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Ebrahim Randeree  
*Florida State University*

Melinda Whetstone  
*Florida State University*

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# PERSONAL HEALTH RECORDS: ADDRESSING THE CONSUMER NEEDS

**Melinda Whetstone, Florida State University, [mrw06j@fsu.edu](mailto:mrw06j@fsu.edu)  
Ebrahim Randeree, Florida State University, [eranderee@ci.fsu.edu](mailto:eranderee@ci.fsu.edu)**

## Abstract

*The introduction of Personal Health Records (PHRs) has occurred as a result of the IOM's direction to improve health care quality and make it more patient-centered, as well as demands from patients for more control of their health data. The PHR addresses timeliness, patient safety, and equity. The PHR is also integral to the National Health Information Network (NHIN) being designed to give all Americans access to electronic health records by 2014. Despite increasing access to PHRs via employers, insurance companies, healthcare providers, and independent entities, adoption and successful implementation of the PHR as well as other types of electronic records ( Electronic Medical Record (EMR) and Electronic Health Record (EHR)) is unclear. The specific interaction and distinction between these records is also unclear. This article differentiates the PHR from the other records, introduces the notion of ownership of medical information, and presents a basic research model regarding PHR adoption and diffusion.*

## KEYWORDS

Patients, Personal Health Records, Electronic Medical Records, Electronic Health Records

## Introduction

The estimates of between 44,000 and 98,000 deaths (Institute of Medicine, 2001) in the United States attributed to medical errors provided a shock to the healthcare industry. Even more alarming was the realization that most of these deaths were due to preventable mistakes of overuse, underuse, or misuse (Kohn et. al. 2000). As a result, the Institute of Medicine (IOM) issued six aims for improving healthcare: safety, effectiveness, patient-centered, timeliness, efficiency, and equity (IOM 2001). These improvement aims required a comprehensive redesign in how care is provided to patients; with information technology as the foundation for delivering and monitoring the redesign.

In 2004 President Bush further raised expectations for the American healthcare system when he signed Executive Order 13335, calling for “the development and nationwide implementation of an interoperable health information technology infrastructure to improve efficiency, reduce medical errors, raise the quality of care, and provide better information for patients, physicians, and other health care providers” (Brailer 2005). This directive further called for “widespread adoption of electronic health records (EHRs)” by 2014 “so that health information will follow patients throughout their care in a seamless and secure manner” (Brailer 2005).

These steps toward an emerging national health network, however, require additional support from the general consumer. When the National Committee on Vital and Health Statistics (NCVHS) (2001) proposed its vision for building a national health information infrastructure, the three key stakeholders identified were the community (“population health”), the healthcare provider, and the general consumer (“personal health”). Subsequently, the four companies chosen to present proposals for national health information network (NHIN) have put forth efforts that incorporate this personal health dimension, in accordance with this vision of consumer empowerment and patient control of health data. Given the import placed on the consumer’s involvement in healthcare, it is imperative for the means to be made readily available.

As such, Personal Health Records (PHRs) have emerged as a new option for patients to take control of their medical data and to become active participants in the push towards widespread digitized healthcare. The potential benefits of a PHR to patients, their physicians and the health care system are numerous (Tang and Lansky 2005). These include: patient empowerment, improved patient-provider relationships, increased patient safety, improved quality of care, more efficient care delivery, better safeguards on health information privacy, and cost savings (Endsley et al. 2006). Additionally, the PHR serves to meet the IOM’s aims for timely and efficient health care delivery. Specifically, by making use of Internet-based communication (i.e., e-visits, telemedicine), both patient and healthcare provider can have immediate access to automated clinical information, diagnostic tests, and treatment results (Endsley et al. 2006).

Access to PHRs is steadily increasing with players from several arenas, including corporate America and universities, driving adoption. However, the biggest impact may come from major insurers and hospitals that are increasingly adopting active electronic medical records (EMRs), moving the nation closer to a national health network. For example, Aetna recently unveiled a plan to give 15 million subscribers access to their health information (Havenstein 2007) with more insurers following suit, while, Kaiser Permanente plans to make available medical records - including histories, lab results, progress notes and prescriptions - to 2 million patients (Hines 2007). Even with all this, nearly half of all Americans are still unaware of PHRs (Sprague 2006), and the confusion of EMRs, EHRs, and PHRs still persists.

