

Experiences of Patients Who Were Early Adopters of Electronic Communication With Their Physician: Satisfaction, Benefits, and Concerns

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Objective: To explore the experiences of patients who were early adopters of e-mail communication with their physicians.

Methods: Patients' experiences were assessed with an Internet-based survey of 1881 individuals and in-depth telephone follow-up interviews with 56 individuals who used e-mail to communicate with providers. Two investigators qualitatively coded interview comments independently, with differences adjudicated by group consensus.

Results: A total of 311 (16.5%) of the 1881 individuals reported using electronic mail to communicate with their physicians. Compared with the population-based Behavioral Risk Factor Surveillance Survey, users of e-mail with physicians were twice as likely to have a college education, were younger, were less frequently ethnic minorities, and more frequently reported fair/poor health. Among the 311 patients who used e-mail with their physicians, the most frequent topics were results of laboratory testing and prescription renewals. However, many of the 311 users (21%) also reported using asynchronous e-mail inappropriately to convey urgent or sensitive issues (suicidality, chest pain, etc). Almost all (95%) perceived that e-mail was more efficient than the telephone. Important benefits uncovered from the interviews were that some patients felt more emboldened to ask questions in e-mail compared with face-to-face communication with doctors, and liked the ability to save the e-mail messages. Users also expressed concerns about privacy.

Conclusion: Patients that use electronic communication with their physicians find the communication efficient for disease management. Further patient education about inappropriate use of e-mail for urgent issues is needed.

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health outcomes.¹³⁻¹⁶ The recent report of the Institute of Medicine, *Crossing the Quality Chasm*, states that "patients should receive care whenever they need it and in many forms, not just face-to-face visits...access to care should be provided over the Internet, by telephone, and by other means."¹⁷ Electronic patient-centered communication, using e-mail or Web-based technology, has the potential to enhance physician-patient interactions by providing asynchronous, self-documenting communication of patient questions and physician advice.¹⁰ However, the utilization of physician-patient electronic communication is low, and physicians report concerns including excessive demands on their time and medicolegal risks.^{11,18-22}

Patient perceptions of the relative utility of electronic communication also may be important for incorporating this technology into clinical practice. To better understand patient factors that may influence the possible future of patient-physician electronic communication, we chose to explore the experiences of the early adopters of electronic communication, patients who already communicate with their physicians by electronic mail. Our research questions included the following:

- What are the characteristics of these early adopters of patient-physician e-mail?
- What topics do these patients address in e-mail to their providers?
- What do these patients perceive to be the benefits of and problems with e-mail communications?

Use of the Internet by patients is increasing.¹⁻⁶ In addition to seeking health information, individuals also can use the Internet to communicate with each other in online support groups,⁷⁻⁹ and can potentially use the Internet to communicate with their healthcare providers.^{1,10,11} In a survey of primary care patients who had Internet access, more than 80% wanted to use e-mail to communicate with their physician.¹² However, only 6% of patients have used e-mail to communicate with their healthcare provider.⁶

Effective physician-patient communication is important to patient satisfaction, treatment adherence, and

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To conduct this hypothesis-generating research, we used a combination of quantitative surveys and qualitative in-depth interviews with patients who currently communicate with their providers through the Internet.

METHODS

Study Design and Subjects

We conducted a cross-sectional study with data collected from 2 sources: (1) an Internet-based survey of patients who use the Internet to look for health information and (2) follow-up in-depth telephone interviews with patients. We targeted early adopters to search for what is currently working and not working with electronic patient-centered communication. The data collection for this study was part of a larger research project funded by the Bayer Institute for Healthcare Communication to explore the potential of patient-physician e-mail communication from the perspective of physicians and patients.¹

Recruitment Procedures

Use of electronic mail to communicate with physicians is still uncommon in the general population; therefore, recruiting patients for this study was a challenge. Because early adopters of e-mail with their physicians also would be likely to use the Internet to search for health information, we chose to recruit and survey patients who were using the Internet for this purpose.

