

Chapter 30

Expanding Role of Telephone Systems in Healthcare: Developments and Opportunities

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ABSTRACT

The telephone systems in healthcare settings serve as a viable tool for improving the quality of service provided to patients, decreasing the cost, and improving the patient satisfaction. It can play a pivotal role for transformation of the healthcare delivery for embracing personalized and patient centered care. This chapter presents a systematic review of new developments of healthcare telephone system operations in various areas such as tele-health. Current research on topics such as tele-diagnosis, tele-nursing, tele-consultation is outlined. Specific issues associated with the emerging applications such as under-referral, legal issues, patient acceptance, on-call physician are discussed. Meanwhile, the architecture and underlying technologies for healthcare telephone systems are introduced, and the performance metrics for measuring the system operations are provided. In addition, challenges and opportunities related with improving the healthcare telephone systems are identified, and the potential opportunities of optimizing these systems are pointed out.

1. INTRODUCTION

Telephone systems are an indispensable part of healthcare units. Coile (1999) indicated that the conventional call centers in various healthcare settings could enhance their means for 275 million health consumers to receive better health service. The telephone systems guide the patients to receive the care,

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education, or related information. As such, the systems can be often considered as the entry gate for patients and other users of healthcare systems, and they present an immense opportunity to improve healthcare delivery, such as the efficient communication services for health care delivery especially in the laboratory medicine (Coiera, 2006), and supporting the functions of information technology for providing better care service (Schweiger et al., 2007).

The telephone systems in healthcare units usually involve the interaction and information exchange between the patients or their important ones and the customer service agents, nurses, or providers, with the help of telecommunication technologies. The systems can provide a variety of services such as scheduling an appointment, health consultation, medication refills and renewals, enrollment, and co-pay. Stier (1999) indicated that the telephone systems provide substantial benefits for stakeholders in healthcare systems. Individuals who are looking for medical information to address their future health related problems or who are joining new healthcare insurance plans and would like to acquaint themselves with providers might reap substantial benefits by using those systems. In addition, hospital associates for arranging the transfer of patients within and between healthcare centers may also obtain timely and accurate information using the telephone systems. With the help of the telephone systems, the quality and efficiency of healthcare delivery systems can be significantly enhanced.

From the perspective of improving service quality and operation efficiency, this chapter reviews the new developments on telephone systems for healthcare delivery and identifies the challenges that the systems face and the potential opportunities for improvement and optimization. The organization of this chapter is as follows. In the second section, the architecture and functions of telephone systems for healthcare delivery are briefly introduced. In the third section, the indices for measuring the system performance are summarized. In the fourth section, the research progress and the expanding role of telephone systems for healthcare delivery are presented. In the fifth section, the challenges in optimizing the healthcare telephone systems are specified and analyzed. In the sixth section, the potential opportunities to improve service quality and operations efficiency are demonstrated. Finally, conclusive remarks are provided.

2. TELEPHONE SYSTEMS OPERATIONS AND TELE-HEALTH

Figure 1 illustrates the operations and activities of a typical healthcare telephone system. The schematic chart shows how a telephone system guides patients to communicate with clerks, nurses, physicians, or health counselors to obtain services. The data and education information flow is between the patients and the various units in the system. To cite an instance, a patient might provide his/her preferences on appointment date/time, and based on the data fetched from the database, a clerk/scheduler can provide the patient an appointment date/time that considers the patient preferences and the availability of clinic resources. On the other hand, the healthcare telephone systems might also be considered as a medium for dispensing information/education to the patients. For example, based on the triage algorithms implemented in the system, a nurse can decide whether the patient should be referred to another hospital. The services that can be obtained by the patients range from simple operations such as scheduling an appointment and medication refills, to complicated operations such as tele-nursing. In the telephone systems, more components such as tele-nursing, tele-counseling, tele-triage, computer telephony and computerized expert systems have been added (Mohan et al., 2004). In general, these components are also within the domain of tele-health. While the telemedicine and tele-health terms are used interchangeably in some cases (American Telemedicine Association, 2009), many believe that tele-health extends beyond the

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