This paper contributes to the existing literature on innovation adoption in three ways. First, it looks at how PHRs are different from EHRs in their design and provides a framework for discerning different electronic medical solutions. Second, it presents a basic model that identifies conceptual variables that affect adoption and dissemination of PHRs; it introduces the notion of ownership of medical information and the possible consequences. Finally, it presents future research for study for successful PHR implementation.

## Record Types

In order to fully describe a PHR, it must be viewed in context of other electronic records used in the medical community. This section serves to describe the three main record types, EMR, EHR and PHR, and provide insight into the record’s source for creation and maintenance (Table 1).

**Electronic Medical Records and Electronic Health Records:** The term electronic health record (EHR) is often used interchangeably with other terms, such as electronic medical record (EMR). Although the concepts are similar, the EMR is considered a subset of the EHR, an encompassing concept for health information (Stead et. al. 2005). This relationship between the EHR and EMR is further described by Garets and Davis (2006) in that “the EMR is the legal record created in hospitals and ambulatory environments that is the source of data for the EHR,” and, further accentuating the point that the records are separate entities, that EHR adoption is dependent on the existence of EMRs. Additionally, the two records have

been described and differentiated as a “doctor-centered” EMR and a “patient-centered” EHR (Lowes 2004), as a means to reflect the change in healthcare momentum from medically-focused to health oriented, a redirection initiated by the IOM (2001).

A specific description of an EMR is often made in light of its means for creation. Stead et. al. (2005) describe the EMR as records that are “generated as a by-product of []” a healthcare provider’s EMR system (EMRS). The EMRS is “an application environment composed of the clinical data repository, clinical decision support, controlled medical vocabulary, order entry, computerized provider order entry, pharmacy, and clinical documentation applications” (Garets and Davis 2006), or “a computerized platform for managing detailed medical information collected during a hospital stay or in a doctor’s office” (Connecting for Health 2003). This latter definition can be extrapolated to mean that an EMR is used solely by the provider (physician, clinic, hospital) to document a patient’s periodic care (Upham 2004).

The foundation for an EHR’s definition in which there is general agreement is that an EHR is a “repository of information regarding the health of a subject of care in computer processable form.” (International Organization for Standardization (ISO) (2005)) and that it contains “any information in electronic form about a person that is needed to manage and improve their health or the health of the population of which they are a part” (Stead et. al 2005). ISO (2005) proceeds to extend this definition for purposes of integrated care in that the information is then, “[]stored and transmitted securely, and accessible by multiple authorised users. It has a standardised or commonly agreed logical information model which is independent of EHR systems. Its primary purpose is the support of continuing, efficient and quality integrated health care and it contains information which is retrospective, concurrent, and prospective.”

Further proposed definitions of an EHR that serve to provide clarification as to its contents, instead provide confusion; specifically, there is conflict in descriptions with regards to the inter-relation between the EMR and EHR and the records’ “manager” or “owner.” When considering various records, it is common to think terms of hierarchy; however, this presents the first problem. For example, Stead et. al. (2005) view the EHR as “a superset of an EMR and totally includes it,” whereas Garets and Davis (2006) consider it “a subset of each care delivery organization s EMR [.]” This discrepancy is more in phrasing, though, as both parties agree that information in an EHR comes from multiple sources “from across the health care system (i.e., from several EMRSs)” and “spans episodes of care across multiple care delivery organizations within a community, region, or state (or in some countries, the entire country)” (Garets and Davis 2006). This potentially life-long record that incorporates a patient's health care details from all institutions stands to serve as comprehensive reflection of the actual patient experience of receiving healthcare (Upham 2004). This understanding of an EHR as “a collection of health information [.]” (Tang et al. 2005), however, breaks down into second source of confusion: the records’ “manager” or “owner.” The EHR has been described to be “owned by the patient” and have “patient input and access” (Garets and Davis 2006), to collect information from [.] “a variety of personal information sources.” (Stead et. al 2005), and to be “managed by an enterprise – typically a doctor’s office, a hospital, or an integrated system” (Tang et al. 2005). It is possible that references to patient input and access refer to the rights and privileges offered by the *Health Insurance Portability and Accountability Act* (HIPAA), but it is not clear.

