LIMITATIONS

Even today, handwritten or printed paper-based medical prescription is the most common way doctors prescribe medicines to patients. In this traditional system, patients visit their health care provider for consultation, and after assessment of the medical condition of the patient the doctor writes or prints off a prescription on a paper. The prescription is then signed and given to the patient; the patient or his/her authorized representative presents the prescription to a pharmacy of his/her choice for getting the prescribed medicines. In most countries, where pharmacies use computer-based system, the pharmacist enters the medication details into the system and gets usage labels for the drug printed. The patient or his/her representative receives the drug and signs on the prescription form confirming the receipt of the medicines.

Though the paper-based prescription system has been in practice for decades, it is susceptible for several types of errors at each step in the process. These errors are the result of a myriad of difficulties such as lack of medical information integrity and sharing, drug cross-reactivity and complications,

incorrect or inadequate physicians' knowledge about the new medications, slow prescription ordering and dispensing process, security and privacy issues, lack of standardization of technologies and protocols used, and administrative and organizational issues such as pharmaceutical benefits and billing process. Incidences of prescription errors have been increasing contributing to minor to serious problems to patients, including deaths. Fatal health problems can arise due to adverse drug effect (ADE) resulting from erroneous prescription, illegibly written prescriptions, errors in dosage and unanticipated drug interactions, communication errors committed during ordering, dispensing and administering of drugs, and dosing mistakes such as incorrect dose of drug and incorrect frequency of drug intake, and lack of reliable health information.

For instance, ADE was identified to be the sixth leading cause of mortality (Lazarou et al., 1998). According to the Australian Department of Health and Aging (2006), estimated 400,000 ADE incidents occur in Australia each year. ADE related incidences occur in hospital settings due to errors in dosing or order. Estimates reveal that annually between 44,000 and 98,000 people may die as a result of medical errors (Australian Department of Health and Aging, 2006; Thomas, 2001). Medical statistics confirms that this erroneous practice happens to 2 to 7 patients out of 100. Every year there were about 150 million inquiries from pharmacies to physicians discussing prescription problems (Richards, 2003). According to the study conducted by the Institute of Medicine (Caine, 2003; Weinstein, 2005) annually around 7,000 American citizens die due to medication errors that could have been avoided if only the prescriptions were handled properly by the health professionals. The main causes of the above deaths were wrong dosage, unexpected drug reactions, lack of knowledge of the formulary slip-ups, and unreadable paper prescriptions. Additional expenses due to these avoidable mistakes account for US \$77 billion every year (Caine, 2003; Weinstein, 2005).

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