


# Promoting Patient-Centered Preventive Care Using a Wellness Portal: Preliminary Findings

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## Abstract

Optimal delivery of preventive services requires appropriate information processing and patient involvement. However, information is limited in preventive service delivery that integrates health information technology (HIT). This study aimed to develop and pilot test an Internet-based wellness portal to facilitate patient-centered care. Guiding portal development, an advisory panel systematically identified portal elements/features and engaged in the Delphi technique to achieve consensus on portal structure. To pilot test the portal, 30 patients were randomly recruited from 2 practices to complete a questionnaire. Frequency statistics were compiled for structured questions, and content analyses were conducted to examine qualitative responses on portal utility. Participant age ranged from 23 to 83 years (mean, 41 years). About 78% were female, 22% were ethnic minorities, and 80% had some college education. The portal provides a personalized wellness plan for preventive services based on patient demographics, medical history, risk factors, medications, laboratory tests, and functions like symptoms tracking, access to education materials, and secure patient-practice communication. Patients rated the portal in ease of use, importance, and utility/value. Over 90% found the portal easy to use in terms of navigation, finding information, comprehension, and instructions. Patients regarded the portal as an important tool in achieving wellness, improving patient-practice interactions, and a valuable resource. Contents analyses showed that patients found the portal helpful, particularly its reminder and tracking functions. Patients with basic computer literacy may use a simple, consumer-oriented Web site to manage their preventive care. The portal exemplifies how HIT may encourage active patient participation in their care and potentially improve health outcomes.

## Keywords

patient-centered care, prevention, primary care, health information technology, wellness

## Introduction

The Institute of Medicine (IOM) defines patient-centeredness as “providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions.”<sup>1</sup> Patient-centeredness has become important in primary care as most individuals seek care in this setting and significant population-wide impact may be achieved by improving preventive care and promoting wellness.<sup>2</sup> On the other hand, given the wide spectrum of healing activities in primary care settings that range from primary prevention through chronic disease management to psychosocial support, providing patient-centered care may prove particularly challenging. Moreover, a number of preventive strategies must be individually tailored based on demographics and personal risk factors and modified according to patient preferences and goals.

One strategy to promote meaningful patient-practice interactions that are central in patient-centered care is the

use of health information technology (HIT). The IOM report delineated opportunities to use HIT to achieve patient-centeredness by providing “access to clinical knowledge through understandable and reliable Web sites and online support groups;<sup>3</sup> customized health education and disease management messages<sup>4</sup>; and decision support systems to tailor information according to an individual patient’s characteristics, genetic makeup, and specific conditions.”<sup>5</sup>

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In the context of current health care reform proposals, HIT will become more integrated into care delivery. Over the past decade, an increasing number of HIT applications have incorporated Web-based portals that provide patients electronic access to their personal health records (PHRs), deliver educational content, and offer other functions, including secure messaging, appointment management, prescription refills, billing, and so on.<sup>6</sup> Some recent studies have suggested that patient portals have a positive impact on components of patient-centered care, facilitating information flow and patient education with improved patient-clinician communication,<sup>7,8</sup> enhancing patient experience with the process of care,<sup>9-12</sup> and improving overall quality of care.<sup>13-16</sup> Notwithstanding a growing body of literature on patient portals, there is virtually no information on portals that specifically focus on preventive services in the context of patient-centered care.<sup>2,17</sup>

To bridge these gaps in the current knowledge base and identify an HIT strategy that promotes patient-centered care, our study objectives were to (1) develop a wellness portal for patients in primary care settings, and (2) conduct a field test of the portal in primary care practices. Preliminary findings from the field test would inform efforts to improve and refine the portal and its integration into comprehensive care delivery.

## Methods

The study was conducted within the Oklahoma Physicians Resource/Research Network (OKPRN), a practice-based research network of over 240 allopathic and osteopathic primary care clinicians in 94 practices throughout Oklahoma. OKPRN provides care for approximately 350,000 patients, about 10% of the state's population. The network includes clinics ranging from large, urban academic practices to small, rural private practices.