Items incorporated in an EHR include all provider records of encounters relating to a patient’s past, present and/or future physical and mental health and condition, medical test reports or multimedia images, treatments, medications, clinical guidelines used for the patient's care, and financial and demographic information. And unlike EMR data which is generally captured and stored by one source, EHR data can be captured or transmitted, received or updated, stored or retrieved, securely and in real-time by users at the point of care or distant locations (Upham 2004).

Benefits of the EHR are well understood and “most healthcare professionals agree that if the industry could finally implement a universal EHR, there would be considerable clinical and administrative benefits to be recognized” (Upham 2004). These benefits include: immediate and universal access to the patient record; standardization of care among providers within the organization; reduction of paperwork, documentation errors, filing activities; coding efficiency and efficacy; alerts for medication errors, drug interactions, patient allergies; ability to electronically transmit information to other providers (assessments, history, treatments ordered, prescriptions, etc.); and availability of clinical data for use in quality, risk, utilization, ROI analyses. In this vain, the EHR provides great progress in addressing four of the six IOM aims for healthcare in the 21<sup>st</sup> century: safety, effectiveness, timeliness, and efficiency. The EHR is making inroads and transforming healthcare, but changes must continue in order to address the remaining two IOM aims: patient-centered and equality. These aims and four of the IOM’s ten design rules - care based on continuous healing relationships; customized care according to patient needs and values; patient as the source of control; knowledge is shared and information flows freely – can only be addressed with the use of a personal health record (Tang and Lansky 2005).

***Personal Health Records:*** The National Committee on Vital and Health Statistics (2006) points out that “there is no uniform definition of ‘personal health record’ in industry or government, and the concept continues to evolve.” However, the general consensus is that a personal health record (PHR) is considered to be patient-generated and maintained compilation of

complete and accurate health and medical history, including information such as, symptoms and medication use, information from doctors (e.g., diagnoses and test results), and information from their pharmacies and insurance companies (Connecting for Health 2004; AHIMA 2005). Although there are several methods described below for creating a PHR, it is considered to be electronic by both Connecting for Health (2003) and AHIMA (2005). The purpose of a PHR is so “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” (Connecting for Health 2003). It serves as a lifelong resource of health information needed by individuals to make health decisions” (AHIMA 2005) and “[ ] allows people to access and coordinate their lifelong health information [ ]” (Connecting for Health 2003). It “does not replace the legal record of any provider,” (AHIMA 2005) and “[ ] is not limited to a single organization or a single health care provider.” (Connecting for Health 2003)

The purpose of a PHR is epitomized in the description of an optimal PHR. First, although historically, the term PHR has been applied to both paper-based and computerized systems, optimally the PHR is electronic. It is further defined by the following four characteristics: universally available at anytime, maintained in a secure and private environment, the individual determining rights of access; and provide online health management tools (AHIMA 2005; Tang and Lansky 2005). Rights of access should include the ability of family members and healthcare providers access to portions of a PHR when necessary in either emergency or non-life threatening situations. Additionally, visions for a comprehensive PHR include functionality as a communications hub: to send email to doctors, transfer information to specialists, receive test results, and provide access (Connecting for Health 2004; Tang and Lansky 2005). Optimally, a PHR, created by any means, should also be downloadable to a digital device, such as USB drives, CDs and “smart cards” (Sprague 2005, Tang et al. 2006).