A patient survey was developed and implemented online. After receiving approval from the Johns Hopkins Committee on Clinical Investigation, IntelliHealth.com, a health media company owned by Aetna US Healthcare and affiliated with Harvard Medical School, agreed to post a volunteer recruitment request. IntelliHealth has a popular consumer health information Web site available to any consumer searching for health information online. By collaborating with IntelliHealth, we hoped to have the widest possible visibility of our request for volunteers among our target population. A link to the survey also was posted on the consumer Web site of CareGroup Healthcare System, a Harvard-affiliated integrated health delivery network in the Boston area. The survey was available from May through October 2001. We confirmed that each response was from a unique IP address, thus lessening the chance that we had repeat users. After recruiting approximately 300 individuals who reported that they had used electronic mail to communicate with their physicians, we closed enrollment.

After the questionnaire portion of the study was completed, we asked participants who had used e-mail with their physicians whether they would agree to par-

ticipate in an in-depth telephone interview. Those who agreed entered their e-mail address onto the secure server. Initially, 6 patients were contacted by a research assistant through e-mail to schedule an in-depth telephone interview. These interviews were audiotaped and reviewed to identify themes. Based on the results of initial interviews, additional open-ended questions were added to the telephone interview. Additional audiotaped interviews were completed until preliminary review of tapes suggested that themes had been saturated. All interviews were transcribed verbatim.

Survey and Interview Content

The Internet-based survey included demographic questions (age, sex, ethnicity, level of education); health-related questions (general health status, number of medications, and number of visits to healthcare provider); and a screening question: "In a typical month, please estimate the average number of e-mails you send to your physician(s) and your physician's staff." To be inclusive, this screening question considered any e-mail to the physician practice. In our interviews, we asked those who responded to the Internet survey whether e-mail communication was with the physician or the physician's staff. Those who reported more than "none" were considered users of e-mail with their physician. Individuals who had used electronic mail with their physician were asked additional questions related to the physician's specialty; the clinical topics discussed through e-mail; the perceived benefits of e-mail and problems; and their overall satisfaction with e-mail communication with their physician. Clinical topics, benefits, and problems were picked from a list that was derived through an iterative process with input from all the authors (2 of whom have considerable clinical experience with patient e-mail) and then in pilot-testing with students at the Johns Hopkins School of Public Health.

We triangulated from the quantitative surveys using the in-depth telephone interviews. Interviewers asked a series of open-ended questions to guide the interviews, including: "How has e-mail with your physician helped you and your doctor manage your health conditions?" "Tell me about the most recent e-mail exchange you have had with your physician" "How is e-mail different than telephone contact?" We taught interviewers to probe for specific examples. Interviews averaged 15 to 20 minutes.

Analysis

We used Mantel-Haenszel χ^2 trend statistics to compare demographic characteristics and health status variables of individuals participating in our Internet-

based survey who had used electronic mail with their physicians with the characteristics and health status variables of those who reported not using e-mail with their healthcare providers. To further characterize this select sample of patients who used electronic mail with their physicians, we compared their demographic characteristics with those of participants in the 2000 Behavioral Risk Factor Surveillance Survey (BRFSS). The Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System is an ongoing, cross-sectional, state-based telephone survey conducted among a representative sample of each state's adult population. The purpose of this surveillance system is to collect uniform, population-based data on preventive health practices and risk behaviors that are linked to chronic diseases and injuries in the US population. Most states use either a disproportionate stratified sample or a Mitofsky-Waksberg-type sample design to draw a random sample from the set of all possible telephone numbers based on area codes and prefixes (www.cdc.gov/brfss/pdf/userguide.pdf). Thus, comparison data from the 2000 BRFSS survey were adjusted for the complex survey design.

Using descriptive statistics, we summarized the content of the patients' e-mails, perceived benefits, and potential concerns related to patient-physician e-mail. We measured the strength of the association between the level of satisfaction with electronic mail and the perceived impact on patients' medical care, concerns, and demographic characteristics using χ^2 tests and multivariable logistic regression.

Two authors independently identified distinct comments from the transcripts of the audiotaped interviews and together with a third author (MWJ), who has expertise in qualitative methodology, reviewed comments and developed domains and subdomains. Repeated or reworded comments representing the same thought by the same participant were counted only once. Any disagreement on whether a particular segment represented a unique thought or concept was adjudicated. Domains and subdomains were agreed on by consensus. Taxonomy of all comments was then sent to the remaining authors to be reviewed for relevance and consistency.

