Developing a framework for meaningful use of personal health records (PHRs)

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Abstract

Significant advancements have been made in the technological development of the personal health record (PHR). The goal of the PHR is to encourage patients and health consumers to take individual responsibility for their health by being more engaged in the health care process through the use of the PHR. Many PHR applications are extensions of the electronic health record (EHR) and have limited patient input in their design. As more patients and health consumers use PHRs, there is an increasing need to understand the ways in which patients or health consumers use them. The major objective of this paper is to introduce a framework for understanding meaningful use of PHRs and to discuss the associated challenges that may impede meaningful use. The primary challenges that may hinder meaningful use of PHRs relate to health system challenges such as health care regulatory and managerial policies and multiple institutional, societal, cultural, and economic issues. Additional challenges, such as technology, design, usability, and implementation, still exist that relate to socio-technical issues.
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Introduction

The personal health record (PHR) has become a focal point in the 21st century for a number of trends characterizing medical informatics and health information technology and their intersection with community health. "Meaningful use" of EHR is stipulated in patient-centered care, patient-provider partnerships, accountable care organizations (ACOs) and US Medicare and Medicaid programs (for reimbursement for providers the American Recovery and Reinvestment Act), and these stipulations can be seen as converging on the ultimate goals of the empowered consumer of health care and preventive services [1].

The personal health record is defined as:

> *An electronic application through which individuals can access, manage and share their health information, and that of others for whom they are authorized, in a private, secure, and confidential environment* [2].

Personal health records have a variety of benefits to the health consumer such as providing credible health

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information and improve communication between the health consumer and their health provider [2]. In addition to this, the personal health record for education and research. PHRs are classified as 'standalone' and 'tethered' [3]. In standalone PHRs patients enter their own data into the PHR. With the tethered PHR, hospitals input the necessary data into the PHR from the hospital information system. More recently, the PHR has evolved into a more integrated personal health record system which has become more consumer centric [3]. Integrated PHRs, promote "active, ongoing patient collaboration in care delivery and decision making" [3].

There still remains some controversy with the PHR, especially as it related to privacy. There has been emphasis on the protection of patient privacy through the implementation of various laws to protect health information. For example, in the 1960s, Curran, Steams, and Kaplan, advocated for state laws for clearly defined regulations regarding the protection of health information. It was not until 30 years later that the United States passed the Health Insurance Portability and Accountability Act (HIPAA) to protect the privacy and confidentiality of health information [4]. Although various laws have been enacted to protect health information, a Markle survey of health reported that privacy around the exchange and use of health information through was a top concern for physicians and patients [5]. Patients may still fear that their health information could be violated through the PHR and used by unscrupulous individuals or organizations against them.

Although privacy is a concern with PHRs, many PHR systems remain physician-oriented with few patient-oriented functions to empower meaningful use by the health care consumer [6]. As future PHR developments include more patient-oriented functions, there will be a growing need to develop Personal Health Records with the end user as the primary driver in the development of PHR systems. Future PHRs will be developed for the needs of the health consumer by engaging them from the start of the design and development process. There are several challenges that must be addressed. The objective of this paper is to present the following: (a) a framework for meaningful use of the personal health record by the patient, (b) a discussion of the relevant literature, (c) and a discussion of the current challenges in developing patient centered personal health records for relevant use by patients or health care consumers. Defining "meaningful use" will be the initial focus of the paper.

Defining meaningful use

Meaningful use was first introduced by the Medicare and Medicaid EHR Incentive Program of the U.S which includes five pillars of health outcomes priorities [7]:

1. Improving quality, safety, efficiency, and reducing health disparities
2. Engage patients and families in their health
3. Improve care coordination
4. Improve population and public health
5. Ensure adequate privacy and security protection for personal health information

There has been interest in a number of countries about how "meaningful use" has been articulated (e.g., Denmark, Sweden, and New Zealand) and how the concept has been applied in evaluating EHR technology usage [8]. According to the U.S. Department of Health and Human Services, meaningful use can be defined as health professionals (e.g., physicians, nurse practitioners) and health care organizations (e.g., hospitals) meeting specific criteria for using EHR technologies so that improvements in patient care can be made.

In many cases, financial incentives are provided to encourage health care providers and health care organizations to implement meaningful use of EHR technologies [9]. To receive an EHR incentive payment, providers must show that they are "meaningfully using" their EHRs [7]. The meaningful use criteria are subdivided into 3 stages. In stage 1, meaningful use criteria highlight the importance of health information, focusing on health information being recorded in a standardized manner and being communicated for the purpose of coordinating care. Included in this meaningful use is reporting on and tracking of information about key clinical conditions, clinical quality and public health and using this information to help patients/families with health care. Stage 2 criteria focus on health information exchange, including the increase in requirements concerning e-prescribing and reporting of laboratory results. This work includes the transmission of electronic patient care summaries across settings and the provision of opportunities for patients to control more of their data. Stage 3 addresses the need for improved safety, quality and efficiency. Decision support tools for health professionals, patient self-management tools, comprehensive health information exchange and public health are essential to Stage 3 work [10].

Meaningful use and personal health records

Meaningful use has emerged as an important criterion for determining effective use of electronic health records nationally in the United States and internationally. Countries such as Canada [11], Denmark and Sweden [12] are developing and reviewing definitions and criteria for using specific features and functions of electronic health records. Governments and health care administrators are identifying the expectations for physicians and other health professionals (such as nurses and nurse practitioners) in terms of the meaningful use of the electronic health record. The United States government defines "meaningful use" as part of the EHR Incentive Program and outlines the EHR features and functions required to achieve "meaningful use", including the following expectations for physicians: (1) use computerized direct entry of medical orders, (2) maintain an up-to-date list of current and active diagnoses, (3) maintain active medication and medication allergy lists, and (4) record patient demographics and vital sign changes. It is anticipated that by meeting the objectives of meaningful use, EHR usage by physicians and other health professions will progress through a series of stages from data capture and sharing to the use of EHRs to advance clinical processes and improve outcomes [8,11,12]. The intent of meaningful use is to achieve health care system reform by redesigning health care processes using the EHR