The specific contents in a PHR vary, with the records standards currently still in negotiation, but they usually include information that a consumer normally fills out on a standard new patient questionnaire, such as personal identification, emergency contacts, information for all health care providers, and insurance information. A PHR should also include: immunizations, allergies and adverse drug reactions, medications (including dose and how often taken) including over the counter medications and herbal remedies, illnesses and hospitalizations, surgeries and other procedures, laboratory test results, and family history. Additional information that may be encompassed includes: living wills and advance directives, organ donor authorization, recent physical examination data, provider opinions, tests results, eye and dental records, permission forms, and lifestyle information. Further discussion pf PHR types and access is presented below.

A summary of the EMR, EHR and PHR is presented in Table 1. Information pertaining to how each type is created, who is responsible for record maintenance, and in turn who “own” the data is also presented. These responsibilities are crucial in future discussions of consumer “empowerment,” but are not central to the propositions posited herein.

**Table 1 – Typology of electronic records**

Type	Role in Healthcare	Data Entry and Maintenance by:	Data “Owned” by:
EMR	Record is specific to the EMR system used to collect information. “doctor-centered” record (Lowes 2004)	Health care provider Pharmacy Insurance company	Providing organization May have some patient access for viewing lab results.
EHR	Incorporates information from multiple EMRs. “patient-centered” record (Lowes 2004)	Health care provider Pharmacy Insurance company Labs	Providing organization “Provides interactive patient access” and the ability for patient data entry.
PHR	Patient-generated and maintained compilation of complete and accurate health and medical history (Connecting for Health 2004; AHIMA 2005) for the purpose of health information access, management and sharing.	Patient Caregiver Physician	Patient

## Personal Health Records: Types and Access

PHRs have been described using several terms, e.g. standalone, tethered, interconnected, integrated, and data driven (Tang and Lansky 2005; Tang et. al 2006; Sprague 2006). These various terms serve to clarify the varying complexity in which a PHR can be generated; however, there are really only three main ways to create a PHR (Tang and Lansky 2005), summarized as: independent, personal tools; transaction data-driven; and EHR integrated. Further description for each type is presented below:

**Independent, personal tools:** PHRs that are created using commercially available applications, i.e. “independent, personal tools,” are categorized as is standalone (independent) or web-based. These PHRs are created manually.

**Transaction Data-driven:** a PHR is automatically created using transaction data from sources such as health plans or pharmacies. This type has also been referred to as “tethered” as this type of PHR is maintained and controlled by the health plan, provider organization, or employer; at least 70 million Americans have access to this type of PHR (Sprague 2006).

**EHR Integrated:** a PHR is automatically created by giving the user a view into a health provider’s EHR. This type has also been referred to as “tethered.” (Tang et. al. 2006). Several large organizations, such as the Pal Alto Medical Foundation (PAMF) (Tang et al. 2003) Kaiser Permanente or the Veterans Health Administration (Sprague 2006), provide such access. This last method may also allow additional functionality, such as: secure email messaging, prescription renewal, appointment scheduling, and the ability for the user to add supplemental information (Tang and Lansky 2005; Sprague 2006). This method is seen as producing an “interconnected” PHR.

In general, benefits of PHR adoption include, secure online access, comprehensive personal health history, means to become own health advocate, benchmarks and prompts for maintenance, “health spreadsheet,” fluid provider communication, and automatic data entry (Morrissey 2005). Each method, however, offers numerous unique benefits with various trade-offs, such as high privacy, at the cost of laborious creation and maintenance. These unique combinations inherent to each method, further described below, provide three unique means to create a PHR and serve to address various priorities for consumers as they choose to use PHRs.

**Independent, personal tools:** Offers the highest levels of security and privacy when created on stand alone systems, however they also require the most time to create and do not offer 365/24/7 access at this high security level.

**Transaction Data-driven:** Offers automatic creation, but only contains information that is specific to the entity supplying the information, e.g. an insurance company can only provide information pertaining to office visit date, diagnosis, and cost pertinent to the incorporated providers.

**EHR Integrated:** This is the “holy grail” of PHRs as it is automatically populated with information contained in an EHR, ideally, this means all EHRs that may be associated with a patient. This is rare as EMR systems, the driver for EMRs and in turn EHR, are currently adopted at levels of approximately 25%.