RESULTS

A total of 1881 individuals completed the Internet-based survey. Most were recruited from Intelihealth.com, with 88 (5%) recruited from the CareGroup site. Among the respondents, 311 (17%) reported using electronic mail with their physician(s) and/or physician's staff. Of these, 79 (25%) reported an average of more

than 1 e-mail per month to their healthcare provider, 69 (22%) reported at least 1 e-mail per month, and 164 (53%) reported less than 1 e-mail per month. We targeted individuals who reported communicating with their healthcare provider via e-mail 1 or more times per month to complete an in-depth telephone interview. A total of 56 telephone follow-up interviews were completed, containing 694 unique comments. Interviewees had similar education and were similar in age to the other 311 users, but were more frequently white (95% vs 82%; $P = .017$) and somewhat less frequently female (63% vs 78%; $P = .023$).

Demographic characteristics of survey participants and participants in the BRFSS are shown in **Table 1**. Respondents to our survey were twice as likely to have a college education, were younger, and were less frequently ethnic minorities than those who responded to the BRFSS. Similar to previous surveys of online health information seekers,²³ more respondents were female compared with the BRFSS participants. Also, participants in our survey more frequently reported fair/poor health (30% vs 16%). Compared with Internet survey respondents who reported not using e-mail with physicians, those respondents who had used e-mail with their physicians had higher levels of education (68% vs 52% were college educated) and more frequently reported taking medications (66% vs 58% took more than 1 medication; $P = .04$). Physicians to whom these patients sent e-mail messages included general internists ($n = 154$; 50%) and subspecialty internal medicine physicians ($n = 77$; 25%), family medicine physicians (9%), surgeons (9%), obstetricians/gynecologists (9%), pediatricians (3%), and others (23%).

Common Topics in E-mail With Physicians

Based on survey responses, a variety of topics were discussed in e-mail messages (**Table 2**). Among the 311 patients who used e-mail with their physicians, the most frequently reported topics were results of laboratory testing and prescription renewals (both reported by 85%). Messages focusing on new, nonurgent symptoms (73%) and nonurgent advice on medical conditions (49%) also were common. Topics reported infrequently by these 311 patients included urgent issues (chest pain, shortness of breath, suicidal thoughts; 21%) and sensitive issues (17%). The common topics were echoed in the comments collected in our patient interviews. Some representative topics are shown in **Table 3**.

Benefits of and Problems With Patient-physician E-mail

Overwhelmingly, among these 311 patients, the most common (95%) perceived benefit to e-mail communica-

Table 1. Demographic Characteristics of Respondents Who Use E-mail With Their Physician, Respondents Who Do Not Use E-mail With Their Physician, and the US Population*

Characteristic	US Population (n = 184 450)		Survey Respondents (n = 1881)	
	No.	%	No. [†]	%
Age, y				
18-29	32 154	22	233	13
30-45	62 302	33	627	34
46-60	46 483	24	672	36
>60	42 403	21	322	17
Sex				
Male	74 770	48	398	22
Female	109 680	52	1447	78
Race				
White	143 510	73	1641	90
African American	14 381	10	82	5
Other	25 403	17	83	5
College education				
No	131 225	72	810	44
Yes	53 225	28	1012	56
Health status				
Poor	8074	4	107	6
Fair	21 122	12	435	24
Good	53 545	30	939	52
Very good/excellent	101 357	55	329	18

*Demographic characteristics of the US population were taken from the 2000 Behavioral Risk Factor Surveillance Survey.

[†]The total number varies slightly due to missing values (less than 3%).

tion was that it was more efficient than the telephone (Table 2). Least common, but still reported by 40% of patients, was that it was a less intimidating forum to ask questions. In interviews, patients echoed this theme of e-mail being a less intimidating mode of communication through comments such as “[it’s] easier to talk about it with one step removed.” The overall taxonomy of benefits and problems, with example comments identified from the 56 patient interviews, is summarized in Table 3. Other major identified benefits included the ability to save e-mails to re-read instructions and improved communication because patients were better able to compose their questions, and physicians were more “articulate.”

