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Virtualized healthcare delivery: Understanding users and their usage patterns of online medical consultations

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ABSTRACT

Background: Virtualization of healthcare delivery via patient portals has facilitated the increasing interest in online medical consultations due to its benefits such as improved convenience and flexibility, lower cost, and time savings. Despite this growing interest, adoption by both consumers and providers has been slow, and little is known about users and their usage and adoption patterns.

Objective: To learn characteristics of online healthcare consumers and understand their patterns of adoption and usage of online clinical consultation services (or eVisits delivered via the portal) such as adoption time for portal users, whether adoption hazard changes over time, and what factors influence patients to become early/late adopters.

Methods: Using online medical consultation records between April 1, 2009 and May 31, 2010 from four ambulatory practices affiliated with a major healthcare provider, we conduct simple descriptive analysis to understand the users of online clinical consults and their usage patterns. Multilevel Logit regression is employed to measure the effect of patient and primary care provider characteristics on the likelihood of eVisit adoption by the patient, and survival analysis and Ordered Logit regression are applied to study eVisit adoption patterns that delineate elements describing early or late adopters.

Results: On average, eVisit adopters are younger and predominantly female. Their primary care providers participate in the eVisit service, highlighting the importance of physician's role in encouraging patients to utilize the service. Patients who are familiar with the patient portal are more likely to use the service, as are patients with more complex health issues. Younger and female patients have higher adoption hazard, but gender does not affect the decision of adopting early vs. late. These adopters also access the patient portal more frequently before adoption, indicating that they are potentially more involved in managing their health. The majority of eVisits are submitted during business hours, with female physicians responding faster (from submission to reply), on average.

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Conclusions: This study addresses virtualization of primary care delivery via patient portals and online clinical consultations and examines factors that distinguish eVisit adopters from patient portal users. Among many delineating characteristics, it is particularly significant that familiarity with the patient portal service and participation of primary care provider are found to be key elements that motivate patients to become an eVisit user and early/late adopter. These findings can be used by provider organizations to design and implement strategies to improve uptake of online medical consultations to complement traditional office visits. Offering such alternative channels of care delivery may potentially improve access, efficiency and outcomes for both patients and providers alike.

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1. Introduction

Healthcare is the largest service sector in many economies worldwide, but it lags behind other industries in the use of efficient and innovative approaches to both patient care and service organization [1–3]. Thus, innovative, disruptive models of virtualized health care delivery that leverage current information, communication and decision technologies in novel ways have the potential to change the practice of healthcare delivery and management and improve outcomes [4]. To satisfy the growing demand for medical care, several new models are currently being developed and piloted, such as online medical consultations, which do not rely on face-to-face visits as the sole model of care delivery [5]. Alongside, the current patient-centered-care imperative has also resulted in the use of portal technologies [6], among others, to inform, engage and empower the patient in shared decision making [7].

Thus, there is growing interest in online medical consultation, especially asynchronous online consultation, due to its benefits such as convenience, cost, flexibility and time savings [1,8]. There are two types of virtual encounters: synchronous (e.g. video conference) and asynchronous (message, email, etc.). The latter type provides more versatility as it does not restrict all the parties involved to connect to the consultation service and participate in the exchange at the same time. In this paper, online medical consultation refers to the asynchronous type of communication. To receive online medical consultation service, or eVisit, no appointment scheduling is required since patients initiate patient–physician interaction asynchronously. Patients can submit their health concerns at home/work using Internet technology enabled applications at potentially lower cost. Many healthcare organizations are setting a new service delivery strategy that empowers patients to access their clinical information and interact with their healthcare provider [9]. Patient Internet portals, for example, are widely available [10], and adopted by 40% of U.S. hospitals [11]. They enable users to activate self-service healthcare management electronically, such as checking their own medical records, researching related health issues, making/changing appointments, requesting prescription renewals, and interacting with clinicians with minimal disruption [5,12]. Online communication between patients and physicians that provide medical consultation for non-urgent health conditions can potentially support management of chronic health

conditions by providing the tools to enter data such as blood glucose levels, weight, and blood pressure, and resources needed to monitor and control their health conditions over time [5,13–15]. Thus patients have an improved ability to actively participate in their health care to achieve more favorable health outcomes [11,12,16].

Patient eVisits are gaining momentum due to increasing consumer demand for improved access to clinical services, availability of new technologies to deploy such services and development of reimbursement initiatives by major payers [13–15,17]. The eVisit service provides patients with access to a series of structured, secure message exchanges with a physician using portal technology, providing an alternative for onsite office visits and non-reimbursed phone-based care [13]. This can potentially increase the volume of patient access to healthcare providers [5,13,14]. Surveys indicate that online communication with healthcare provider is the most preferred service for patients with Internet access [18]. They have been shown to prevent an office visit for about 40% of the patients who signed up for the service [14], and the availability of this service decreased spending on the clinic visit [19]. Despite increasing interest in online health consultations by consumers, adoption has been slow and little is known about the users of such services other than that they are more educated and have higher household income compared to non-users [15,19]. A national survey of health IT use among 18–64 year old consumers confirmed that despite wide interest in accessing health information, women are overwhelmingly more likely than men to look up online health information, request prescription refills, seek medical advice and other interactions with their health provider [20]. As portals and eVisits become more widely available to patients and more increasingly sought, it is important to understand the key characteristics of actual consumers of online health consultations in contrast to survey respondents, in order to design appropriate services and deliver the most effective experiences for providers and patients alike.

In this study, we address this question by analyzing the deployment of eVisits within a patient portal environment at four primary care clinics associated with a major health system in Western Pennsylvania. We examine the key demographic and usage characteristics of consumers accessing the portal and eVisit service from April, 2009 to May, 2010. Using data that includes eVisit records, patient demographics,

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