Further information regarding the specific benefits and disadvantages associated with each of the three PHR types, as well as an example, is presented in Table 2.

Enrollment in PHRs is increasing as more Americans gain access to their personal health through four types of providers (AHIMA 2006): employers, insurance companies, healthcare providers, and independent entities - profit and non-profit, such as banks (Baker 2007) or the American Medical Association (<http://www.iHealthRecord.com>). Corporate America has begun to offer PHRs for employees. The recent announcement by Applied Materials Inc., BP America Inc., Pitney Bowes and Walmart Stores Inc. to offer “Dossia” for 2.5 million (Porter 2006) is just one of the latest opportunities. Academic institutions, such as the University of Nebraska (“University Students” 2007) and Washington University in St. Louis (“Online system” 2007), are beginning to drive change by offering PHRs to faculty, staff and students.

While PHRs offer many advantages, they also raise concerns of privacy, confidentiality, standardization, and accuracy (Endsley et al. 2006, IOM 2001; Kim 2004). Additionally, several issues surround the PHR and serve to impede its adoption, including economic and market forces, legal concerns, healthcare consumer understanding and awareness, and necessitated workflow change (Tang et al. 2006). Furthermore, the lofty goal set forth by the IOM for equity, is elusive using this Internet-based system, as currently 74% of adults use the Internet (Harris Interactive 2005). Equity of healthcare delivery use can only happen if all people, regardless of race, ethnicity, socioeconomic status, geographic location, and other factors, have access to the technology infrastructure (IOM 2001).

**Table 2 – PHR types.**

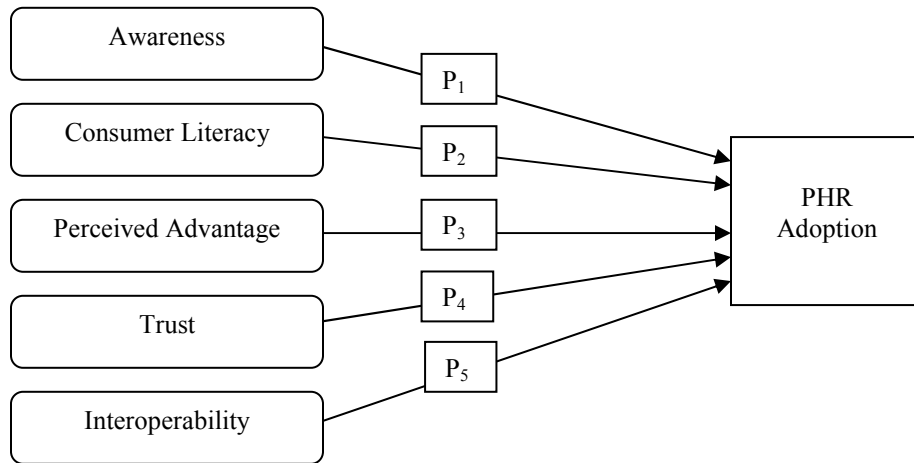
PHR Type	Examples	Benefits	Disadvantages
<b>Independent, personal tools</b>	<a href="http://www.iHealthRecord.com">http://www.iHealthRecord.com</a> ; <a href="http://www.myhealthfolders.com">http://www.myhealthfolders.com</a>	Accessibility. The most accessible means to creating a PHR, second to using paper, is through using an independent application.  Security and privacy: especially if the PHR resides on a personal computer, but it also is the most labor intensive.  Visibility to all tests and records associated with provider(s).	Laborious to create  PC based – no access to others.  Laborious to maintain.  Increased opportunity for data entry error.  Inaccessible globally if created on a stand-alone PC.
<b>Transaction Data-driven</b>	Aetna, Blue Cross,	Low startup effort: Automatically populated with information.	Limited data: Specific to supplier type, such as health claims.
<b>EHR Integrated</b>	Pal Alto Medical Foundation	Low startup effort: Automatically populated with information.  Visibility to all tests and records contained in the EHR.	Rare to find.