Only 2 concerns reported on our survey approached 50%: “My physician may not answer” and “I am worried about bugging my physician too much” (Table 2). Confidentiality concerns, especially concerns about work or family, were reported by a minority of participants in

the survey, but were elicited as a major theme in the interviews, as exemplified by the comment: “[I] almost felt reluctant to do it [e-mail with physicians] because... what if the e-mail gets intercepted?” (Table 3). Another limitation to electronic mail reported by patients was a relative lack of empathy in physician e-mail responses.

Satisfaction With Patient-physician E-mail

Of the 311 patients who reported using e-mail with their physicians, 272 (87%) provided information on their satisfaction with e-mail communication. Of these 272 respondents, 82% (n = 222) were satisfied with the communication. In fact, more than 40% (n = 117) reported they would be willing to pay a fee per e-mail to have the service, with 60 patients reporting they would be willing to pay more than \$3.00 per e-mail. We could not identify any significant differences in sex, age, education, ethnicity, num-

ber of medications, or health status between those who were willing to pay and those who were not. However, those who were willing to pay were more frequent users of e-mail with their physician than those who used e-mail with their physician but were not willing to pay (35% vs 18% sent 2 or more e-mails per month; $P < .01$).

The majority of patients (78%, n = 213) reported that their physician had responded to between 75% and 100% of their e-mail messages, but 13% reported that a physician responded to fewer than 25% of their e-mails. Those who reported that their physician always responded to their e-mail messages were more frequently satisfied (93% vs 52%; $\chi^2 = 64$ [$df = 1$]; $P < .001$). After adjustment for patient age, sex, race, education level, self-rated health, their physician’s specialty, and number of e-mail messages per month by using logistic regression, patients who reported that their physician always responded were more likely to be satisfied (odds ratio = 15.9; 95% confidence interval = 7.0, 36.2) than those

who reported that their physician responded less than 100% of the time. Satisfaction was not associated with demographic characteristics, health status, or average number of e-mail messages with physician per month.

DISCUSSION

The experiences of these patients who were early adopters of electronic communication with their physician were quite positive. The most frequent benefits from these patients' perspective were related to the efficiency of communication, as evidenced by a comment obtained during our interviews: "I think it is good, rather than playing telephone tag or dealing with front desk people who don't necessarily get the messages relayed." The frequently reported topics related to administrative issues (refills, appointments, laboratory results) are easily handled in an asynchronous manner and may be ideal for electronic communication.

Another clear, although less frequent, benefit reported was that e-mail was a less intimidating venue for communication. Previous research in understanding peer-to-peer communication on Internet disease-related message boards supports the theory that communicating online creates a "relative anonymity" and this allows some level of disinhibition for patients to ask questions they may not have otherwise.⁷

Our study significantly adds to the literature by specifically targeting the experiences of early adopters of electronic communication, and by triangulating quantitative survey data with qualitative data. Previous research has clearly documented patients' desire for

Table 2. Common Topics, Perceived Benefits, and Barriers in Patient-physician E-mail Communications Reported on Internet-based Survey by 311 Patients Who Used E-mail With Their Physician

Survey Results	No.	%
Common topics		
Results of laboratory testing	265	85
Prescription renewals	265	85
New, nonurgent symptoms (eg, cold, rash, back pain)	228	73
Routine referral requests	223	72
Routine appointment scheduling	182	59
Nonurgent advice on medical conditions (eg, hypertension, high cholesterol)	153	49
Questions regarding billing, insurance, medical claims	120	39
Medical information on the Internet	101	32
Nonurgent advice on psychiatric conditions	82	26
Urgent issues (eg, chest pain, shortness of breath, suicidal ideation)	66	21
Sensitive issues (eg, HIV testing, impotence)	52	17
Work-related injuries or disabilities	47	15
Perceived benefits		
More efficient than telephone	295	95
Communicate without a face-to-face appointment	241	77
Improves the advice my physician provides	158	51
Less intimidating forum to ask questions	123	40
Concerns		
My physician may not answer my e-mails	157	50
I am worried about bugging my physician too much	147	47
I am concerned about confidentiality or privacy	129	41
E-mail may decrease the face-to-face contact with physician	68	22
My physician may misinterpret what I write in the message	61	20
My boss may be able to see my e-mails	51	16
Messages to my doctor might be seen by my family	16	5

electronic communication with providers.¹² However, these studies have surveyed patients who have not yet begun to use e-mail with their providers.^{12,24}

