

Computer-using patients want Internet services from family physicians

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KEY POINTS FOR CLINICIANS

- Computer-using patients desire Web-based services to augment their care.
- Practice Web sites should be designed to go beyond information alone and incorporate services such as online appointments.
- Physicians should consider providing “virtual visits” to assist with disease management.

Patients are increasingly using the Internet to obtain medical information. Few practice Web sites provide services beyond information about the clinic and common medical diseases. We surveyed computer-using patients at 4 family medicine clinics in Denver, Colorado, by assessing their desire for Internet services from their providers. Patients were especially interested in getting e-mail reminders about appointments, online booking of appointments in real time, and receiving updates about new advances in treatment. Patients were also interested in virtual visits for simple and chronic medical problems and for following chronic conditions through virtual means. We concluded that computer-using patients desire Internet services to augment their medical care. As growth and communication via the Internet continue, primary care physicians should move more aggressively toward adding services to their practices' Internet Web sites beyond the simple provision of information.

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Patients are increasingly using the Internet to obtain medical information. A recent Harris poll estimated that 98 million Americans have retrieved health-related information online, an increase of 44 million since 1998.¹ Previous studies examined patients' subjective ratings² of medical information sites and assessed the quality of medical information available through the World Wide Web.³ However, very little research has been published regarding patients' interest in “e-health” services.^{4,5} The health care industry lags far

behind other industries in terms of providing useful Internet services for the consumer.

We hypothesized that computer-using patients were interested in using the current and potential future services of Web-based technology to augment their care through clinic-based Web sites. The purpose of this study was to specifically determine the interests and needs of computer-using patients in clinic Web services beyond informational services alone.

METHODS

An anonymous survey was given to a convenience sample of patients from 4 Denver Family Medicine clinics, with each surveying anywhere from 40 to 110 patients. The clinical sites used in this survey were socioeconomically diverse and included 1 community-based residency clinic, 1 university-based residency clinic, and 2 health maintenance organization clinics. A total of 600 surveys were distributed. Patient surveys were placed at the front desk, where the personnel were requested to ask patients to complete this volunteer survey. Computer and noncomputer users were asked to take the survey and their computer-using status was noted on the survey. Surveys were completed during the visit and returned to the front desk for collection. The surveys represented visits in these clinics from July 2000 to November 2000. This anonymous survey assessed patient demographics, Internet use, and patients' interest in Internet services. Preferences for 22 Internet services were assessed on a Likert scale of 1 (definitely would not use) to 10 (definitely would use).

Data were analyzed using SPSS version 10 for Windows (SPSS Inc., Chicago, IL). Only computer users were included in the final calculations because of the very small percentage of noncomputer users (7.4%) who volunteered to take the survey. Frequencies were used to describe the computer-using survey respondents, their use of computers, and their preferences for Web-based services. Tests

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were used to evaluate significant variations among the survey respondents.

RESULTS

Of 600 surveys, 227 were returned (37.8%). Most respondents were female (66.3%) with a mean age of 44.7 years. The vast majority of those who responded to this survey owned computers at home (90.0%) and/or had them at work (83.7%); 44.5% were college graduates and 52.1% had chronic medical conditions. Data on patients' current use of the Internet are shown in Table 1.

Patient's desires for Web-based services are summarized in Table 2. Patients displayed a strong interest in front desk services such as being able to book appointments in real time (mean Likert score, 8.50) over the Internet and getting e-mail reminders about appointments (mean Likert score, 8.61). Back office services ranking high included requesting medication refills online (mean Likert score, 8.47) to requesting a referral (mean Likert score, 8.26). The ability to send a message to "your doctor" also ranked high (mean Likert score, 8.40). There was relatively little interest in taking a virtual tour of the clinic (mean Likert score, 6.26) or having a page of links to health insurance company Web sites (mean Likert score, 6.73).

Patients displayed moderate interest in virtual visits (a patient-to-physician encounter conducted using the Internet alone), with 66.0% showing interest in a virtual visit for a simple medical problem. A slightly lower percentage (57.7%) was interested in a virtual visit for a chronic medical problem. Approximately a third of patients (32.6%) was more interested in a real-time virtual visit that used a personal computer (PC) videoconference rather than a real-time e-mail conversation (ie, "chat room" or one-on-one "chat"). Not surprisingly, a larger percentage of patients was more willing to make a virtual visit if it offered a lower co-payment (62%). Only 46.7% of patients indicated they would be interested in a virtual visit if it required the usual co-payment.