Increased access to PHR types, however, does not ensure adoption, a crucial step in the emergence of the National Health Information Network (NHIN). Therefore, we propose herein a basic model for eliciting user priorities in adopting PHRs.

### **Theoretical Background**

Consumers and industry see similar issues with the PHR that must be addressed for successful roll-out. These issues include standards (as it relates to transportability), consumer ability to opt out, privacy and security, family access, and maintenance. Although, these concerns are vital, as the federal government continues to develop a patient-centered National Health Information Network, the adoption of the PHR is more a function of advantage, rather than timing. The question of the consumer’s perspective of this advantage, remains unanswered, but remains central to predictions for adoption.

After reviewing pertinent literature for consumer requested PHR attributes and concerns with use, we propose a basic research model (Figure 1) that depicts antecedents that appear the most salient for PHR adoption: awareness, consumer literacy, perceived advantage, trust, and interoperability. Many of these variables have been cited in technology adoption literature and are pertinent to adoption frameworks including the classic adoption innovation framework (Rogers 1995), expounded upon by Fichman and Kemerer (1997 & 1999). The variables for awareness, perceived advantage, and interoperability in our proposed basic model correlate with variables for perceived use, and perceived ease of use. The variable for trust is used within the organizational behavior literature (Mayer et. al. 1995; McKnight et. al. 1998).



**Figure 1 – Proposed basic research model.**

**Awareness:** In order for individuals to adopt PHRs, they must experience the first stage of the innovation-decision process (Rogers 1995): knowledge. In order to gain knowledge, consumers must be exposed to the existence of PHRs. According to a survey conducted by Health Industry Sights in late 2005 (AHIMA 2006) 83% had never used a PHR; of those respondents, 52% had not heard of a PHR. Employers, insurers, universities, and health care providers are all beginning to make progress in providing consumers with PHRs; we anticipate that as more people are exposed to PHRs, adoption will increase.

**Proposition 1: High PHR Awareness will be positively related to the adoption of PHRs.**

**Consumer Health Literacy:** Health literacy is “the ability to understand and act on health information” (McCray 2004). This implies that before a consumer can adequately make decisions about their health care, and consequently consider using a PHR, they must be able to obtain, process, and understand at least basic levels of health education. Similar to other technologies, understanding brings more adoption and usage. Navigating the medical maze and the jargon may prevent usage of PHRs even if access is available. Tang et al. (2006) suggests that adult PHR-related education could be provided when an illness occurs or there is concern for illness in another, as this is often a teachable time. This assumes that the healthcare provider is open to providing this service. Initiatives are ongoing to increase the public’s health literacy scores. In the meantime, there are percentages of the population with adequate scores; we anticipate that those individuals with higher health literacy scores will adopt PHRs at higher rates.

**Proposition 2: High Health Literacy will be positively related to the adoption of PHRs.**

**Perceived Advantage:** According to Harris Interactive (2005) currently 74% of adults use the Internet, providing a vast majority of Americans with access to web based PHRs. Additionally, record access is becoming available via cellphone, IPODS, and banks. As access to PHRs is made readily available, we anticipate increased levels in adoption rates. Patients who believe that PHRs offer an advantage over the current medical records system for maintaining health will be the first adopters (Rogers 1995). These individuals may be people with chronic conditions, taking multiple medications; caregivers; or those with children. Additionally, PHRs offer advantages for persons living in areas prone to natural disasters or those who travel so must be considered. Incidents like Hurricane Katrina in 2005 that displaced over 400,000 people and destroying access to medical records serve to warn consumers; future predicted high hurricane activity levels will further encourage use of a PHR as part of an individual’s emergency preparedness. Therefore, we anticipate those individuals with greater perceptions of a PHR advantage will adopt at increased rates. This variable is interesting, as it is further predicted that when consumers begin to perceive the need and demand the convenience of electronic records, they will put pressure on the providers to adopt compatible technology (Sprague 2006).