This study identified 1 specific risk of electronic communication between physician and patient. A noticeable subgroup of our participants who had used e-mail to communicate with their physician (21%) reported using e-mail for urgent matters such as chest pain or suicidality. The American Medical Informatics Association (AMIA) guidelines suggest that e-mail should not be used for emergencies or other time-sensitive issues.¹⁰ Some physicians have expressed concern that patients may not be able to distinguish between emergencies and routine issues. Because these serious concerns were self-reported, however, patients did seem to understand that

Table 3. Summary of Results of 56 Patient Interviews

<p>Specific Examples of Topics in Patient-provider E-mail</p> <ul style="list-style-type: none"> • Primary care doctor...[and] nurse practitioner for my diabetes, we e-mail my [blood sugar] numbers back and forth. • Take my blood pressure every once in a while and log this, and once in a while I will e-mail him updates. • Rash, and I wondered whether the medication would work. • My husband has a fungal infection, e-mailed how he should take the pills. • For my husband...he felt like he had a prostate problem. • Yes; with this switch of my doctor; sent him a history of medications on e-mail. • The most recent was...asking for an interpretation of a test result. <p>Taxonomy of Reported Benefits and Barriers</p> <p>I. Perceived benefits</p> <p>a. Improved communication</p> <ul style="list-style-type: none"> • "Before, the only real way I could communicate personally with my doctor was by making an appointment. It was very difficult to contact them by phone and with e-mail I can actually have an intelligent dialogue." • "More articulate and thoughtful in describing, more thorough in terms of any instructions I have gotten." • "[I'm able to better] compose my questions...." • "Opportunity to read [doctor's response] at leisure." • "No waiting by phone and assured response, no middleman." • "Prescription refills easier: Viagra, glucose strips." <p>b. More comfortable</p> <ul style="list-style-type: none"> • "Easier to talk about it with one step removed." • "Yes, [for] checking/reaffirming problems/concerns." • "Face to face is best, but [choose] e-mail over telephone." • "Little embarrassing over the telephone, especially if you are at work, people are around." <p>c. Save e-mails (record of communication)</p> <ul style="list-style-type: none"> • "I liked the e-mail because I print a copy out." • "Easier to get proof of vaccinations and tests." <p>II. Problems</p> <p>a. Privacy</p> <ul style="list-style-type: none"> • "Emotional, sexual or information that an insurance company should they ever intercept my e-mail [would be] very sensitive information." • "Would not feel comfortable with addressing sensitive issues, my work e-mail, not be the only person." • "Almost felt reluctant to do it because what if the e-mail gets intercepted." <p>b. Lack of empathy, caring, and concern in e-mail</p> <ul style="list-style-type: none"> • "Don't get the right emphasis, [doctor was] a little rude." • "A little dry, but took the trouble of answering." <p>c. Not happy with e-mail</p> <ul style="list-style-type: none"> • "Wanted immediate response and didn't get it." • Yes, he couldn't be bothered, by tone of follow-up."

nature. Providers might not check their e-mail for hours, or even days. Thus, if electronic methods of communication between physician and patient do continue to increase, it is critically important that physicians educate patients about appropriate use of this medium.

Although we were successful in identifying a group of patients who had experience using e-mail with their physicians, a limitation of our study is that it was based on a convenience sample of patients responding to an Internet-based survey. We have attempted to compare our sample with data from the population-based BRFSS to characterize the biases of selection as much as possible. Unfortunately, 1 limitation of using the BRFSS as a comparison group is that the number of variables available for comparison was limited. Thus, we were not able to

they were emergencies. Either way, it would seem that patients are not being educated properly about the appropriate use of electronic messaging. The AMIA and other guidelines state that patients need to be educated and frequently reminded about the rules of use, and a mention of this education be documented in the medical record.¹⁰ The asynchronous nature of electronic mail is not amenable to communications of an urgent

compare factors such as amount of Internet or e-mail use. However, patients who responded to our survey did report a higher level of education, were more frequently female, and were of younger age compared with the BRFSS respondents. In fact, patients who reported using e-mail with physicians were even more educated than other Internet users who did not use e-mail with physicians. Our respondents also had higher rates of

fair/poor health status compared with respondents to the BRFSS.