Interest in virtual visits for simple medical problems was higher among patients who had previously used the Internet to order products online (74.6% vs 45.0%, $P < .001$). Patients with chronic diseases were more likely to be interested in virtual visits for simple medical problems (70.8% vs 62.2%, $P = .213$), although this association was not

TABLE 1

Internet use among computer-using patients

Type of use	%
Internet used at least once	93.8
E-mail used as a means of communication	90.0
Hours of Internet use each week	
0-4	38.4
5-8	25.8
9-12	18.2
13-16	3.0
>16	14.6
Have used the Internet to order online	69.2
Have used the Internet to pay bills online	19.1
Have used the Internet to obtain medical information	58.4

TABLE 2

Internet services desired by computer-using patients

Service	Mean Likert score*
Receive e-mail reminders about appointments	8.61
Receive updates about advances in treatment	8.56
Make an appointment online with immediate confirmation	8.50
Obtain prescription refills	8.47
Send a message to your doctor	8.40
Look at your medical records through a secure site	8.32
Obtain a referral	8.26
Receive e-mail reminders about upcoming health services	8.22
Receive e-mail reminders about upcoming clinic services	8.14
View immunization records	8.04
Complete registration/reason for visit online	8.00
Send updates on health/condition to your doctor	7.97
Communicate with provider regularly about chronic disease	7.90
Send requests for medical record release	7.88
Send feedback/suggestions to clinic	7.83
Obtain recommendations on good patient education sites	7.48
Request an appointment by e-mail, receive response within 24 h	7.46
Send a message to billing	7.45
Obtain specific directions and map to clinic	6.75
Use a computer in the clinic waiting room for medical information	6.74
Obtain links to health insurance company Web sites	6.73
Take a virtual tour of the clinic or hospital	6.26

*Likert scale: from 1 (least important) to 10 (most important).

statistically significant. A higher education level was associated with obtaining medical information over the Internet. College graduates were more likely than nongraduates to have used the Internet to obtain medical information (50% vs 33.6%, $P < .05$).

DISCUSSION

Patients who used computers and the Internet showed significant interest in using Web-based services from their family physicians. These patients were especially interested in using the Internet for front desk services and common tasks, which are frequently provided over a busy telephone line. Services related to providing information were of less interest, and patients displayed only moderate interest in virtual visits. Using PC videoconferencing instead of e-mail communication would increase patients' interest in a virtual visit. Poor videoconferencing capability over PCs, lack of access, or perhaps a fear of insufficient security over Web-based communications might limit interest.⁶⁻⁸

The survey had several limitations. As noted, only 7.4% of noncomputer users took the survey when requested by front desk staff. Therefore, we limited our analysis to computer-using patients. However, given the current statistics of Internet use and growth in access to all sectors of our population, it is likely that most practices will find a sufficient percentage of "connected" patients to apply the study's findings. Assessment of online use at a specific clinic site will be useful in prioritizing the need and application of Internet services. The low response rate of our survey is likely due to the voluntary nature of the survey and the challenge of the front desk staff in finding time to encourage patients to take the survey. The practices that participated were busy ones that must move patients in a timely fashion from the front desk area to examination rooms.

Businesses with many employees who use e-commerce and banking services may especially benefit from signing up with a practice that offers online services. Patients with chronic diseases usually require more frequent visits with their physicians. We hope that patients with chronic disease will take advantage of "virtual visits" as they become available, thereby freeing them from transportation costs, lost time, and productivity.

Other desired services such as online appointment scheduling, medication refills, and referral requests might improve the efficiency in front and back office functions by reducing the number of lengthy tele-

phone calls. We hope to perform future studies that evaluate the impact of Internet services on efficiency and patient/provider satisfaction.

Physicians should place a high priority on building service components into their practice Web sites. Interfacing these Web-based services with electronic medical records is another important task that needs further programmer development and attention by physicians. We hope that continued research in e-health care will further catalyze technologic developments that improve disease management, increase practice efficiency and patient satisfaction, and reduce medical errors.

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