**Proposition 3: High Perceived Advantage will be positively related to the adoption of PHRs.**

**Trust:** The major concerns for consumers when considering PHRs are privacy and security. In light of recent media coverage of a lost laptop containing millions of medical records, and widespread reports of identity fraud, consumers guard their information. They are willing to share the data, however; in a 2003 survey conducted by Markle Foundation, over half of the respondents would most trust “doctor’s to keep online medical records private and secure; insurers were trusted over the government or a third-party vendor (Sprague 2006). Current levels of personal record maintenance are below 50%; however, nearly 85% of the remaining half believes keeping records is a good idea (Harris Poll 2004). Obviously, there is interest in creating a PHR; we anticipate that individuals offered choices by trusted entities will more likely adopt PHRs.



**Proposition 4: High Supplier Trust will be positively related to the adoption of PHRs.**

**Interoperability:** As interoperability is related to compatibility and complexity (Rogers 1995), it serves as a significant barrier to using a PHR, especially in terms of time that may be required during an initial setup. The more time a consumer must spend entering data, the less likely they will be to fully utilize or maintain it. In order to reduce the amount of time the consumer will spend, and further to minimize the potential for data entry error, PHRs should be integrated with EHRs. We anticipate that those individuals offered PHRs which are integrated with EHRs will adopt PHR at higher rates.

**Proposition 5: High Interoperability will be positively related to the adoption of PHRs.**

## Methodology

We propose to survey users and non-users of electronic medical records within a major university health center. The university has recently adopted an electronic medical records system and is investigating the introduction of personal health records for users. Our survey will ask potential users about the likelihood of adoption of PHRs. Specifically, we will survey students about their PHR awareness and their health literacy level, their trust of the system, the perceived advantage of the system and their views on the sharing of information (interoperability between the PHR and the University's EMRs). The current medical center handles more than 70000 visits per year. The survey will be pilot tested this summer and a full survey will be conducted this fall. Survey development is ongoing.

## Discussion

The PHR is integral to the success of the emerging National Health Information Network (NHIN) and is perceived to serve to support the effort to give all Americans access to electronic health records by 2014. The plan for roll-out appears to be that if enough individuals begin to demand access and use of the PHR, doctors will be forced to adopt EMR systems at greater rates in order to create EMRs which feed EHRs, which will be used to create integrated PHRs. A benefit of this process and increased EMRS adoption is that systems are then in place to drive formation and operation of regional health information organizations, which in turn drives the state and federal health information networks. This process accents the need and urgency behind PHR adoption.

Currently, the plan to foster PHR adoption appears as a "if we build it, they will come" model. PHRs have been built, with input from government, business leaders, health care providers, health insurance companies, and consumers. Access to PHRs is increasing via employers, insurance companies, healthcare providers, and independent entities. However, studies that elicit means to ensure adoption are rare, therefore the future for successful implementation of the PHR is unclear.

The basic research model proposed herein offers a means to determine a consumer's priorities for using a PHR. Five variables - awareness, consumer literacy, perceived advantage, trust, and interoperability - were proposed, however, there are several which also warrant discussion, e.g. age, gender, health need, voluntariness, social influence, and environmental influence. The relationships proposed are linear, but it is conceivable that interaction exists and that some variables may serve as moderators or mediators, e.g. a patient may be highly aware of PHRs and have the skills and knowledge to create a PHR, but they may not be likely to adopt if they do not trust the PHR provider or its means of storage.

The vision for a PHR is for it to be electronic and integrated with EHRs. However, given concerns of privacy and security, it is possible that this type of PHR may not fair well during early adoption. As such future research should extend to the three types of PHRs: independent, personal tools; transaction data-driven; and EHR integrated. Additionally, as PHR adoption increases, further studies should include:

- The idea of patient's ownership of the PHR and the effects on PHR data currency and accuracy.
- Effect of the PHR on quantity and quality of patient's visits with their healthcare provider.
- Effect of the PHR on specific health outcomes.
- Effect of a patient's health literacy and use of PHR and their health seeking behaviors.

**Conclusions:** This paper offers a proposal to elicit the consumer's priorities for PHR adoption. The ability to create a PHR is available. The desire and need for consumer's to utilize this technology is real. The intangible question of "Will they come?" has yet to be answered.

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