### Portal Development

We assembled an advisory committee and tasked it to identify features and structure of a wellness portal that would be the most generalizable. The committee consisted of 3 OKPRN clinicians representing academic, private, and community practices who have HIT experience, nurses or medical assistants, 2 adult caretakers of pediatric patients, and 2 adult patients over the age of 50 years with ongoing medical conditions.

The committee met 3 times to discuss the portal design. Clinician and patient input were systematically catalogued, and a list of elements recommended for portal inclusion was compiled. The Delphi technique was applied to achieve consensus on the final portal structure. On a 5-point Likert scale, members of the advisory committee ranked each

element using the following criteria: (1) ease of use, (2) ease of understanding, (3) optimal structure and content, (4) relevance to patients, (5) appropriateness and usefulness of information, (6) value of the service, and (7) potential impact. The development of the portal prototype was completed in 5 months.

### Field Test

We conducted a field test to refine the integrated portal over a 6-month period in 2 OKPRN practices. Using a list generated from practice billing records, we identified 64 patients who were seen in the clinics during the previous 3 months. A screener questionnaire was administered to apply our exclusion criteria (eg, language, computer access, and technical ability). The final sample included 30 patients.

Practice staff provided demographic information for each patient, including gender, date of birth, and race/ethnicity. Enrolled patients were given access to the portal for 6 months. To assess user experience, patients were surveyed via both structured and open-ended questionnaires. The structured survey contained 14 questions with responses based on a 4-point Likert scale (1 = strongly disagree; 4 = strongly agree). Questions addressed the ease of use, patient perceptions of portal importance and usefulness, and potential impact. Open-ended questions were used to capture information on the overall quality of the portal and suggestions for improvement.

We used a mixed-methods approach to evaluate data generated from the field test. Frequency statistics were compiled for all structured questions using SAS v.9.1 (SAS Institute, Cary, North Carolina). Content analyses, using Atlas.ti v.5.2 (Scientific Software, Berlin, Germany), were conducted on the open-ended questions to describe portal features that were barriers or facilitators to improving care and recommendations for further improvement.

## Results

Based on the Delphi rankings, the portal prototype includes the following features: patient demographic information, past preventive services, personal risk factors (eg, allergies, adverse reactions, chronic conditions, and clinical/behavioral factors), symptoms tracking, health education materials, medication lists, linkage to childhood vaccination records, secure messaging with practices, appointment tracking and documentation of visits, screening and laboratory tests, and personal care preferences (Figure 1). The above parameters are fed into a recommendation algorithm that delivers a set of evidence-based (United States Preventive Services Task Force) preventive service recommendations tailored to individual patients. Features such as daily tracking of blood pressure, glucose, lipid values, weight,



Figure 1. The main menu of the Wellness Portal.

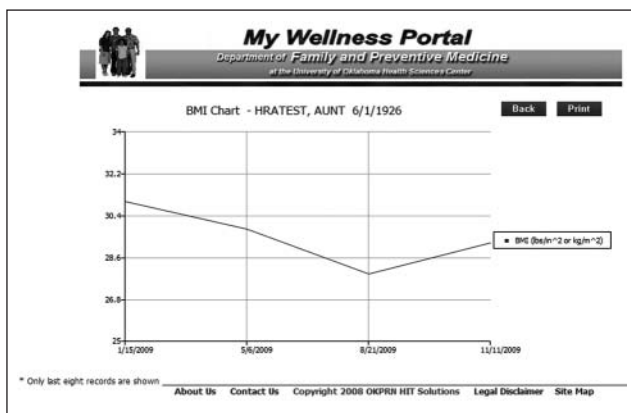


Figure 2. Visualization of trends in intermediate health outcomes tracked by patient.

and body mass index calculation can be used to record and visualize trends in graphical form over time (Figure 2).

The field test participants had an age range of 23 to 83 years (mean, 41 years). The sample included 78% female patients, 82% with some college education, and 22.2% ethnic minorities, where 18.5% were African Americans and 3.7% were Native Americans. Table 1 presents the frequency statistics of patient ratings on the ease of use, perceived importance and value, and perceived impact of the portal. The majority of the patients found the portal easy to use in terms of navigation (93.3%), finding information (90.0%), comprehension (93.3%), and instructions (93.3%). However, only 76.7% considered the information on the portal to be arranged well. Between 60% to 86.7% of the patients regarded the portal as a valuable resource (83.3%), providing important information (86.7%), improving patient-provider interactions (60.0%), and serving as a tool to facilitate participation in one's own care (80.0%) and decision making (73.3%). In assessing overall impact, patients reported that the information on the portal is what a

person needs for wellness management (80.0%) and helpful for improving health (73.3%). Overall, the portal is helpful to improve individual health (60.0%), and 70% believed the portal will help them maintain health and well-being.