These differences echo the disparities in Internet access termed the digital divide.^{25,26} If, in the vision of the Institute of Medicine, the Internet is co-opted to increase patient-provider communication in the hopes of improving the quality of care, and access is not available for many, the result may be an increase in health disparities. In fact, the importance of the digital divide has been acknowledged in Healthy People 2010, where “to increase Internet access to 80% of the US population” is included as a measurable health objective.²⁷ Although we have not achieved this goal, there is evidence that the digital divide is narrowing. A recent Forrester Research study indicated that the majority of the medically uninsured now have a computer and Internet access at home and go online at least once a month (www.forrester.com/ER/Research/DataSnapshot/Excerpt/0,1317,32374,00.html).

Our participants also were different from respondents to previous surveys of online health information seekers. Specifically, fewer than half (41%) of our users of e-mail with physicians reported being concerned about the privacy of their e-mails. In a previous survey by the Pew Internet and American Life Project, more than 70% of Internet health information seekers were “very concerned” about online privacy.²³ This difference may represent a misperception that e-mail is more private than information provided online. However, it also may suggest another difference between these early adopters and the general population of online health information seekers.

Using the perspective of diffusion of innovation,²⁸ patient desire for electronic communication with physicians and the perceived advantage over telephone communication, especially for chronic disease management issues, may facilitate the eventual adoption of this technology. Thus, patient demand, combined with changes in policy derived from the recent Institute of Medicine reports, may increase use of electronic communication between physicians and patients, especially if confidentiality concerns can be overcome by using more secure, Web-based technology.^{11,29}

Overall, patient satisfaction with primary care clinical services, especially related to physician-patient communication, has declined in recent years.³⁰ Electronic communication is potentially a valuable service physicians could use to increase patient satisfaction with care. Certainly these early adopters of electronic patient-centered communication seemed to have derived benefit from their e-mail exchanges. Early adopters were overwhelmingly satisfied and probably will communicate this satisfaction to their peers. In

fact, a subgroup of these users, who were actually the most frequent users of e-mail with their physicians, would be willing to pay a fee of up to \$3.00 per message to send e-mail to their providers. These data are valuable within the context of the growing number of insurers who are or are considering reimbursing physicians for electronic patient-centered communication.³¹

As we noted, patient satisfaction with electronic communication is intimately linked with the experience that physicians will respond. Patients who reported that their physician did not always respond were less satisfied. Previous reports also have indicated that patients have concerns about lost messages or delayed responses.³² As younger patients who are even more e-mail savvy develop more chronic diseases, many more patients are likely to want to use electronic communication with their physician, potentially increasing the volume of messages. Currently, physicians who are early adopters of e-mail with patients report that they use e-mail only with a small percentage of their patients.¹ As volume increases, physicians may have difficulty responding to all patient e-mail messages. Our patient participants are concerned about this, as evidenced by concerns about “bugging the physician too much.”

Insurance payment or capitation arrangements might increase physician willingness to respond. Triage methods (ie, using staff to read e-mails and thus incorporating electronic communication more efficiently into the work flow of the practice) also may be necessary.³² However, our early-adopter patients seem to value being able to communicate directly with their doctors. Using staff to read patient e-mails first may require more discussion of privacy issues with patients and create a significant barrier to use of e-mail. Future research might compare the perceived value and relative use of physician-directed and triage-based electronic communication from the patient and provider perspectives.

In conclusion, patients in our study preferred the efficiency of using electronic communication for administrative issues. Thus, we might speculate that e-mail between physicians and patients may be more frequently used and more valuable in chronic disease populations for whom prescription refills, appointments, and laboratory tests are most frequent, rather than more general, healthy populations with intermittent illnesses requiring diagnostic evaluation. In fact, physicians who are early adopters of e-mail with patients frequently report using e-mail with their patients who have chronic diseases.¹ Further research is needed to understand the dynamics involved in integrating electronic communication with patients into

providers' clinical practice. Future interventions designed to increase use of electronic communication between physician and patient should consider the target patient population, investigate reimbursement strategies for providers, and explore whether the patients are willing to pay for this service.

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