Contents analyses showed that patients found the portal in general as a helpful tool. One patient noted:

“Since beginning to use the Wellness Portal, my health has greatly improved. I’ve lost weight, my blood pressure has dropped, I’ve increased my activity level, and I feel and look so much better. Perhaps these positive attributes come simply from being more conscious of my health, but nevertheless, I’m thrilled.”

In identifying the most useful features of the portal, a number of patients indicated the reminder and tracking functions to be particularly helpful:

“I think the health history is a valuable tool. It’s nice to be able to see when my last pap smear occurred or when my immunizations were received or are due again. It’s easy to access and very convenient.”

On the other hand, some patients expressed concerns about record maintenance and the utility of the portal during the actual office visit:

“I am not quite sure who maintains the information. If someone else does it, I don’t trust it 100%, and if I am to maintain it, I don’t think it is something I would put on the computer. I would continue using my notebook that I can take to doctor appointments and hospital visits.”

## Discussion

The field test provided valuable preliminary information to refine the portal design and structure as well as facilitate portal use. Our findings showed that patients regarded the Wellness Portal as an easy to use, important, and valuable tool that helped them manage their own health. With some fine-tuning of the portal structure, we predict an increase in patient satisfaction. For example, one of the priorities is to establish direct patient messaging with practices via the portal, which should improve patient satisfaction with communication.

While patients in our study saw value in the portal, clinicians in general have been reluctant to adopt this technology, based on perceptions such as the lack of computer or Web access, potential burden from excessive messages, and data security. However, several recent studies on HIT have showed a high proportion of the population with Web access

**Table 1.** Frequency Statistics of Responses on Portal Utility

	N (n = 30)	Percentage (%)
<b>Ease of use</b>		
It is easy to navigate the portal.	28	93.3
It is easy to find information on the portal.	27	90.0
It is easy to understand information presented on the portal.	28	93.3
It is easy to understand instructions to manage one's health information.	28	93.3
Information on the portal is arranged well.	23	76.7
<b>Patient perception of importance and usefulness</b>		
Information on the portal is important.	26	86.7
Portal is a valuable resource.	25	83.3
Portal improves interactions with providers.	18	60.0
Information on the portal is helpful for one to participate in one's own care.	24	80.0
Information on the portal is what is needed to make more informed decisions.	22	73.3
<b>Perception of potential impact</b>		
Information on the portal is what a person needs to manage his/her wellness.	24	80.0
Information on the portal is helpful to improve one's health.	22	73.3
Portal is helpful to improve one's health.	18	60.0
Portal will likely help to continue improve health and well-being.	21	70.0

The 4-point Likert scale responses (1 = disagree strongly, 2 = disagree, 3 = agree, 4 = agree strongly) were dichotomized into 2 groups: agree (responses of 3 or 4) and disagree (responses of 1 or 2).

(73%),<sup>18</sup> and 80% of those reported using the Web to find health information.<sup>19</sup> When secure electronic messaging is available, clinicians typically receive 10 messages per day from approximately 2500 patients, which corresponds to an average patient base. Patients also show respect for clinicians' time by not abusing their electronic access.<sup>8</sup> Most patients were not concerned with potential privacy breaches and reported that having access to their records gave them security and a sense of ownership and control of their health.<sup>7,11</sup> Furthermore, portal use may be cost-effective to payers, where a number of organizations have successfully developed reimbursement schemes for electronic clinician-patient communication.<sup>8,20,21</sup>

Like all research, our study has limitations that should be noted. As is the nature of pilot studies, the small sample size did not permit us to conduct more detailed statistical tests to examine associations. In addition, the short duration of the study hindered the collection of health outcome or cost information. A randomized controlled trial is currently in progress to observe the impact of the portal on preventive services utilization and intermediate health outcomes. Nevertheless, our study contributes to the current knowledge base by identifying portal elements through a consensus process specifically designed to make the portal patient centered and generalizable in primary care settings.

Given the advances in HIT, the IOM postulates that optimal delivery of preventive services will increasingly require sophisticated information processing and greater patient involvement. Patients with basic computer literacy may use

a simple, consumer-oriented Web site to coordinate their own preventive care. The portal exemplifies HIT's role in promoting active patient participation in their own care and potentially improving health outcomes.

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### Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the authorship and/or publication of this article.

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### References

1. Institute of Medicine. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academy Press; 2007.
2. Wright JC, Weinstein MC. Gains in life expectancy from medical interventions: standardizing data on outcomes. *N Engl J Med*. 1998;339(6):380-386.
3. Mittman R, Cain M. The future of the Internet in healthcare: a five-year forecast. *Hosp Q*. 2000;3(4):63-65.
4. Goldsmith DM, Safran C. Using the Web to reduce postoperative pain following ambulatory surgery. *Proc AMIA Symp*. 1999:780-784.

5. Garibaldi RA. Computers and the quality of care: a clinician's perspective. *N Engl J Med*. 1998;338(4):259-260.
6. Schwartz KL, Roe T, Northrup J, Meza J, Seifeldin R, Neale AV. Family medicine patients' use of the Internet for health information: a MetroNet study. *J Am Board Fam Med*. 2006;19(1):39-45.
7. Wainstein BK, Sterling-Levis K, Baker SA, Taitz J, Brydon M. Use of the Internet by parents of paediatric patients. *J Paediatr Child Health*. 2006;42(9):528-532.
8. Lin CT, Wittevrongel L, Moore L, Beaty BL, Ross SE. An Internet-based patient-provider communication system: randomized controlled trial. *J Med Internet Res*. 2005;7(4):e47.
9. Ralston JD, Revere D, Robins LS, Goldberg HI. Patients' experience with a diabetes support programme based on an interactive electronic medical record: qualitative study. *Br Med J*. 2004;328(7449):1159.
10. Delenardo C. Web-based tools steer patient-focused care. *Nurs Manage*. 2004;35(12):60-64.
11. Winkelman WJ, Leonard KJ, Rossos PG. Patient-perceived usefulness of online electronic medical records: employing grounded theory in the development of information and communication technologies for use by patients living with chronic illness. *J Am Med Inform Assoc*. 2005;12(3):306-314.
12. Hassol A, Walker JM, Kidder D, et al. Patient experiences and attitudes about access to a patient electronic health care record and linked Web messaging. *J Am Med Inform Assoc*. 2004;11(6):505-513.
13. McMahon GT, Gomes HE, Hickson Hohne S, Hu TM, Levine BA, Conlin PR. Web-based care management in patients with poorly controlled diabetes. *Diabetes Care*. 2005;28(7):1624-1629.
14. Tate DF, Jackvony EH, Wing RR. Effects of Internet behavioral counseling on weight loss in adults at risk for type 2 diabetes: a randomized trial. *JAMA*. 2003;289(14):1833-1836.
15. Lenert L, Munoz RF, Stoddard J, et al. Design and pilot evaluation of an Internet smoking cessation program. *J Am Med Inform Assoc*. 2003;10(1):16-20.
16. Kwon HS, Cho JH, Kim HS, et al. Establishment of blood glucose monitoring system using the Internet. *Diabetes Care*. 2004;27(2):478-483.
17. Gellert GA. US health care reform and the economy of prevention. *Arch Fam Med*. 1993;2(5):563-567.
18. Harris Interactive I. Number of "Cyberchondriacs"—U.S. Adults Who Go Online for Health Information—Increases to Estimated 117 Million. Rochester, New York: Harris Interactive; 2005.
19. Pew Internet and American Life Project H. *Online Health Search 2006*. Washington, DC: Pew Internet & American Life Project; 2006.
20. Weingart SN, Rind D, Tofias Z, Sands DZ. Who uses the patient Internet portal? The PatientSite experience. *J Am Med Inform Assoc*. 2006;13(1):91-95.
21. Kaiser Permanente Patient Portal. Available at: <http://members.kaiserpermanente.org/kpweb/membershome/entrypage.do>. Accessed February 9, 2007.

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